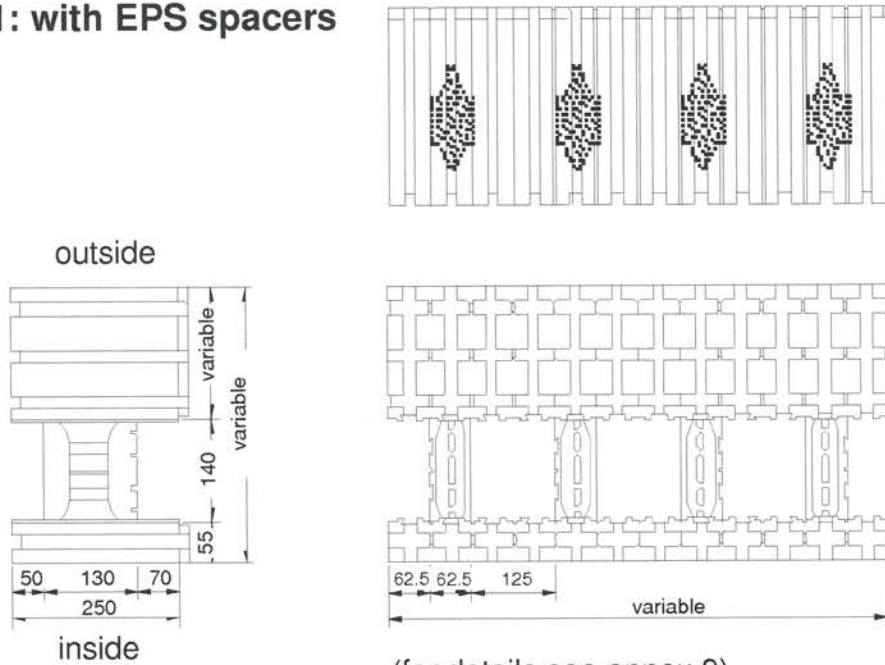
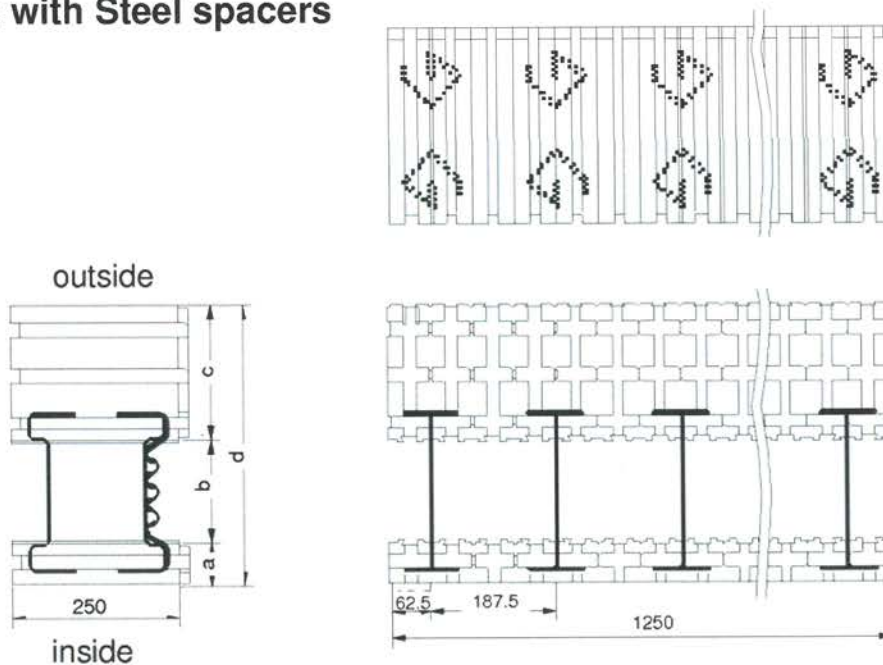


Type 1: with EPS spacers



(for details see annex 2)

Type 2: with Steel spacers



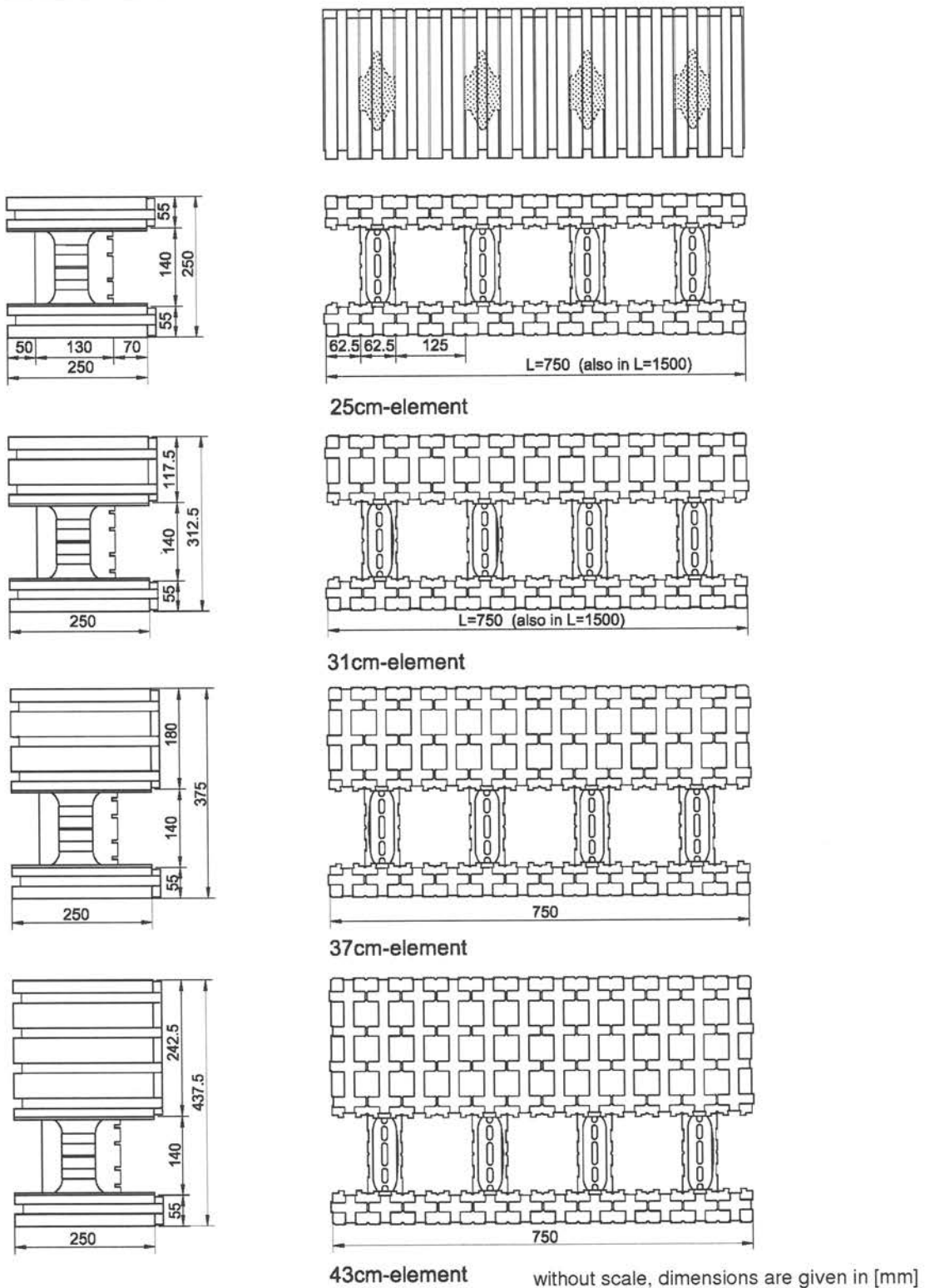
(for details see annex 3)

without scale, dimensions are given in [mm]

ISORAST

Overview of the standard shuttering elements with
EPS spacers (Type 1) respectively wire spacers (Type 2)
(Schematic description of shuttering elements made of EPS)

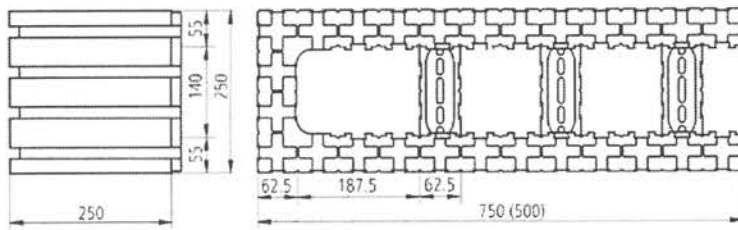
Annex 1



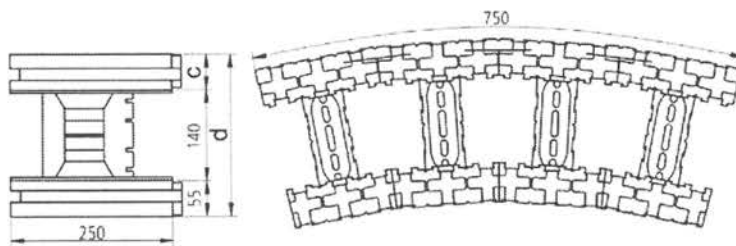
ISORAST

Standard shuttering elements with EPS spacers (Type 1)
Thickness of the concrete core 140 mm

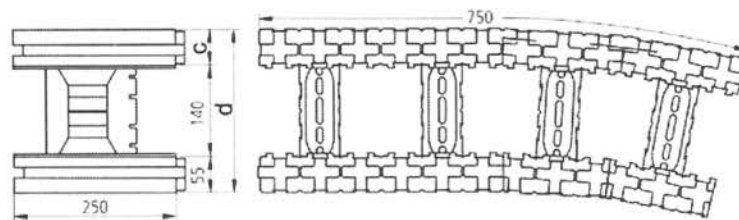
Annex 2.1



25cm-interior wall end element



Arch element



Arch connection element

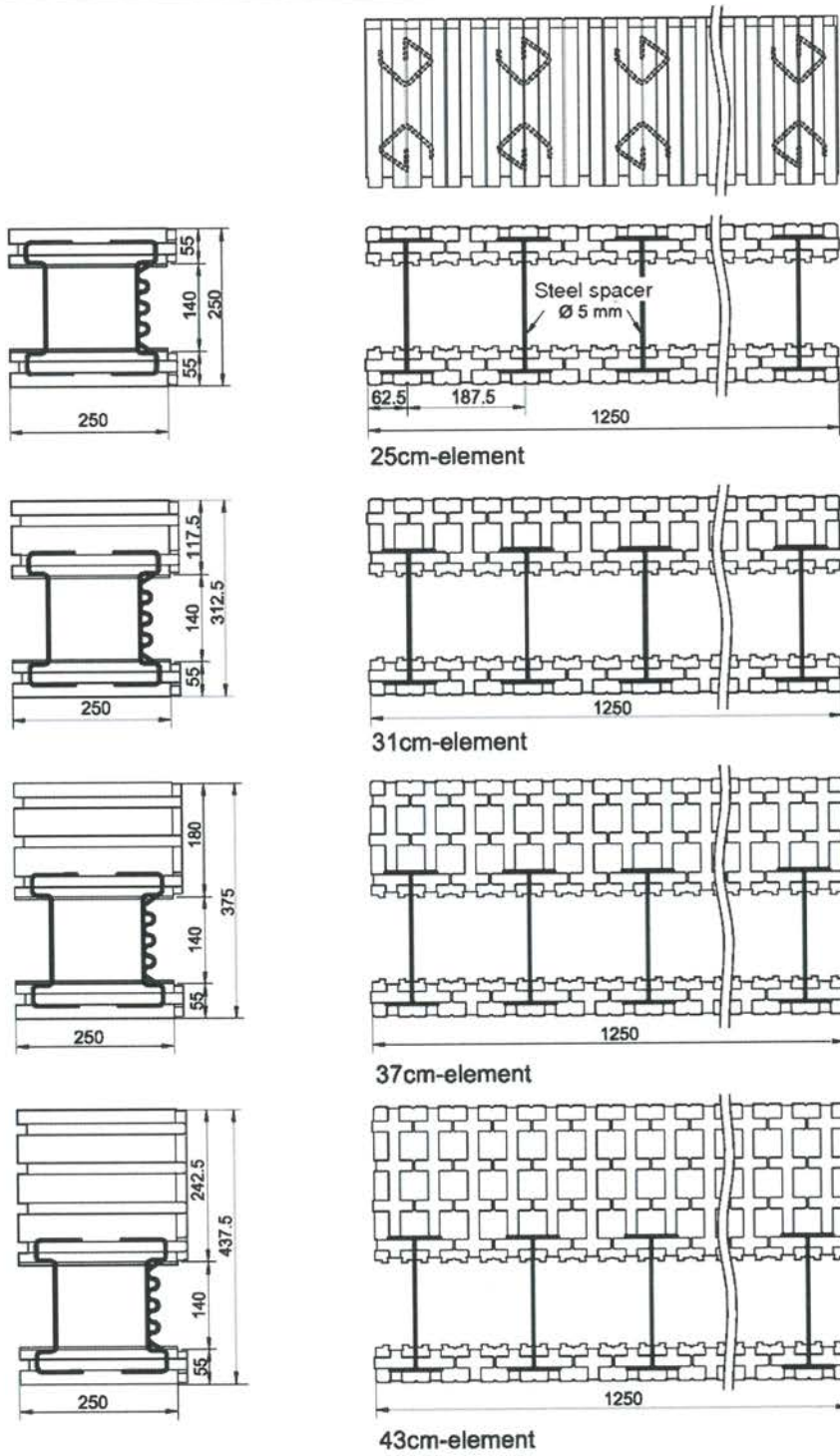
| Type | c [mm] | d [mm] |
|------------------------------|--------|--------|
| 25cm-arch element | 55.0 | 250.0 |
| 25cm-arch connection element | | |
| 31cm-arch element | 117.5 | 312.5 |
| 31cm-arch connection element | | |
| 37cm-arch element | 180.0 | 375.0 |
| 37cm-arch connection element | | |
| 43cm-arch element | 242.5 | 437.0 |
| 43cm-arch connection element | | |

without scale, dimensions are given in [mm]

ISORAST

Special shuttering elements with EPS spacers (Type 1):
Interior wall end elements, Arch elements and Arch connection elements

Annex 2.2

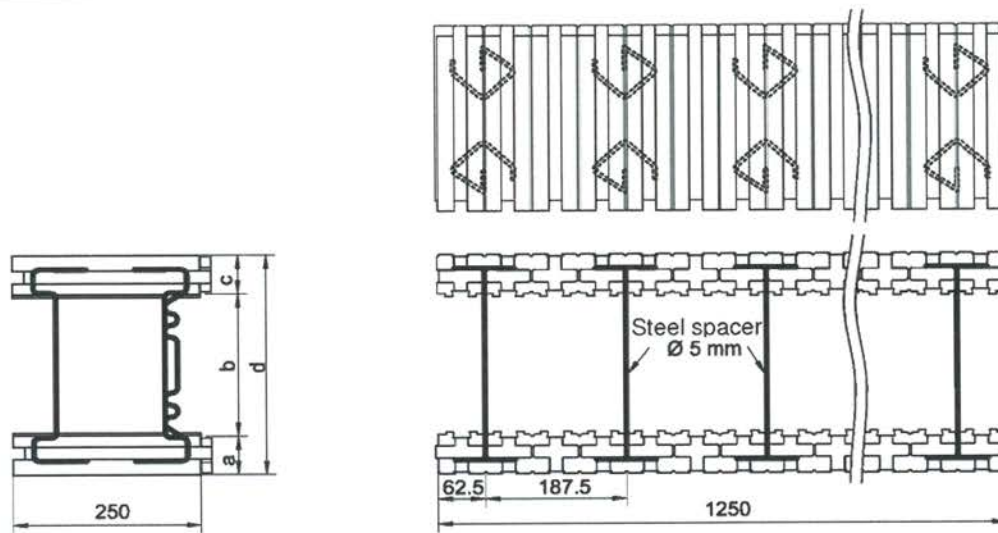


without scale, dimensions are given in [mm]

ISORAST

Standard shuttering elements with wire spacers (Type 2)
Thickness of the concrete core 140 mm

Annex 3.1



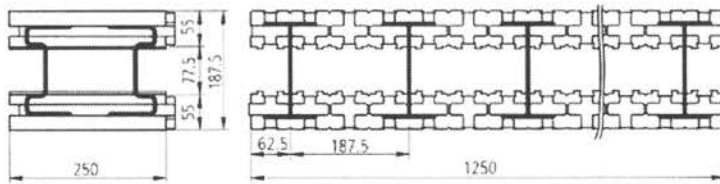
| Type | a [mm] | b [mm] | c [mm] | d [mm] |
|----------------------|--------|--------|--------|--------|
| Type 2 / 055-203-055 | 55.0 | 202.5 | 55.0 | 312.5 |
| Type 2 / 055-203-118 | 55.0 | 202.5 | 117.5 | 375.0 |
| Type 2 / 055-203-180 | 55.0 | 202.5 | 180.0 | 437.5 |
| Type 2 / 055-203-243 | 55.0 | 202.5 | 242.5 | 500.0 |
| Type 2 / 055-265-055 | 55.0 | 265.0 | 55.0 | 375.0 |
| Type 2 / 055-265-118 | 55.0 | 265.0 | 117.5 | 437.5 |
| Type 2 / 055-265-180 | 55.0 | 265.0 | 180.0 | 500.0 |
| Type 2 / 055-265-243 | 55.0 | 265.0 | 242.5 | 562.5 |

without scale, dimensions are given in [mm]

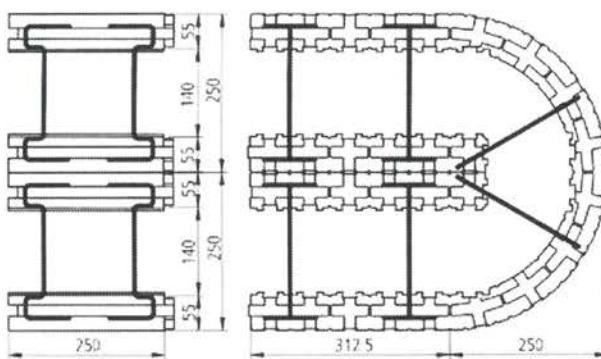
ISORAST

Standard shuttering elements with wire spacers (Type 2)
Thicknesses of the concrete core 202,5 mm and 265 mm

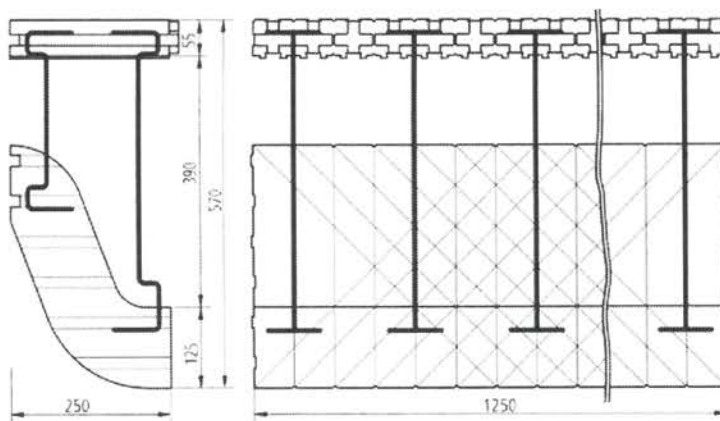
Annex 3.2



18cm-interior wall element



25cm-curved edge element



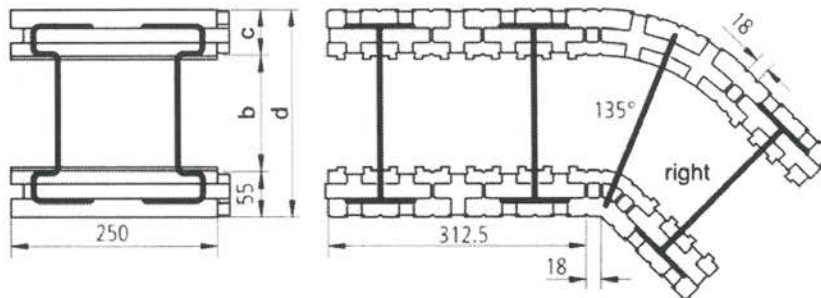
Cantilever element

without scale, dimensions are given in [mm]

ISORAST

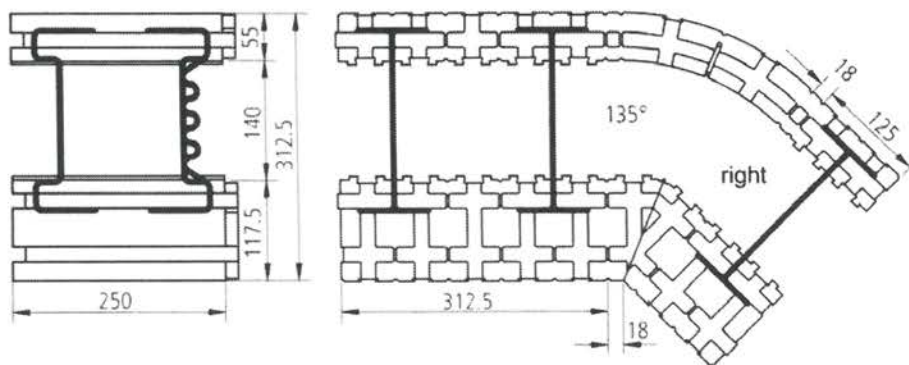
Special shuttering elements with wire spacers (Type 2):
Interior wall elements, Curved edge elements and Cantilever elements

Annex 3.3



Oriel element, left and right

| Type | b [mm] | c [mm] | d [mm] |
|------------------------|--------|--------|--------|
| 25cm-oriel element | 140.0 | 55.0 | 250.0 |
| 31cm-oriel element | 140.0 | 117.5 | 312.5 |
| 37cm-oriel element | 140.0 | 180.0 | 375.0 |
| 43cm-oriel element | 140.0 | 242.5 | 437.0 |
| 31cm/202-oriel element | 202.5 | 55.0 | 312.5 |
| 37cm/202-oriel element | 202.5 | 117.5 | 375.0 |
| 43cm/202-oriel element | 202.5 | 180.0 | 437.5 |



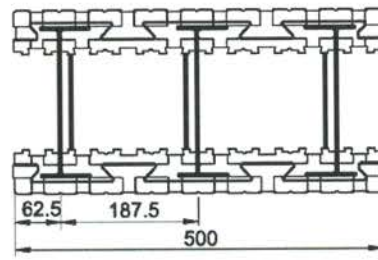
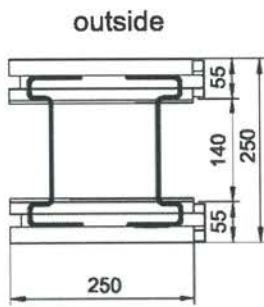
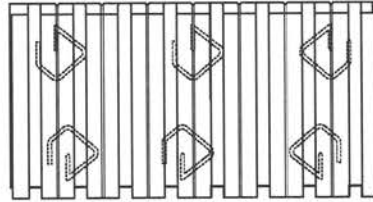
31cm-interior oriel element, left and right

without scale, dimensions are given in [mm]

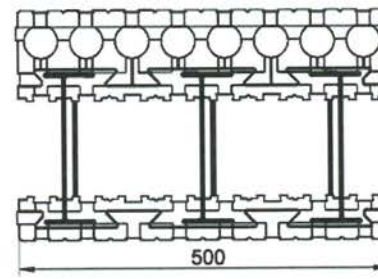
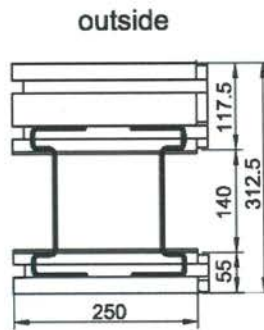
ISORAST

Special shuttering elements with wire spacers (Type 2):
Oriel elements

Annex 3.4



25cm acoustic element



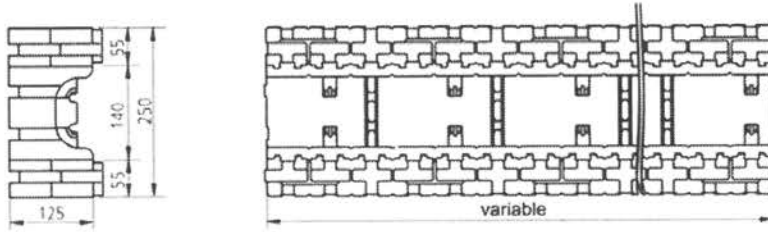
31cm super acoustic element

without scale, dimensions are given in [mm]

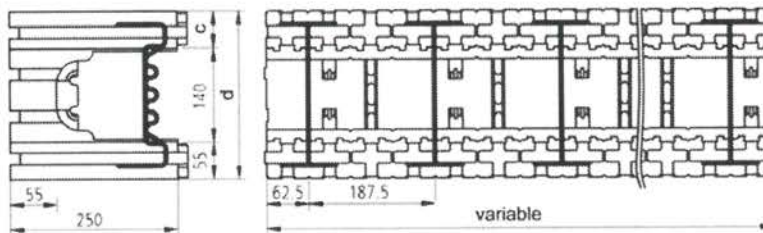
ISORAST

Shuttering elements with increased sound absorption

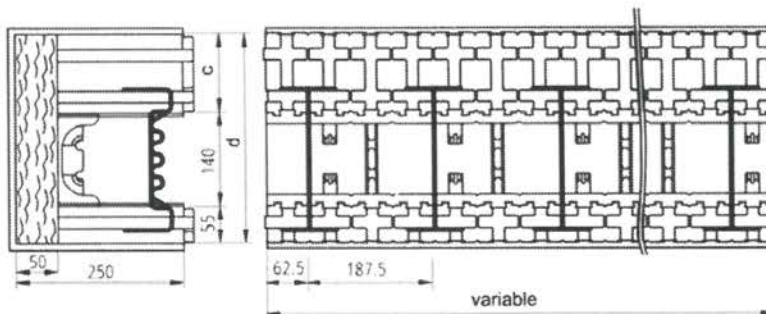
Annex 4



Interior door lintel element



Lintel element



Lintel element "S"

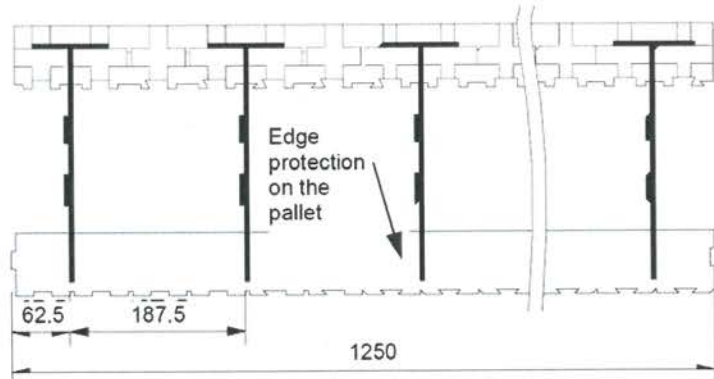
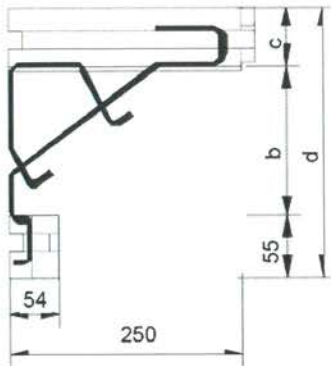
| Type | c [mm] | d [mm] |
|-------------------------|--------|--------|
| 25cm-lintel element | 55.0 | 250.0 |
| 31cm-lintel element | 117.5 | 312.5 |
| 31cm-lintel element „S“ | | |
| 37cm-lintel element | 180.0 | 375.0 |
| 37cm-lintel element „S“ | | |
| 43cm-lintel element | 242.5 | 437.0 |
| 43cm-lintel element „S“ | | |

without scale, dimensions are given in [mm]

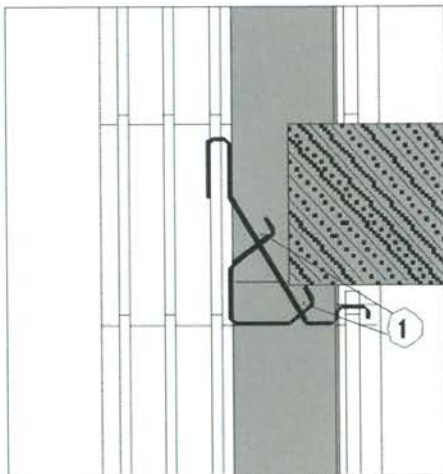
ISORAST

Special elements:
Interior door lintel elements and Lintel elements

Annex 5



| Type | b [mm] | c [mm] | d [mm] |
|-----------------------------|--------|--------|--------|
| 25cm-floor edge element | 140.0 | 55.0 | 250.0 |
| 31cm-floor edge element | 140.0 | 117.5 | 312.5 |
| 37cm-floor edge element | 140.0 | 180.0 | 375.0 |
| 43cm-floor edge element | 140.0 | 242.5 | 437.5 |
| 31cm/202-floor edge element | 202.5 | 55.0 | 312.5 |
| 37cm/202-floor edge element | 202.5 | 117.5 | 375.0 |
| 43cm/202-floor edge element | 202.5 | 180.0 | 437.5 |
| 50cm/202-floor edge element | 202.5 | 242.5 | 500.0 |



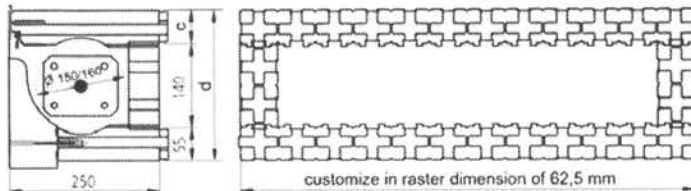
Side view of floor edge elements

without scale, dimensions are given in [mm]

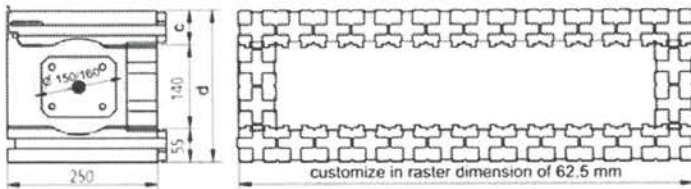
ISORAST

Special elements:
Floor edge elements

Annex 6

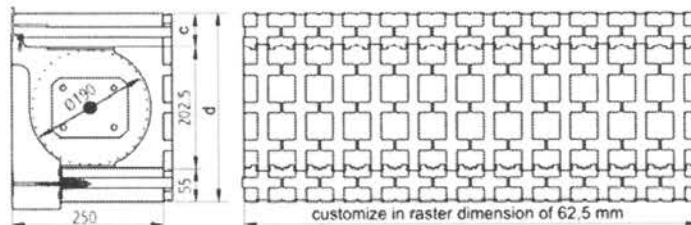


Roller jalousie housing „Ri“
(interior inspection)

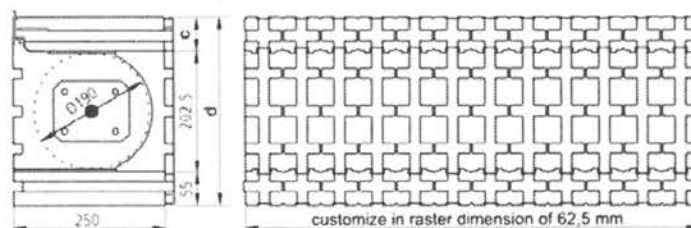


Roller jalousie housing „Ra“
(exterior inspection)

| Type | c [mm] | d [mm] | Interior diameter [mm] |
|--|--------|--------|------------------------|
| 25cm-roller jalousie housing „Ri“, ø 150 | 55.0 | 250.0 | 150.0 |
| 25cm-roller jalousie housing „Ra“, ø 150 | | | |
| 31cm-roller jalousie housing „Ra“, ø 150 | 117.5 | 312.5 | 160.0 |
| 37cm-roller jalousie housing „Ra“, ø 160 | 180.0 | 375.0 | |
| 43cm-roller jalousie housing „Ra“, ø 160 | 242.5 | 437.5 | |



Roller jalousie housing „Ri“
(interior inspection)



Roller jalousie housing „Ra“
(exterior inspection)

| Type | c [mm] | d [mm] | Interior diameter [mm] |
|--|--------|--------|------------------------|
| 31cm-roller jalousie housing „Ri“, ø 190 | 55.0 | 312.5 | 190 |
| 31cm-roller jalousie housing „Ra“, ø 190 | | | |
| 37cm-roller jalousie housing „Ri“, ø 190 | 180.0 | 375.0 | |
| 37cm-roller jalousie housing „Ra“, ø 190 | | | |
| 43cm-roller jalousie housing „Ri“, ø 190 | 242.5 | 437.5 | |
| 43cm-roller jalousie housing „Ra“, ø 190 | | | |

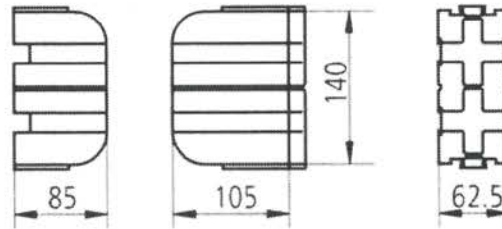
without scale, dimensions are given in [mm]

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Special elements:
Roller shutter box elements

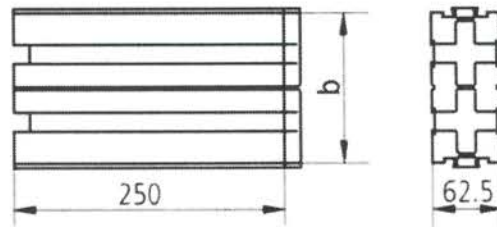
Annex 7

Type 1: with EPS spacers



Type 1 / 140-end element

Type 2: with Steel spacers



Type 2 / End element

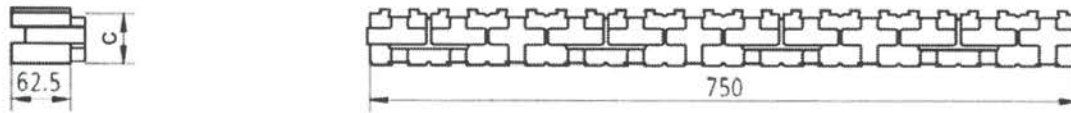
| Type | b [mm] |
|-------------------------|--------|
| Type2 / 77-end element | 77.5 |
| Type2 / 140-end element | 140.0 |
| Type2 / 202-end element | 202.5 |
| Type2 / 265-end element | 265.0 |

without scale, dimensions are given in [mm]

ISORAST

Accessory parts:
End stops with EPS spacers (Type 1) respectively wire spacers (Type 2)

Annex 8



Height adjuster element

| Type | c [mm] |
|------------------------------|--------|
| Height adjuster element | 55.0 |
| 43cm-height adjuster element | 242.5 |



Oriel/curved edge height adjuster element

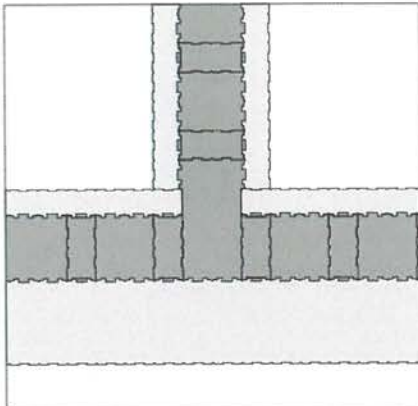
| Type | c [mm] |
|--|--------|
| 25cm-oriel/curved edge height adjuster element | 55.0 |
| 31cm-oriel height adjuster element | 117.5 |
| 37cm-oriel height adjuster element | 180.0 |
| 43cm-oriel height adjuster element | 242.5 |

without scale, dimensions are given in [mm]

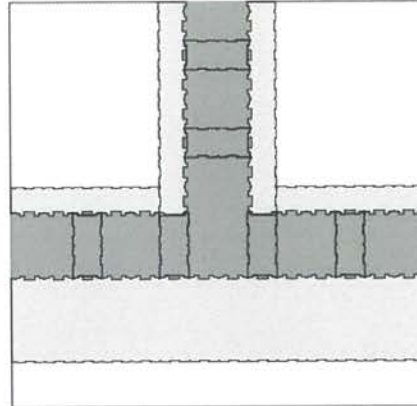
ISORAST

Accessory parts:
Straight height adjuster pieces and
Height adjuster pieces for oriel elements and curved edge elements

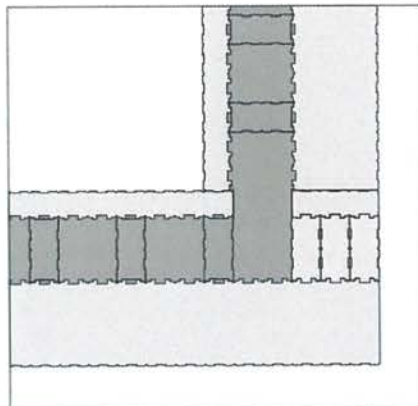
Annex 9



T-connection: 1. layer



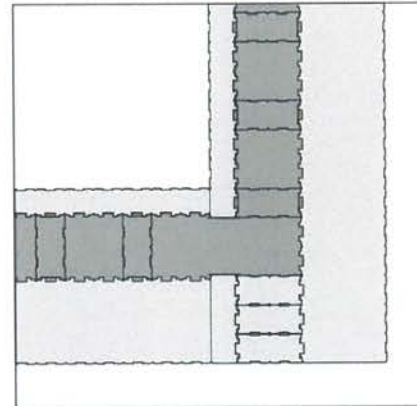
2. layer



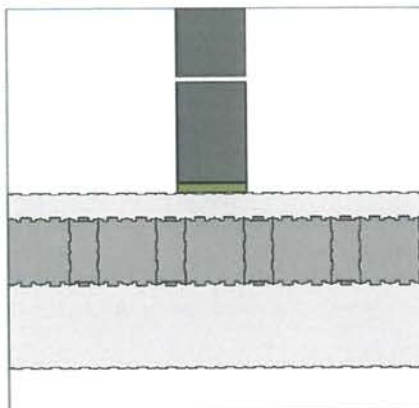
Corner connection: 1. layer

Hint:

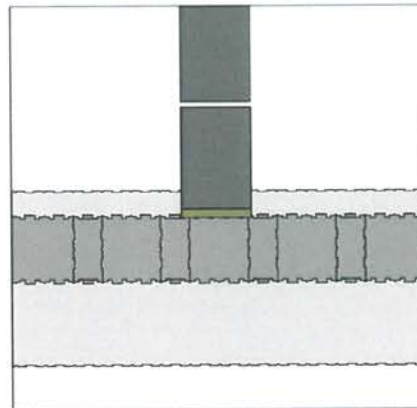
- always put wires on top of each other



2. layer



Masonry not fixed with concrete



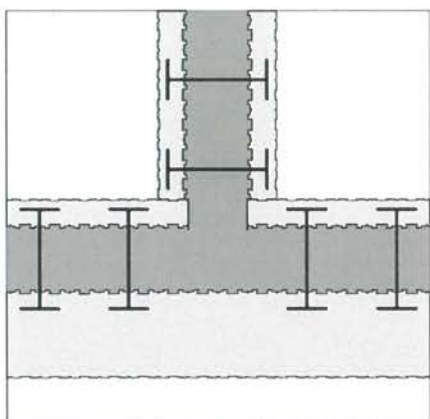
Masonry fixed with concrete

without scale

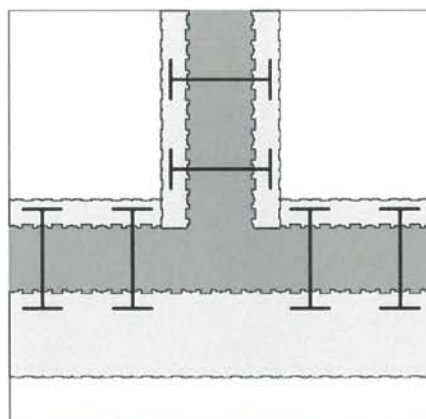
ISORAST

Rectangular corners and typical wall junctions of shuttering elements with
EPS spacers (Type 1)

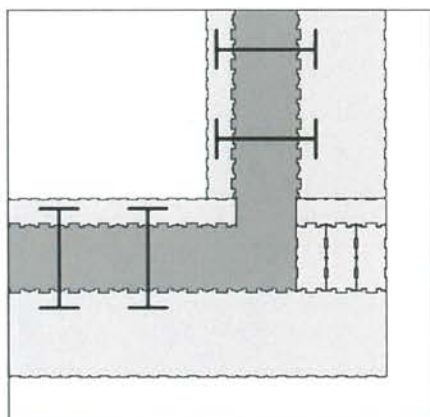
Annex 10



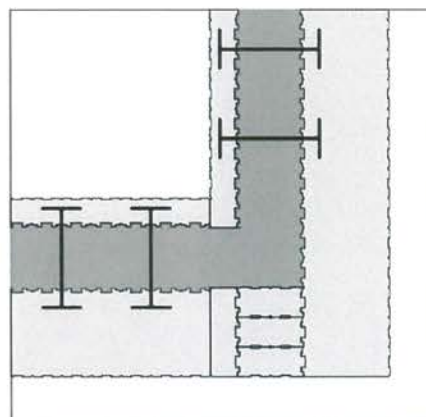
T-connection: 1. layer



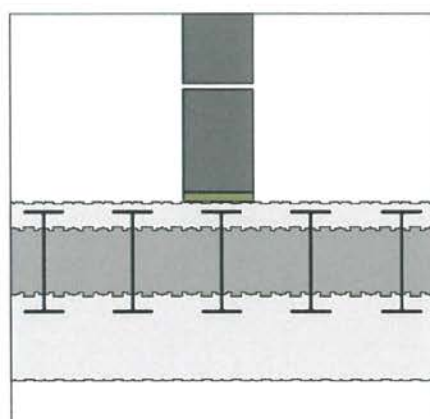
2. layer



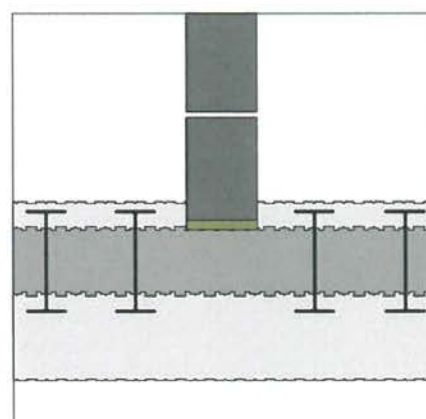
Corner connection: 1. layer



2. layer



Masonry not fixed with concrete



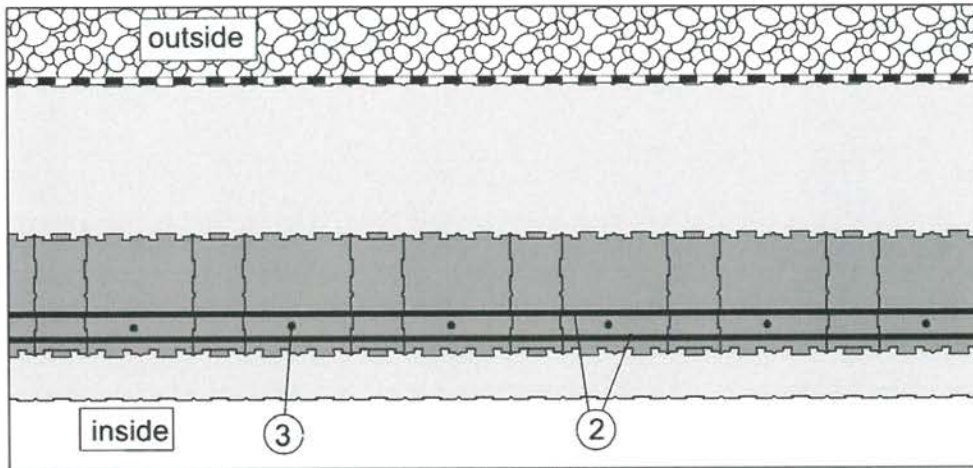
Masonry fixed with concrete

without scale

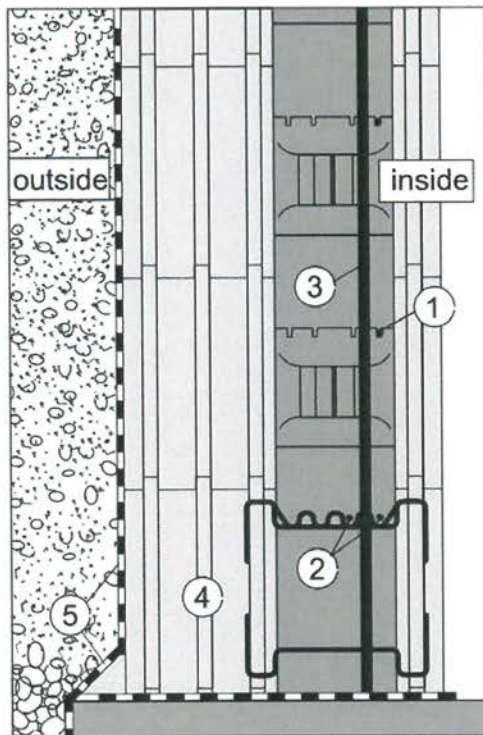
ISORAST

Rectangular corners and typical wall junctions of shuttering elements with wire spacers (Type 2)

Annex 11



Cross section of an exterior basement wall with reinforcement according to static calculation



Vertical cut

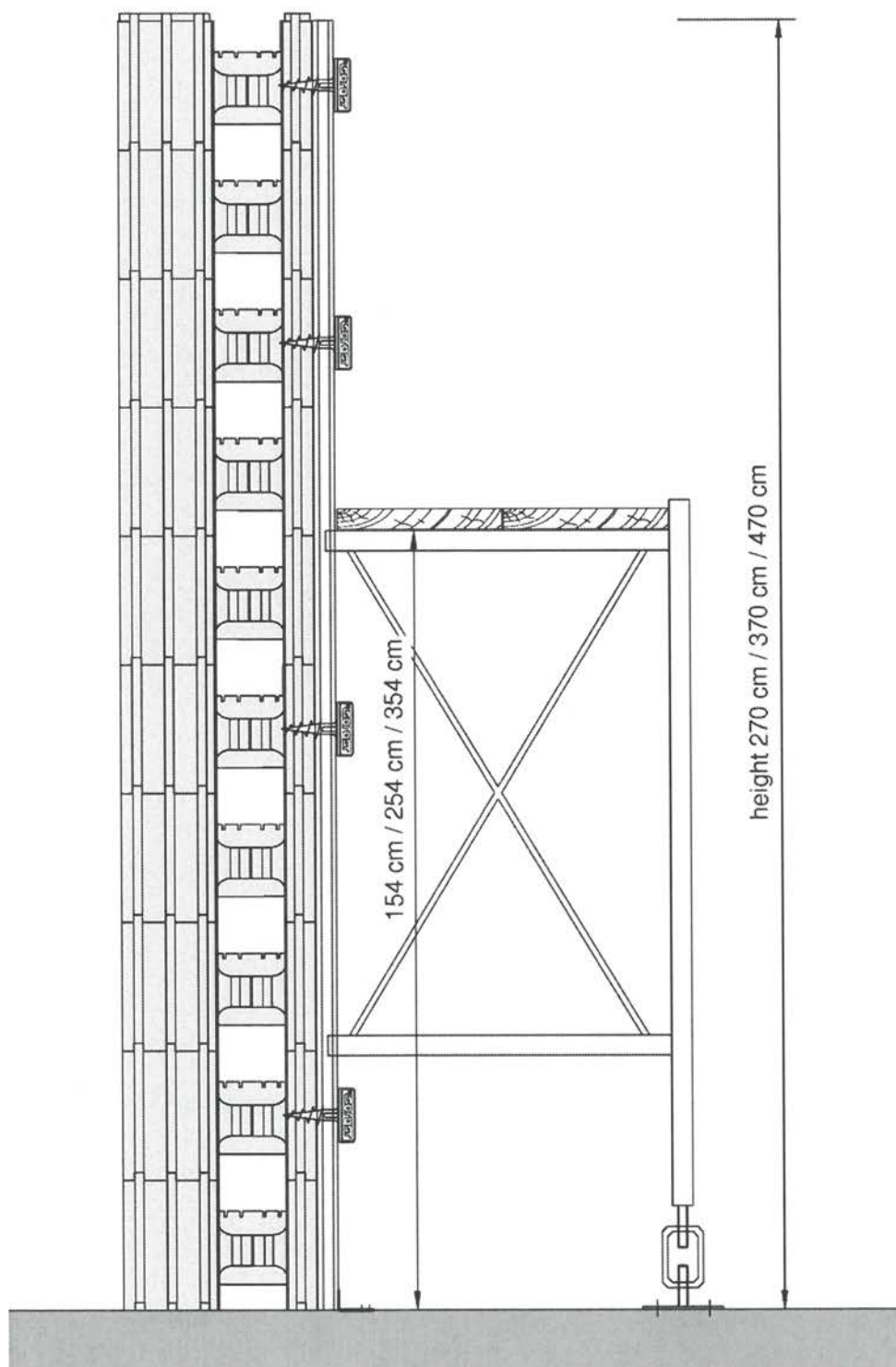
- ① Transverse reinforcement, according to static calculation
- ② Transverse reinforcement in 1st, 5th and last row twice for fixation.
- ③ Vertical reinforcement, according to static calculation
- ④ Bottom row with steel spacers
- ⑤ Wall sealing

without scale

ISORAST

Possible reinforcement of external walls of basements made of shuttering elements with EPS spacers (Type 1) respectively wire spacers (Type 2)

Annex 12



distance between supports: maximum 1.50 m

without scale, dimensions are given in [cm]

ISORAST

Mounted push pull props

Annex 13

| Type | | according to Annex | Thickness of the wall | Thickness of the concrete core | Area of concrete core per meter wall length | Assumed weight of the shuttering elements without rendering $\rho_{EPS} = 30 \text{ kg/m}^3$ | Assumed weight of the shuttering elements in end use conditions (with concrete core without rendering) $\rho_{Concrete} = 25 \text{ kN/m}^3$ | Area of horizontal concrete ribs A_R |
|---|---------------|--------------------|-----------------------|--------------------------------|---|--|--|--|
| | | | [cm] | [cm] | [m ² /m] | [kN/m ²] | [kN/m ²] | [cm ²] |
| EPS (Type 1) | 25 cm-Element | 2 | 25,00 | 14,00 | 0,0933 | 0,038 | 3,12 | 154 |
| | 31 cm-Element | | 31,25 | | 0,0933 | 0,057 | 3,14 | 154 |
| | 37 cm-Element | | 37,50 | | 0,0933 | 0,076 | 3,15 | 154 |
| | 43 cm-Element | | 43,75 | | 0,0933 | 0,094 | 3,17 | 154 |
| Wire (Type 2) | 25 cm-Element | 3 | 25,00 | 14,00 | 0,1363 | 0,064 | 3,56 | -- |
| | 31 cm-Element | | 31,25 | | 0,1363 | 0,083 | 3,58 | -- |
| | 37 cm-Element | | 37,50 | | 0,1363 | 0,102 | 3,60 | -- |
| | 43 cm-Element | | 43,75 | | 0,1363 | 0,120 | 3,62 | -- |
| | 055-203-055 | 31,25 | 20,25 | 0,1988 | 0,068 | 5,13 | -- | |
| | 055-203-118 | 37,50 | | 0,1988 | 0,087 | 5,15 | -- | |
| | 055-203-180 | 43,75 | | 0,1988 | 0,106 | 5,17 | -- | |
| | 055-203-243 | 50,00 | | 0,1988 | 0,124 | 5,19 | -- | |
| | 055-265-055 | 37,50 | 26,50 | 0,2613 | 0,072 | 6,70 | -- | |
| | 055-265-118 | 43,75 | | 0,2613 | 0,091 | 6,72 | -- | |
| | 055-265-180 | 50,00 | | 0,2613 | 0,110 | 6,74 | -- | |
| | 055-265-243 | 56,25 | | 0,2613 | 0,128 | 6,76 | -- | |
| ISORAST | | | | | | | | Annex 14 |
| Thickness of the wall and weight per m ² of standard shuttering elements | | | | | | | | |

| standards and guidelines | | issue | title |
|----------------------------------|----------|----------------|--|
| EN | 206-1 | 2000 | Concrete - Part 1: Specification, performance, production and conformity |
| EN | 1992-1-1 | 2004 + AC:2010 | Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings |
| EN | 13163 | 2012 | Thermal insulation products for buildings - Factory made products of expanded polystyrene (EPS) - Specification |
| EN | 13501-1 | 2007 + A1:2009 | Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests |
| EN | 13501-2 | 2007 + A1:2009 | Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services |
| EN ISO | 717-1 | 1996 + A1:2006 | Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation |
| EN ISO | 6946 | 2007 | Building components and building elements - Thermal resistance and thermal transmittance - Calculation method |
| EN ISO | 10456 | 2007 + AC:2009 | Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values |
| EN ISO | 13788 | 2001 | Hygrothermal performance of building components and building elements - Internal surface temperature to avoid critical surface humidity and interstitial condensation - Calculation methods |
| ETAG | 004 | 2011 | Guideline for European technical approval of "External thermal insulation composite systems with rendering" |
| ETAG | 009 | 2002-06 | Guideline for European technical approval of "Non load bearing permanent shuttering kits/systems based on hollow blocks or panels of insulating materials and sometimes concrete" |
| ISORAST | | | Annex 15 |
| List of standards and guidelines | | | |