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		Title, Subtitle / Заглавие, подзаглавие ESP - Insulation Description for ESP	Project Doc. Number / № на проектния документ MTZ/12/B/HDE-----/EI/002			
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			1	2009-11-09	En	1/45

ALSTOM

Insulation Description for ESP - Maritza East I Power Station -

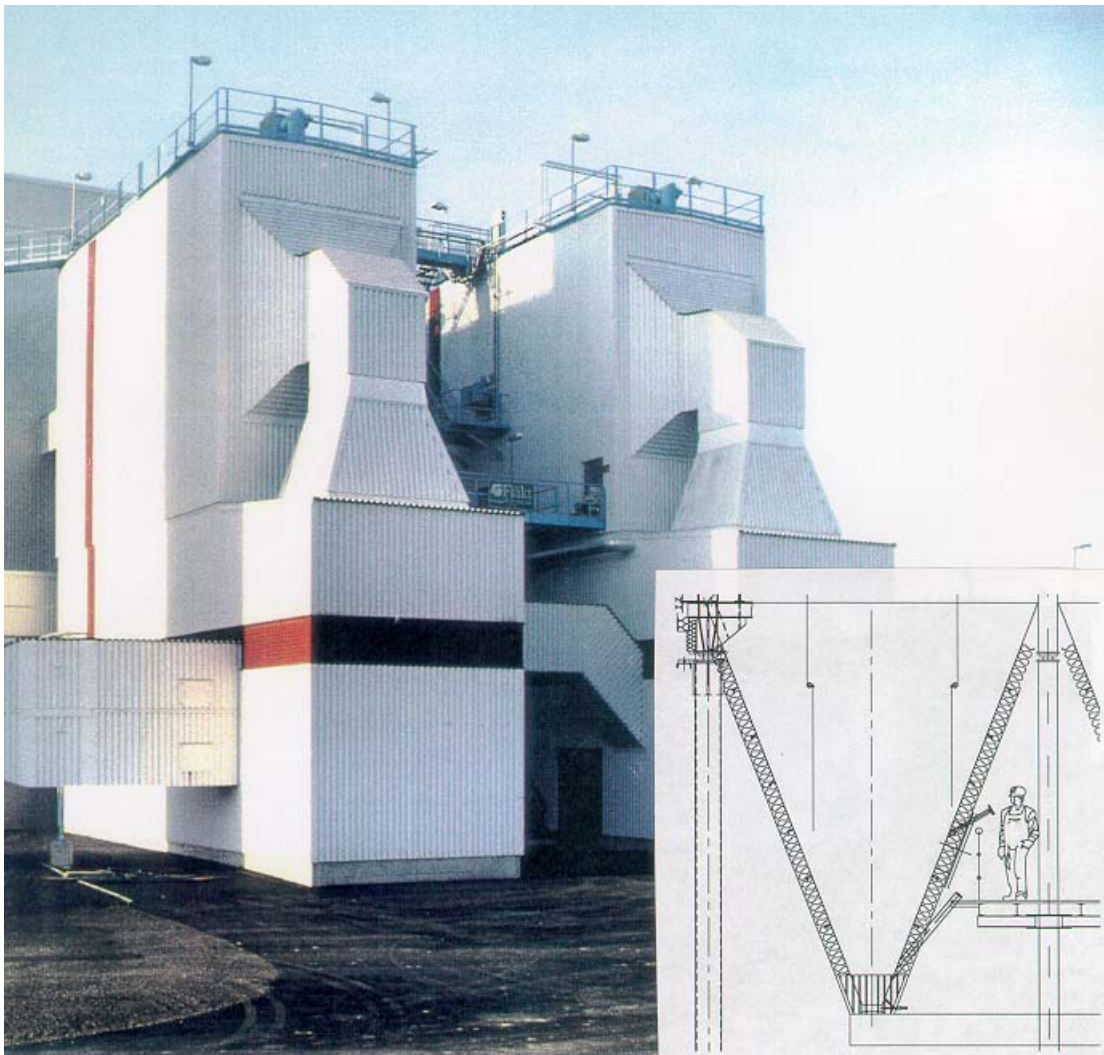


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- 6. Detailed design drawings**

5. Work specific specifications Maritza East 1 ESP's

Detailed specifications of insulation material, thickness, cladding etc. shall be according to MTZ/12/B/HDE-----EI003

6. Detailed design drawings**ESP UNIT 1 & 2
INSULATION DRAWINGS STATUS LIST –**

Item No	Project Doc No.	Revision No.	Description	Actual Status
1.	MTZ/12/B/HDE---/EA/044	0	ESP OVERALL SHEET 1/3	SFA
2.	MTZ/12/B/HDE---/EA/045	0	ESP OVERALL SHEET 2/3	SFA
3.	MTZ/12/B/HDE---/EA/046	0	ESP OVERALL SHEET 3/3	SFA
4.	MTZ/12/B/HDE---/EA/047	0	ESP INSULATION WALLS	SFA
5.	MTZ/12/B/HDE---/EA/048	0	ESP INSULATION INLETS	SFA
6.	MTZ/12/B/HDE---/EA/049	0	ESP INSULATION OUTLETS	SFA
7.	MTZ/12/B/HDE---/EA/050	0	ESP INSULATION HOPPERS	SFA
8.	MTZ/12/B/HDE---/EA/051	0	ESP INSULATION HOT ROOF	SFA
9.	MTZ/12/B/HDE---/EA/052	0	ESP INSULATION HOT ROOF TUNNELS	SFA
10.	MTZ/12/B/HDE---/EA/053	0	ESP INSULATION ROOF GABLE BEAM	SFA
11.	MTZ/12/B/HDE---/EA/054	0	ESP INSULATION INLET GABLE PANEL	SFA
12.	MTZ/12/B/HDE---/EA/055	0	ESP INSULATION OUTLET GABLE PANEL	SFA
13.	MTZ/12/B/HDE---/EA/056	0	ESP WATER GUTTER SYSTEM OF ROOF SHEET 1/2	SFA
14.	MTZ/12/B/HDE---/EA/057	0	ESP WATER GUTTER SYSTEM OF ROOF SHEET 2/2	SFA

1. Introduction / Pre-Remarks

The thermal / sound insulation and weather-resisting coating of electrostatic precipitators must comply with similar demands world-wide; however, they are influenced by regional working procedures and are implemented in different ways, using locally available materials. This draft for the insulation specification of electrostatic precipitators states the minimum demands and is intended to incite the insulation specialist to submit tenders in concrete projects, representing an optimised solution for the specific case of application.

One distinguishes between the roof, wall (gable) and funnel area. Mounting of the insulation on the filters shall take place on the ground, as far as possible, in lifting segments as large as possible (component size 100 – 150 m², the use of scaffolds shall be minimized).

In the following description, the well-known procedure shall be compared to alternatives that may be regionally preferable, generally in form of an appendix to the chapter concerned.

This description is based on the following References:

- Ref. 2 : Supplier's data - ROCKWOOL
- Ref. 3 : Supplier's data - GULLFIBER
- Ref. 4 : Supplier's data - PAROC
- Ref. 5 : Supplier's data - REINHOLD & MAHLA (R&M)

GENERAL

1.1 INSULATION INTRODUCTION

1.1.1 This instruction covers the general design of insulation and installation of lagging for the ABB Electrostatic precipitators to certain extent also applicable for Fabric filters, Reactors, Gas ducts, Dust handling equipment and Fans.

1.1.2 The main demands for thermal insulation are the following to

- minimize the heat loss
- limit the temperature drop
- avoid inside condensation
- prevent thermal distortion
- limit surface temperature
- noise reduction to certain extent

1.1.3 The insulation must be designed, furnished and installed in compliance to respective national codes and job specification requirements, for national codes, see appendix 1 this section, and insulation thickness for different applications, see appendix 2 also this section.

1.1.4 The insulation shall be installed over the reinforcement members of the equipment, and shall be in intimate contact with the wall surfaces. When prefabricated insulation panels are installed, convection barriers shall be provided, see 1.1.6.

The insulation shall be contoured to fit tightly around all penetrating shapes. The insulation shall prevent convection paths from the hot side to the cold side of the insulation at all penetrations.

1.1.5 The insulation application shall provide a weather proof seal and vapour barrier with no part of the insulation being exposed to weather conditions.

1.1.6 Thermal barriers to eliminate convection shall be provided when the insulation is installed over a sub-support system. Both horizontal and vertical convection barriers shall be installed when it is necessary. Maximum vertical at 1.5 m intervals and horizontally at maximum 3.0 m.

1.1.7 The application of the insulation material shall be based on the maximum specified design temperature.
Adequate flexibility for the insulation and cladding must be applied in order to avoid distortion and failure of the attachments by excursion temperatures.

- 1.1.8 All insulated heat carrying intems exceeding 100 °C shall be insulated with fire proof insulation. The insulation material shall comply to the national codes.
- 1.1.9 The insulation outer surface temperature for different insulation thickness by various operating temperatures is shown on drawing V2588612 under appendix 2 this section.

1.2 **QUALITY CONTROL PROVISIONS FOR THE INSULATION CONTRACTOR**

- 1.2.1 The contents of this instruction does not in anyway free the contractor from responsibility for the installed insulation work and materials.
- 1.2.2 The contractor shall submit certified copies of manufacturers test report covering chemical and physical properties of material to the purchaser, on special request.
- 1.2.3 If it is required or specified, infrared photos or coloured video shall be taken after the ESP has been heated; this documentation is at the insulation contractors expense, by normal operation of an independent third party mutually acceptable to both parties.
- 1.2.4 If corrective action is required after what is mentioned under point 1.2.3 infrared photos will be retaken at the expense of the insulator contractor. If for control purpose it is necessary to remove insulation and lagging the insulation and lagging is reinstalled on the contractors expense.

1.3 **WORKMANSHIP**

- 1.3.1 The insulation shall be installed in a manner that required standards are fulfilled bu also give proof of good workmanship which is in written agreement between ABB and the insulation contractor.
- 1.3.2 If an alternative method of insulation is proposed it is the responsibility of the insulation contractor to submit the proposal to ABB for approval before use.

1.4 **INSTALLATION REQUIREMENTS**

- 1.4.1 Insulation shall be applied to clean and dry surfaces. Laggings shall be applied to dry insulation only. Insulation shall be kept as dry as possible until final installation is completed.
- 1.4.2 Lagging shall be attached to the supports fasteners per manufacturer's recommendations. Lagging fastening system shall be designed for wind and loads as given in contract specification.
- 1.4.3 To prevent galvanic corrosion, materials of different metals may not be in direct contact with each other. Where it is necessary to attach the lagging to carbon steel or low alloy steel, it might be considered necessary to apply a protective primer. The use of lead base paint will not be acceptable.
- 1.4.4 By more than one layer of insulation, the insulation joints between layers have to be offset by at least 100 mm. The joining insulation in each layer is sewed together on all sides with galvanized steel wire if wire mesh mat is used. The wire is knotted once every meter per joint. Alternatively blankets are tied together with pliers. The blankets or hard sheets insulation is relieved by pins on the walls.
- 1.4.5 By outdoor installations the lagging shall be sloped to acquire appropriate drainage.

Appendix 1

As Guideline for Calculations, Guarantees, Measurement and Testing Methods, Quality Assurance, Supply Conditions, the VDI 2055 (issued in German / English) is recommended.

INSULATION NATIONAL CODES

SWEDEN	General instructions SSG 1591, SSF 1595, SSG 1596. Building code VVS AMA 83 section K, K4, K8 and L5. Thermal insulation SIS TB221. Building sheet SIS TB211.
GERMANY	DIN 4140 DIN 18 421 DIN EN 10 204 (normals DIN 50 049) VDI 2055 AGI REgelwerk
GREAT BRITAIN	BS 476 part 4, 7 and 8.
FINLAND	General instructions SFS 3777, SFS 3778, SFS 3779.
USA	ASTM C592-70 Mineral fiber blanket and blanket type pipe insulation (metal mesh covered). ASTM C547-77 Mineral fiber preformed pipe insulation. ASTM C612-77 Mineral fiber block and board thermal insulation. ASTM C533-72 Calcium silicate block and pipe thermal insulation.

APPENDIX 3

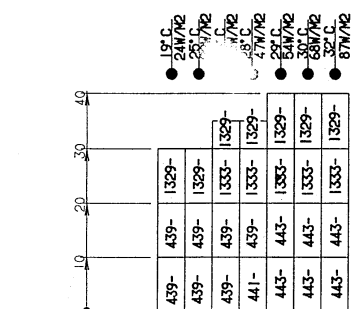


DIAGRAM 4

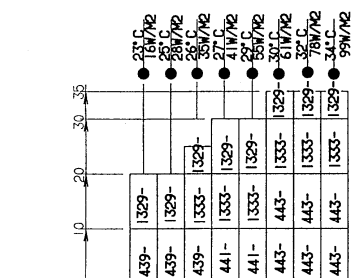


DIAGRAM 3

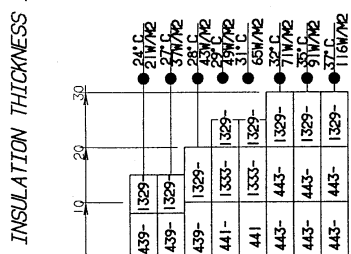
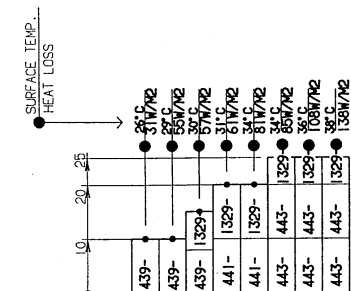
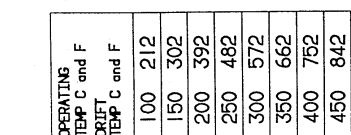


DIAGRAM 2



ДИАГРАМ /



ДИАГРАМ /

NOTE: THE SHOWN SURFACE TEMPERATURES AND HEAT LOSSES ARE FOR A HORIZONTAL ELEMENT IN 20°C SURROUNDING TEMPERATURE WITH THE AIR AT REST. SURROUNDING TEMPERATURE WITH AN ALUMINUM FLAT PLATE OVER SURFACE WITH A RADIATION COEFFICIENT OF $0.5 \text{ m}^2/\text{K}^4$

THE INTERNATIONAL
NAME FOR ROCKWOOL
IS ECOMAX

THE TRADE NAME GULLFIBER
IS INTERNATIONAL.

TYPICAL INSULATION MATERIALS

MANUFACTURER TILL VERNARE	PRODUCT NR.	INSULATION TYPE	THICKNESS MM T.O.OLEK MM	DENSITY MM VOL.WEIGHT KG/AG-LESS.FT3	MAX OPERATING TEMPERATURE MAX AWANIND TEMP	HEAT CONDUCTIVITY W/ME KONDUCTIVITY
ROCKWOOL	1329-00	SKIVA BLOCK	35-195	30 - 2	200C/392F	100C=0,061
ROCKWOOL	1333-00	SKIVA BLOCK	30-100	65 - 4	200C/392F	200C=0,067
ROCKWOOL	439-00	NATURAL BLANKET NETTING	30-100	65 - 4	250C/482F	200C=0,072
ROCKWOOL	441-00		30-100	100 - 6.25	300C/572F	300C=0,093
ROCKWOOL	443-00		30-100	100 -6.25	700C/1292F	400C=0,13
GULLFIBER	8361	BLOCK	30-100	70 -4.4	200C/392F	200C=0,077
GULLFIBER	6211	GLASSWOOL WITH NETTING	30-100	35 -2.2	500C/485F	300C=0,115
GULLFIBER	8231	NATURAL WITH NETTING	30-100	65 -4	250C/482F	200C=0,077
GULLFIBER	8251/8253		30-100	100 -6.25	700C/1292F	300C=0,089

[illegible]

No.	Name	Address - 1st name only	Division	Spoken	Read only	Join the working	Working on
27	Andrey	1st name only					

3.0 GENERAL INFORMATION FOR APPLICATION OF INSULATION MATERIAL

Additional to the following description of the traditional method you'll find Alternatives in Appendix 5 + 6 + 7

3.1.0 STORAGE

- 3.1.1 Mineral wool does not hold any water, therefore mineral wool blankets and blocks delivered rapped in plast are in no direct need of indoor storage.

Preformed pipe insulation should be stored in dry areas.

3.2.0 INSTALLATION OF INSULATION

- 3.2.1 The insulation is normally hanging on pins welded to the wall structure, pin quantity 6-8 /m². For welding pattern and the number of the pins, see appendix 1 + 5 (alt 1 + 2) to this section.

The pins have the following minimum dimensions:

- 4 mm round, $L_{max} \leq 200$ mm.
 - 5 mm round, $L_{max} = 500$ mm.
- Material: SS 1312-00, S235JR, ASTM A33.

The pins are either stud- or fillet welded. The stud welded pin is a straight piece of round bar. By fillet welded pins, the pin end is bend 30 mm for welding against the wall plate, see appendix 2 this section.

3.2.2 If applicable

For insulation of pressure vessels no welding is allowed after pressure control tests. It stands to reason that either pins or clips are welded prior to the test on which the insulation can be fastened in the field.

Special painting requirements might also require no welding after painting.

- 3.2.3 The installed insulation is kept in place on the pins by means of rectangular- or round solid washer. See appendix 2, sketches A,B,C.

3.2.4 Overlap

The overlap between two or more layers is minimum 100 mm.

3.2.5 Insulation joints

Mineral blankets joints are sewed together with galvanized 0.7 mm wire in all joints. Preformed pipe insulation is either taped or kept together by galvanized 0.7 mm wire.

3.2.6 For detailed information about application of insulation, see respective instruction per product.

3.2.7 Frame work for outer cladding

The following material is used for the frame structure holding the outer cladding in place, unless specified otherwise.

- girders L30*30*3 for wall sides
- girders L40*40*4 on roof and wall corners
- intermediate girders FB30*3

Girder material SS 1312-00, S235JR, ASTM A33.

Distance between girders depends on type of logging plate used but typical ranges are from 1200 to 1500 mm.

The girder design to support the cladding will be the responsibility of the insulation contractor.

In general the insulating contractor has to follow the local or specified demands for wind loads and/or other loads included in the stress code for the casing. That is to be decided for each individual precipitator.

It should be noted the choice of profiles and distances named are a recommendation only.
e.g., on corners where heavy wind loads can occur larger profiles can be necessary.

3.2.9 Corrosion

When flat bars are used for fastening of the girders these should always be welded on to wall stiffeners or beams.

3.3.1 Outer cladding

By indoor applications the plates are pop riveted with rivets 3.2 mm dia in Monel material. For horizontally riveted joints when the plate profile for trapezoid or corrugated plate is equal or larger than 45 mm, the plate is riveted in every valley. By plates less than 45 mm in height the riveting is done in every other valley, see appendix 3. For vertical joints the plates are pop riveted at 250 mm pitch.

By outdoor applications the plates are pop riveted in the vertical joints with Monel rivets 3.2 mm dia at 250 mm intervals. Horizontally the plates are screwed on to the girders with STAPS 308, 3.3 dia *19 mm. By trapezoid or corrugated plates with a profile height of 45 mm or larger, the plates are fastened with screws in every valley. By plates with a profile height less than 45 mm in every other valley.

Plane plates the screw pitch is 150 to 250 mm.

3.3.2 Galvanic elements

By risk for galvanic elements corrosion between plate and girder glass fiber shims $t_h = 2$ mm or similar are recommended.

3.3.3 Expansion joints

No through going girders are permitted which can endanger the thermal expansion. The girder brackets two in opposit corners are diagonally braced, see appendix 4. Opposite the braced corners, the plates corners are folded together enabling movement by thermal expansion, see also appendix 4.

FB30*3 brackets L min 200 mm are used as expansion items by twisting the ends 90° to facilitate expansion, see appendix 4.

3.3.4 Draining

All outdoor top side lagging must be sloped that proper drainage can be achieved not leaving rain water pools.

3.4 The alternative Methodes

Additional to the following description of the traditional method you'll find in

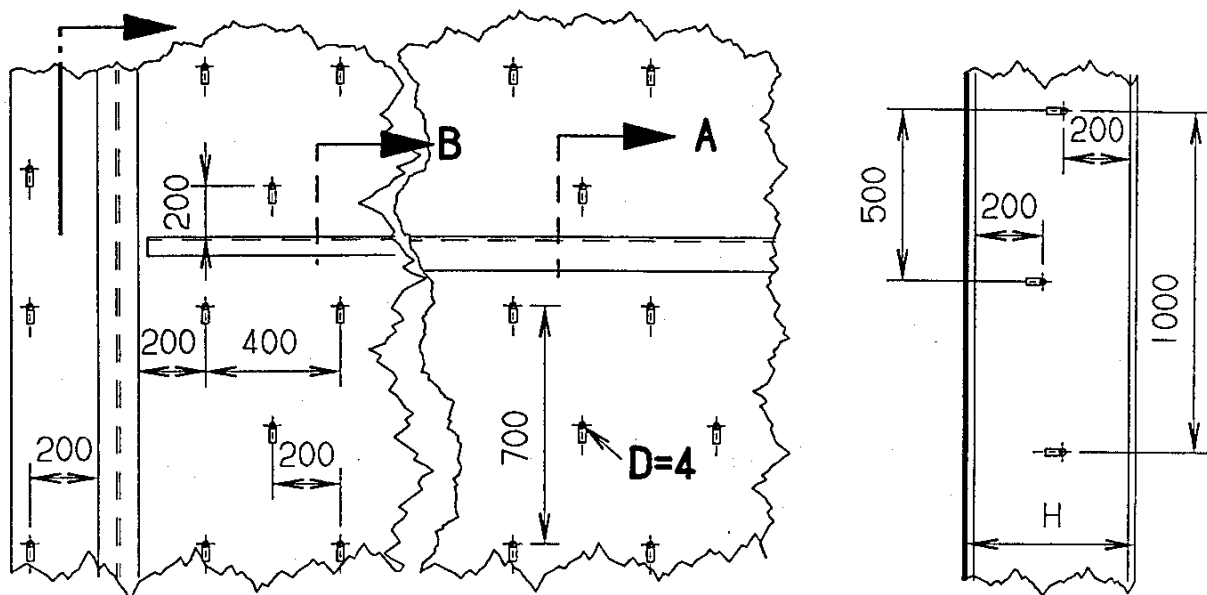
- Appendix 6 (Alt. 3) - application of rod mesh

Alternativ to 3.2.1, the mineral wool in applicated on a rod mesh with bent out wires (150 x 150 x 4); see drawing TF-SK 5001.

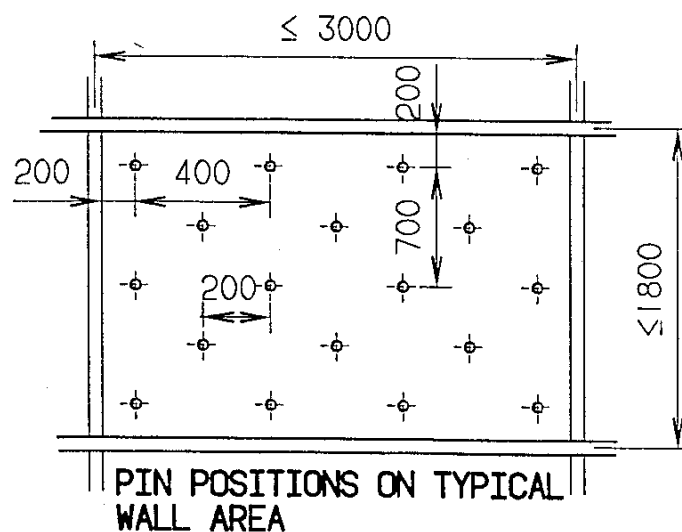
The mesh is tack welded to the wall stiffeners / columns, each 3rd wire (~ 9 pcs/m²) is cutted and bent out. Fixation of the wool as described in 3.2.1.

- Appendix 6 - fixation of preinsulated panels (open-type)
- Appendix 5 (Alt.4) - fixation of self-supporting panels
- Appendix 7 - application of AL-soft lagging element in the hopper area

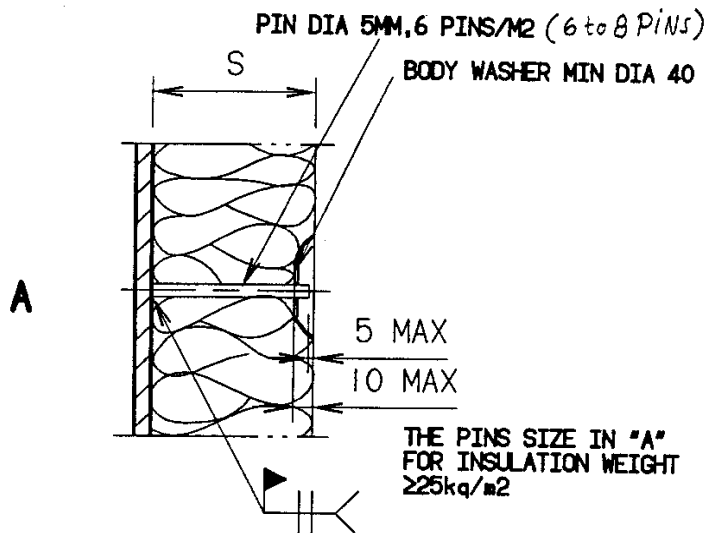
Appendix 1



H > 500
BY H ≤ 500, PINS
ARE LOCATED AS
SHOWN IN "A".



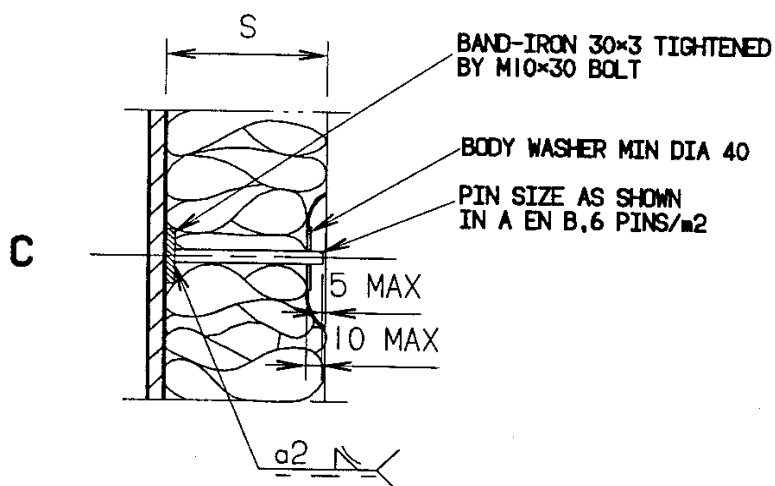
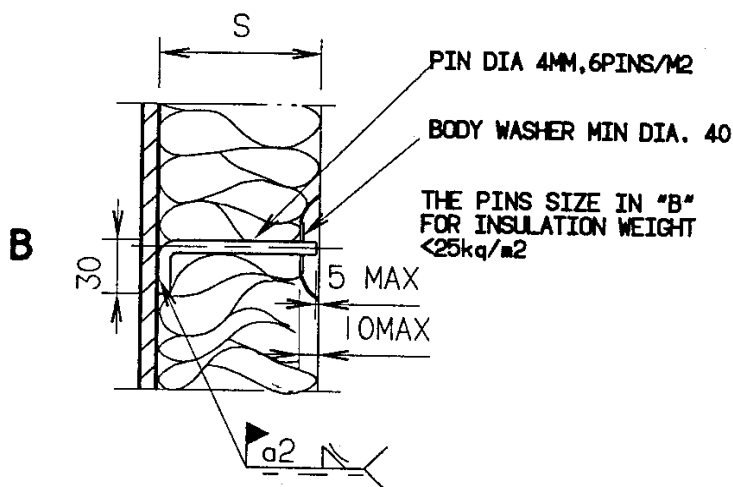
APPENDIX 2



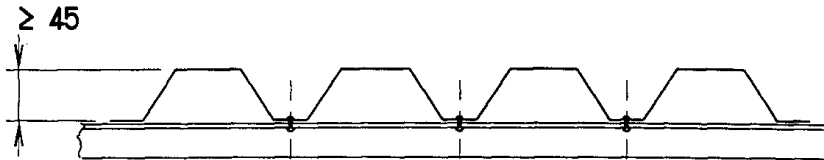
GENERAL NOTE

THE PINS SHALL HAVE THE SAME
MATERIAL AS THE PLATE THEY ARE
WELDED TO

THE INSULATED SURFACE SHALL BE
DRY, FREE FROM LOOSE SCALES,
DIRT, OIL AND OTHER FOREIGN MATTE
SPOT GROUND AS REQUIRED FOR
WELDING OF THE PINS.

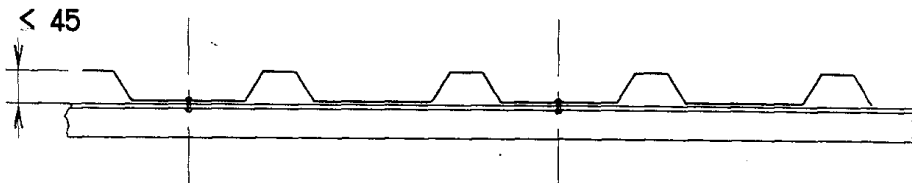


Appendix 3



BY INDOOR APPLICATIONS WITH PLATE PROFILE
 ≥ 45 THE PLATE IS RIVETED IN EVERY VALLEY.

BY OUTDOOR APPLICATIONS AS ABOVE BUT THE
PLATE IS SCREWED INSTEAD.

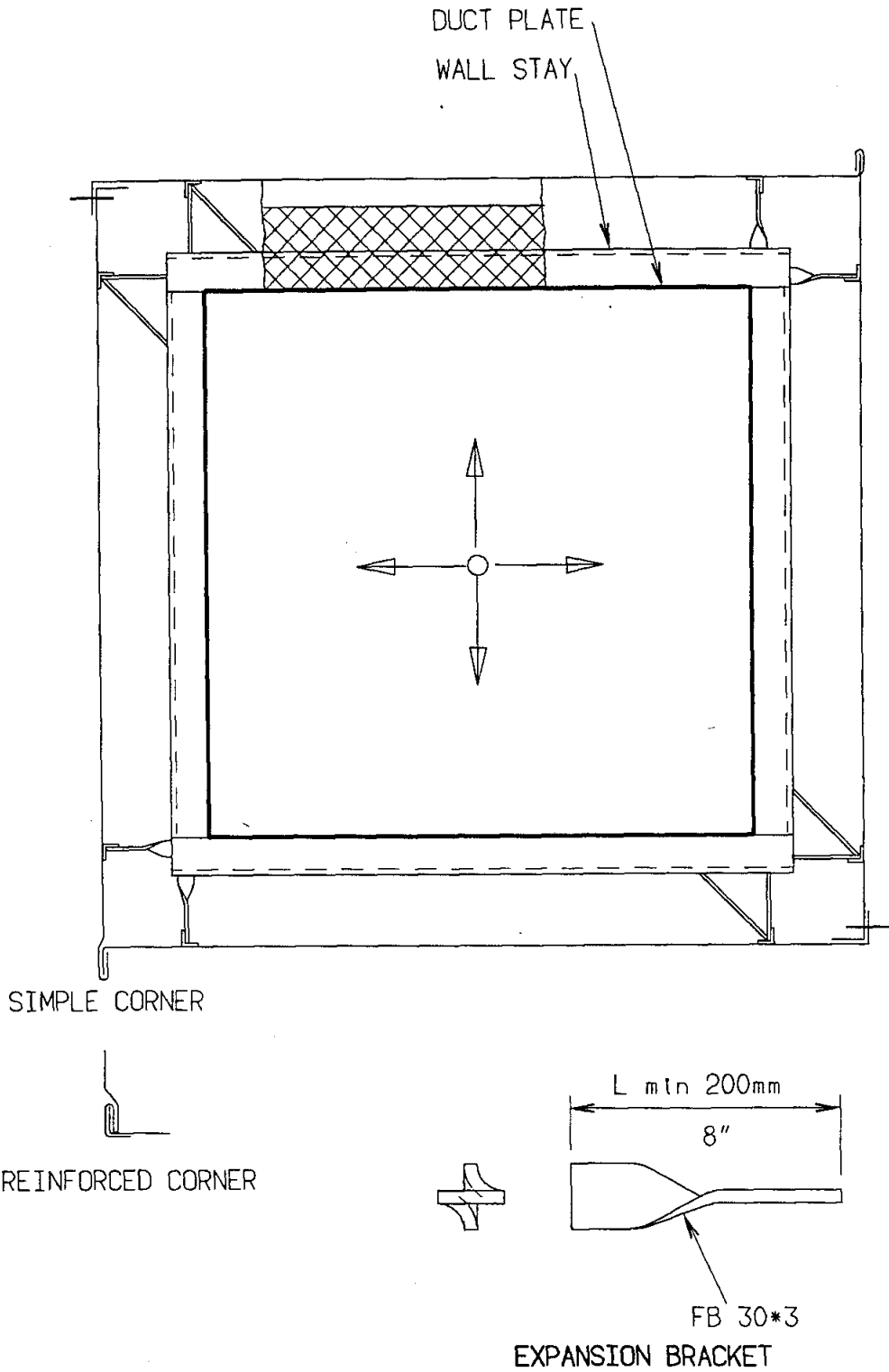


BY INDOOR APPLICATIONS WITH PLATE PROFILE
 < 45 THE PLATE IS RIVETED IN EVERY OTHER VALLEY.

BY OUTDOOR APPLICATIONS AS ABOVE BUT THE
PLATE IS SCREWED INSTEAD

Appendix 4

OUTER CLADDING EXPANSION PRINCIPLE

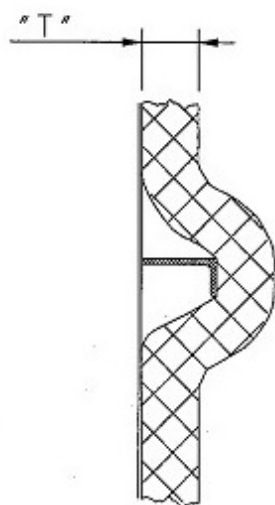


Appendix 5

SIDE WALL INSULATION
PRINCIPLES.

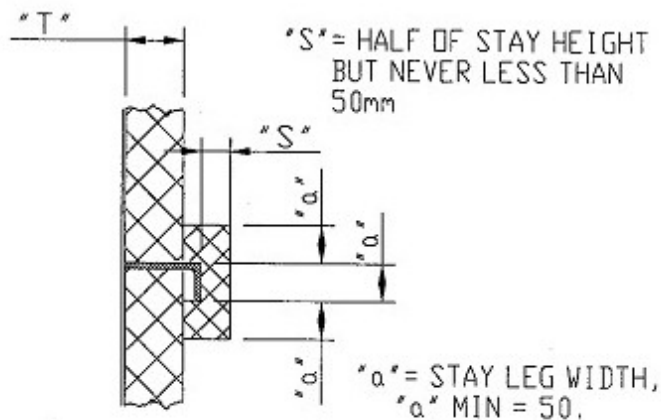
ALT. 1

CONTINUOUS BLANKET
INSULATION OVER STAYS
WITH HEIGHT $\sqrt{U+2264200}$ mm



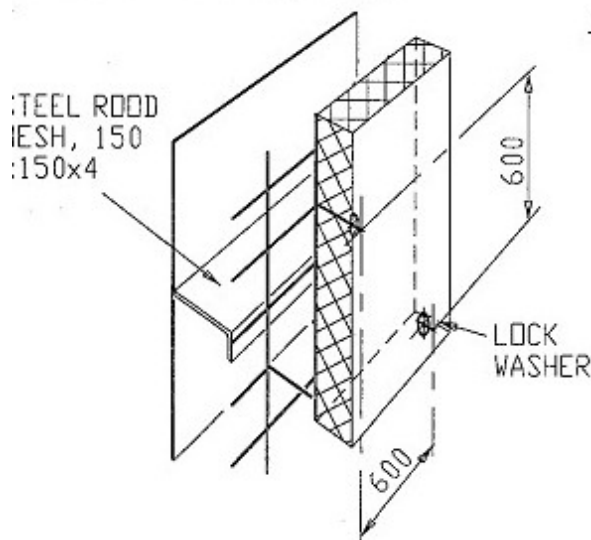
ALT. 2

BLOCK INSULATION COVERING
STAYS BY DIFFERENT INSULATION
THICKNESSES. NO GAPS BETWEEN
BLOCKS ARE ACCEPTABLE, MIN OVERLAP
BETWEEN BLOCKS ARE 100 mm.



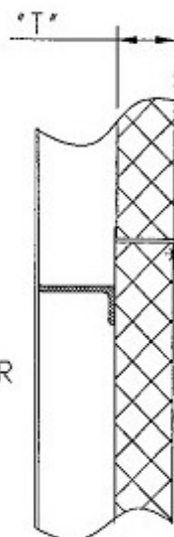
ALT. 3

BLOCK INSULATION OVER-
STEEL ROD MESH. MESH
TACK WELDED TO EXISTING
WALL STIFFERNES. STEEL
ROD CUTTED AND BENT OUT.



ALT. 4

PRE FABRICATED INSULATION
PANELS. FIXED TO EXISTING
WALL STIFFERNES.



DATE 99-06-15 REV.

NOTE:
INSULATION THICKNESS = 100 mm

TYPICAL ELECTROSTATIC PRECIPITATOR.

VIEW OF A SINGLE RING SEEN FROM OPPOSITE DIRECTION OF VIEW, IT CONSISTS TWO LAYERS OF EACH 50 MM THICK INSULATION.

PRE-INSULATED PANELS.

PANEL, SOLDERED TO CONNECTION IRONS.

VIEW: C

VIEW: D

VIEW: E

VIEW: F

VIEW: G

VIEW: H

VIEW: I

VIEW: J

VIEW: K

VIEW: L

VIEW: M

VIEW: N

VIEW: O

VIEW: P

VIEW: Q

VIEW: R

VIEW: S

VIEW: T

VIEW: U

VIEW: V

VIEW: W

VIEW: X

VIEW: Y

VIEW: Z

VIEW: A

VIEW: B

VIEW: C

VIEW: D

VIEW: E

VIEW: F

VIEW: G

VIEW: H

VIEW: I

VIEW: J

VIEW: K

VIEW: L

VIEW: M

VIEW: N

VIEW: O

VIEW: P

VIEW: Q

VIEW: R

VIEW: S

VIEW: T

VIEW: U

VIEW: V

VIEW: W

VIEW: X

VIEW: Y

VIEW: Z

VIEW: A

VIEW: B

VIEW: C

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VIEW: E

VIEW: F

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VIEW: J

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VIEW: U

VIEW: V

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VIEW: Y

VIEW: Z

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VIEW: B

VIEW: C

VIEW: D

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VIEW: C

VIEW: D

VIEW: E

VIEW: F

VIEW: G

VIEW: H

VIEW: I

VIEW: J

VIEW: K

VIEW: L

VIEW: M

VIEW: N

VIEW: O

VIEW: P

VIEW: Q

VIEW: R

VIEW: S

VIEW: T

VIEW: U

VIEW: V

VIEW: W

VIEW: X

VIEW: Y

VIEW: Z

VIEW: A

VIEW: B

VIEW: C

VIEW: D

VIEW: E

VIEW: F

VIEW: G

VIEW: H

VIEW: I

VIEW: J

VIEW: K

VIEW: L

VIEW: M

VIEW: N

VIEW: O

VIEW: P

VIEW: Q

VIEW: R

VIEW: S

VIEW: T

VIEW: U

VIEW: V

VIEW: W

VIEW: X

VIEW: Y

VIEW: Z

VIEW: A

VIEW: B

VIEW: C

VIEW: D

VIEW: E

VIEW: F

VIEW: G

VIEW: H

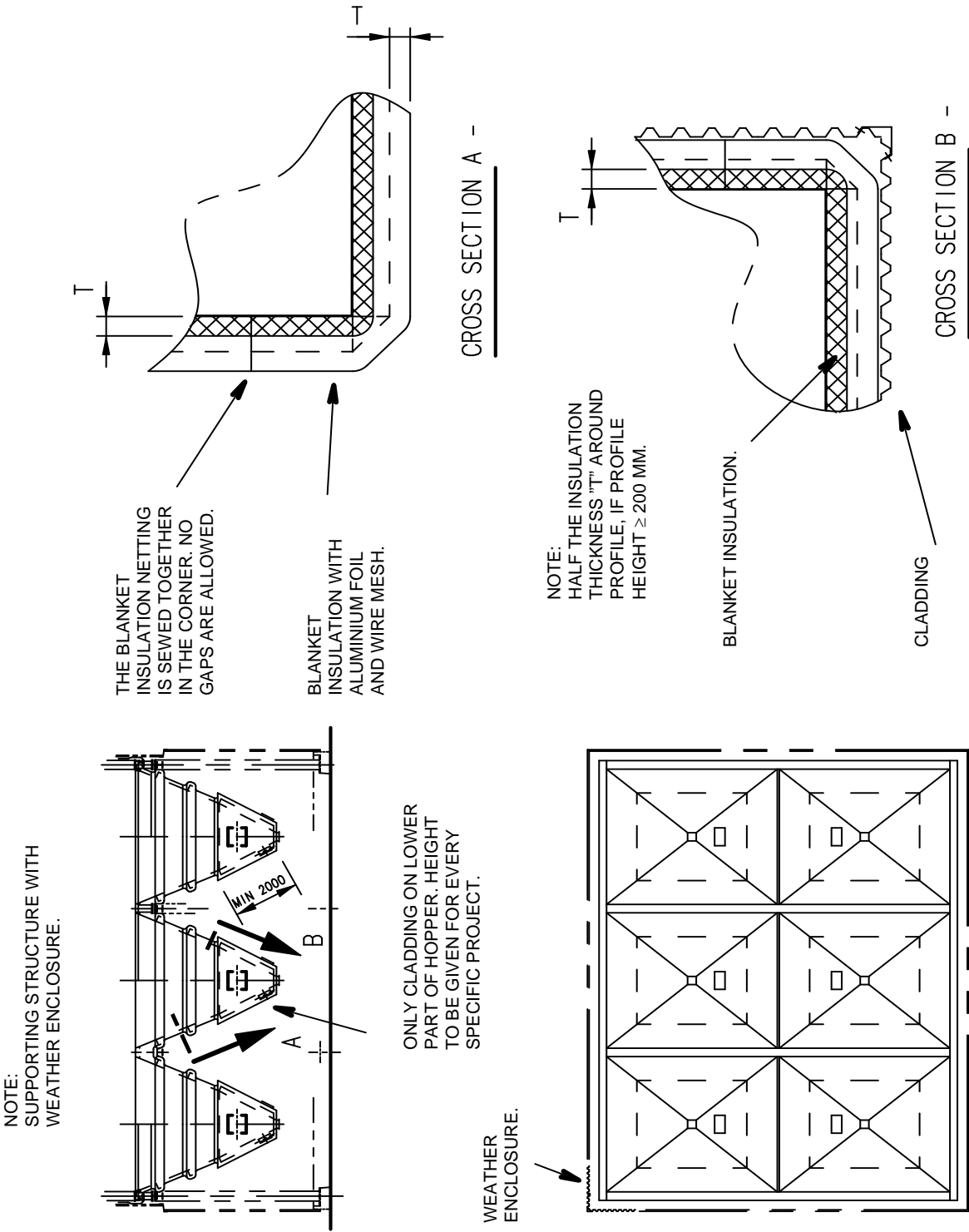
VIEW: I

VIEW: J

VIEW: K

<

Appendix 7

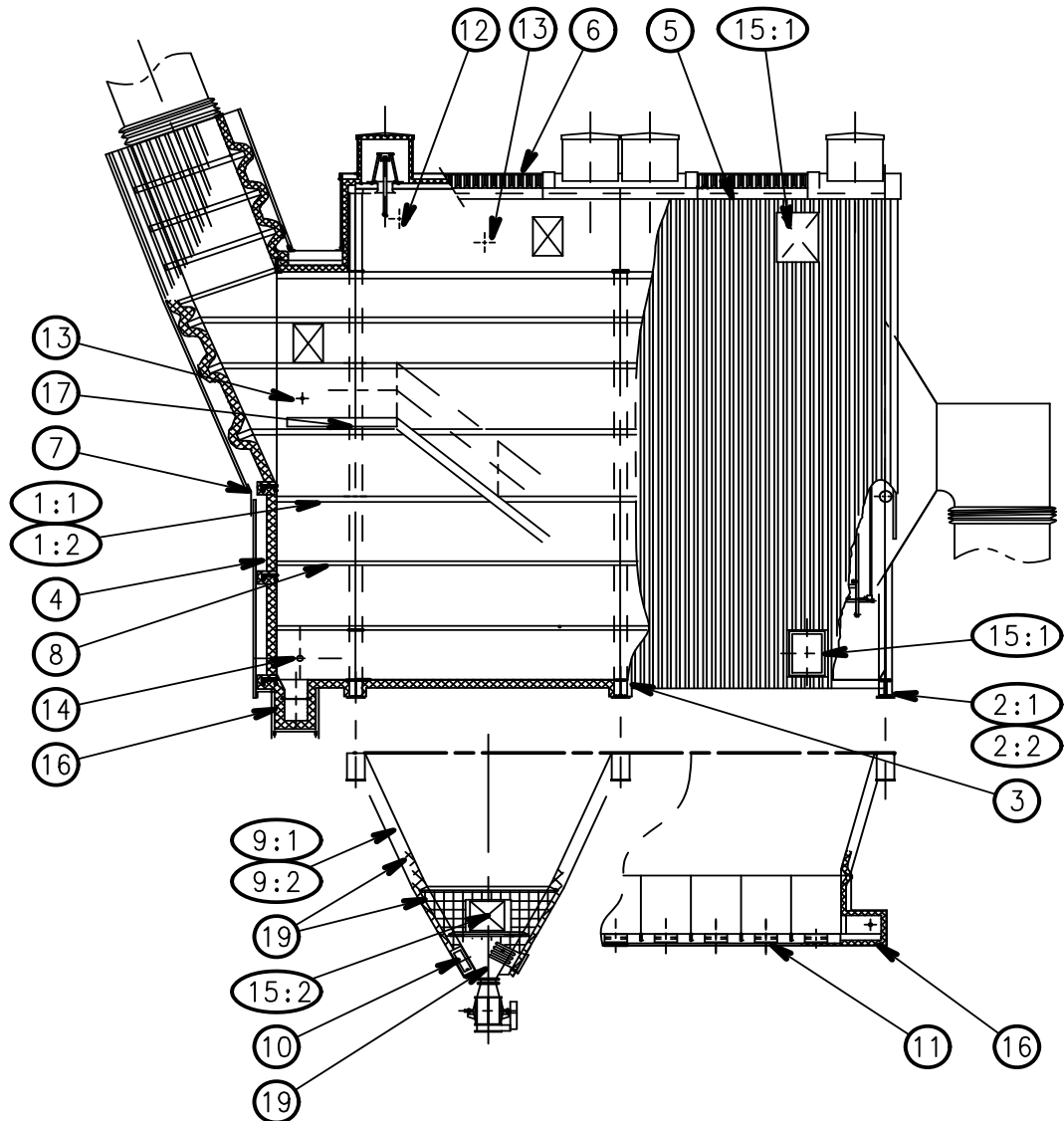


4 INSULATION INSTRUCTION

Typical insulation solutions for different parts of Electrostatic Precipitator FTA/FPA are shown on enclosed drawings.

List of enclosures see next page

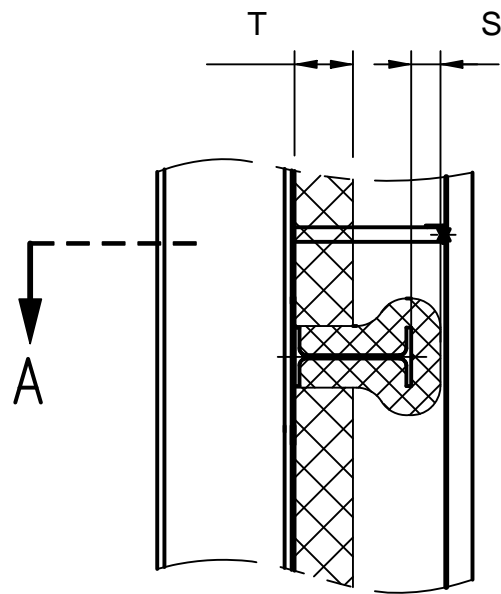
TYPICAL INSULATION OF ELECTROSTATIC PRECIPITATOR OF FTA / FPA DESIGN.



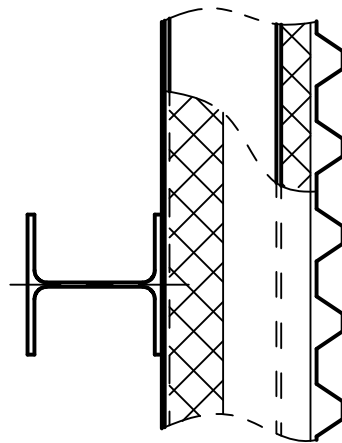
DRAWING LIST FOR INSULATION OF:

PART	ENCLOSURE	PART	ENCLOSURE
WALL BEAMS	1:1	HOPPER HEATING ARR'T NR 2	10
WALL BEAMS, PRE.INSULATED	1:2	HOPPER HEATING ARR'T NR 1	11
COLUMN BASE, SIDE WALL	2:1	DISCHARGE DRIVE SIDE WALL	12
COLUMN BASE	2:2	COLLECTING DRIVE SIDE WALL	13
BOTTOM BEAM	3	GAS DISTR.DRIVE SIDE WALL	13
WALL CORNERS	4	SCRAPER DRIVE ARR'T NR 3	14
WALL TO ROOF	5	INSPECTION DOOR, CASING	15:1
ROOF	6	INSPECTION DOOR, HOPPER	15:2
IN- AND OUTLET NOZZLES	7	DISCHARGE CONVEYOR	16
SIDE WALL PRINCIPLE	8	PLATFORM/STAIR BRACKET CONN.	17
HOPPER, WITHOUT WEATHER ENCL.	9:1	HOPPER INDICATORS	18
HOPPER, WITH WEATHER ENCL.	9:2	POKE HOLE	19

WALL BEAMS

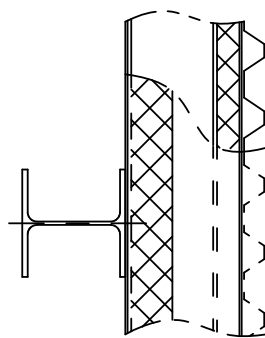
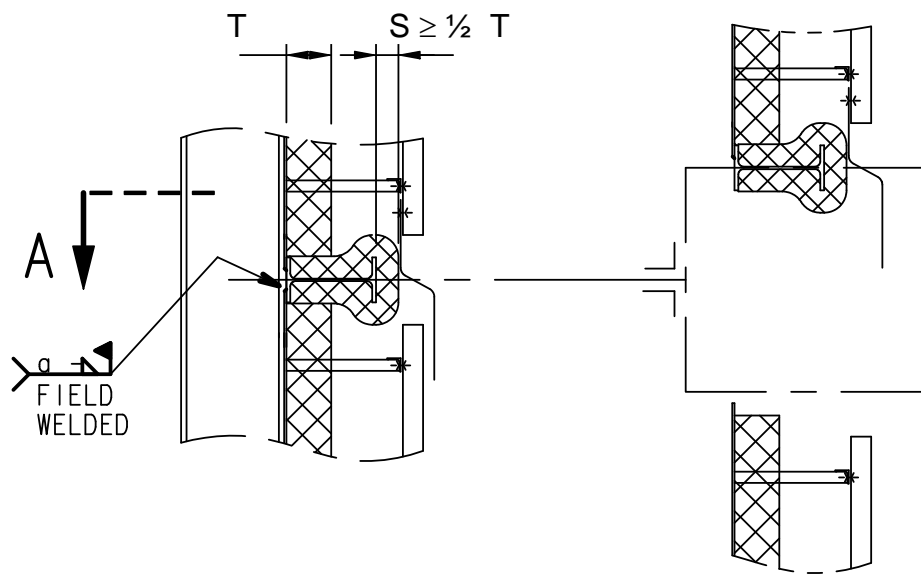


"S" \geq HALF OF INSULATION
THICKNESS "T". BUT NEVER
LESS THAN 50 MM.



CROSS SECTION A -

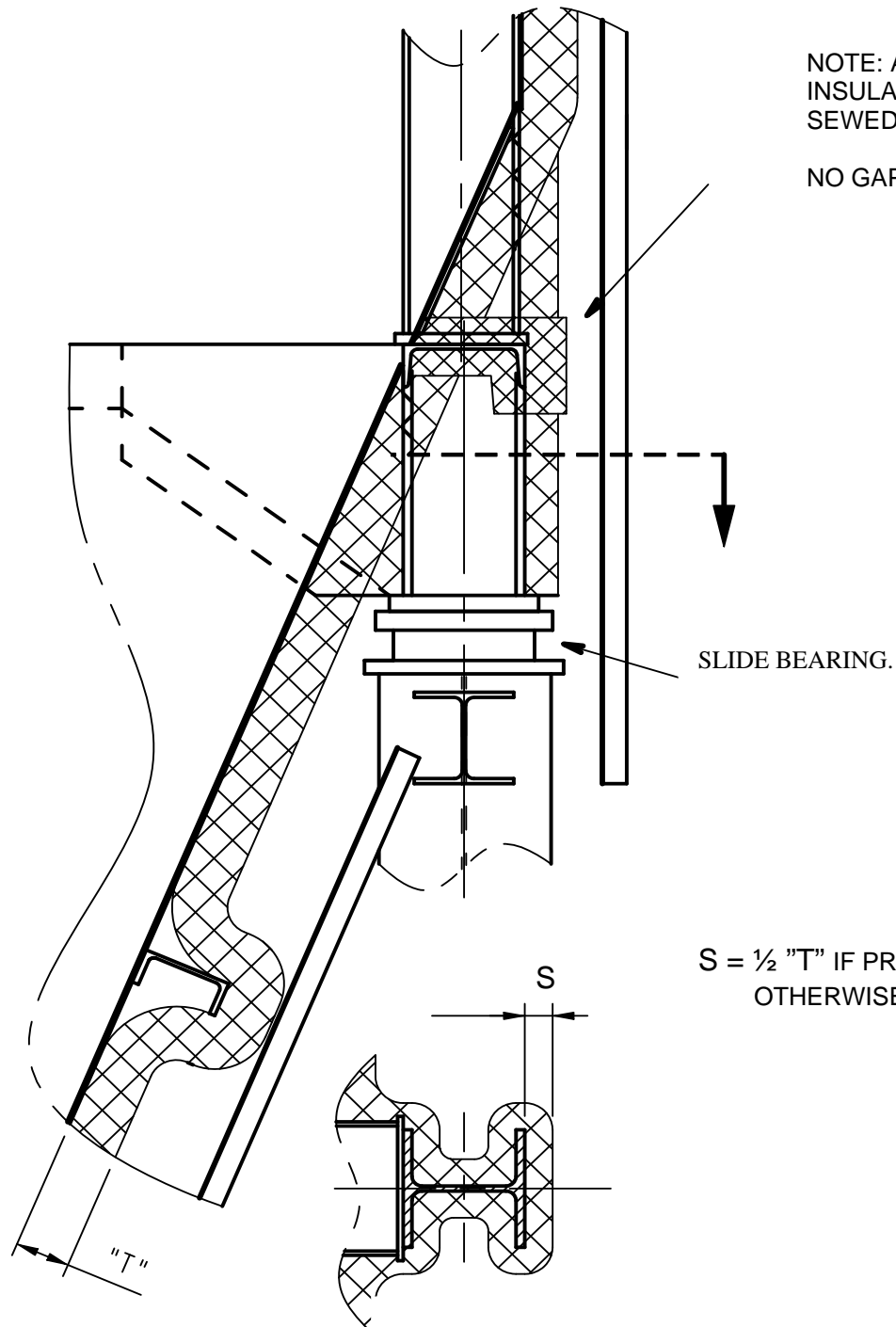
BROKEN WALL CLADDING FOR PRE-INSULATED PANELS.



PRINCIPLE OF PRE INSULATED
PANEL CONNECTION WITH
COVER PLATE.

CROSS SECTION A -

SIDE WALL COLUMN BASE.



NOTE: ALL SEAMS BETWEEN
INSULATION BLANKETS TO BE
SEWED WITH 0.7 MM WIRE.

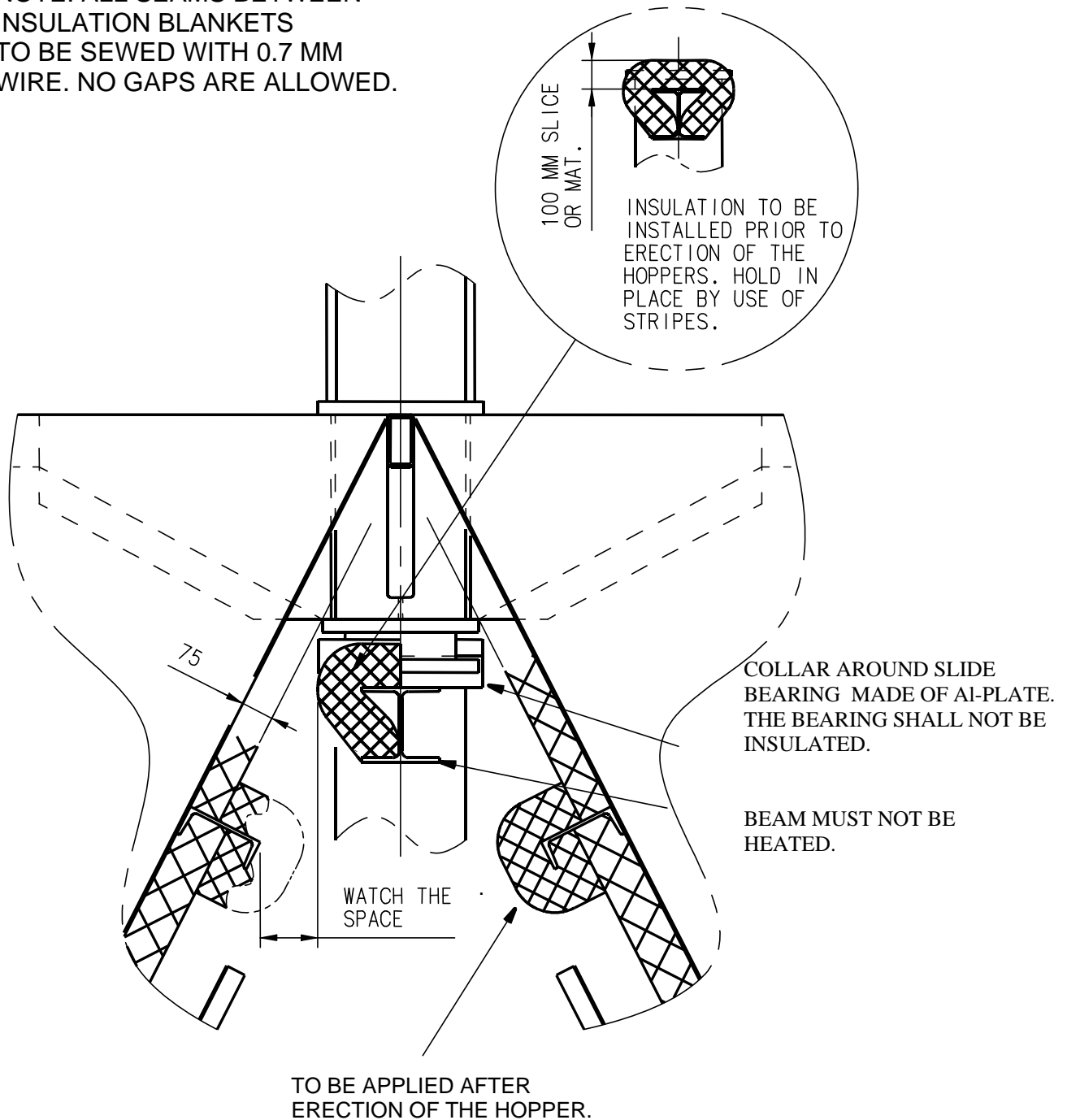
NO GAPS ARE ALLOWED.

SLIDE BEARING.

$S = \frac{1}{2} "T"$ IF PROFILE ≥ 200 MM.
OTHERWISE $S = T$.

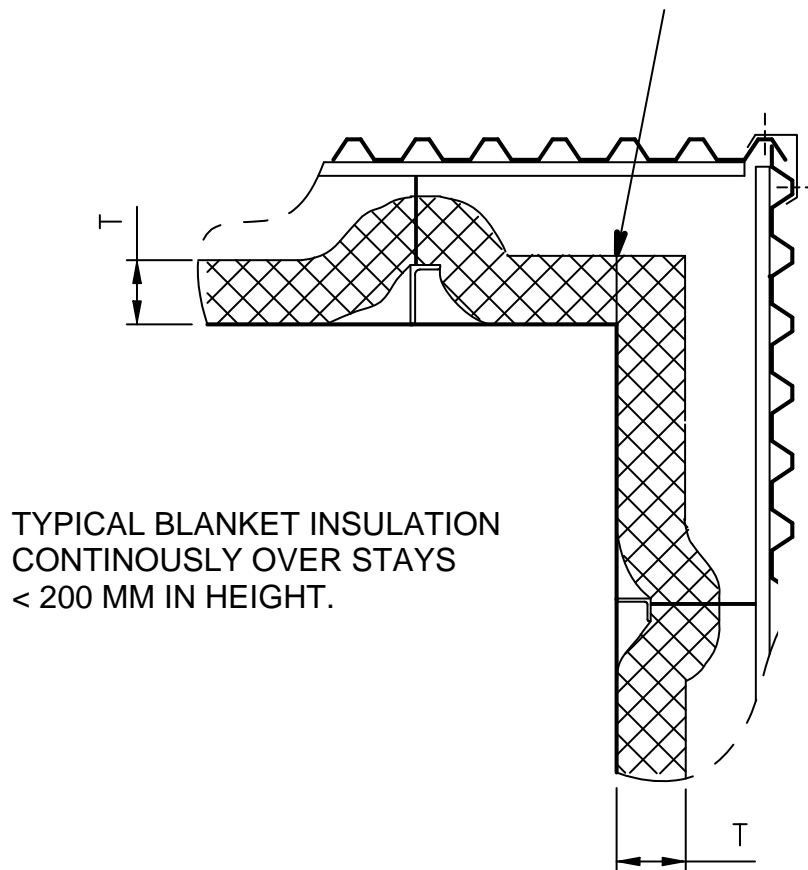
INTERNAL COLUMN BASE

NOTE: ALL SEAMS BETWEEN
INSULATION BLANKETS
TO BE SEWED WITH 0.7 MM
WIRE. NO GAPS ARE ALLOWED.



TYPICAL INSULATION OF WALL CORNERS.

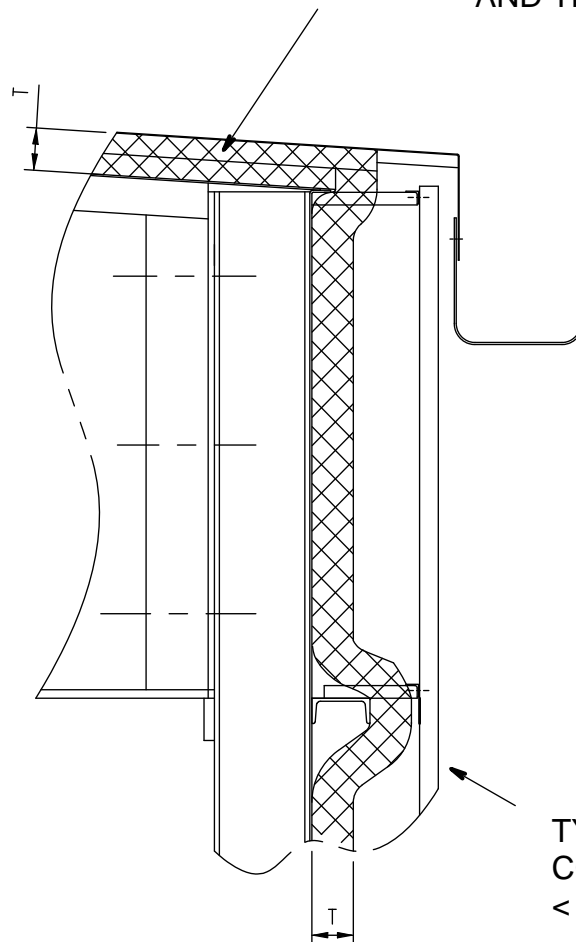
THE BLANKET INSULATION NETTING
IS SEWED TOGETHER IN THE CORNER.
NO GAPS ARE ALLOWED.



WALL TO ROOF INSULATION.

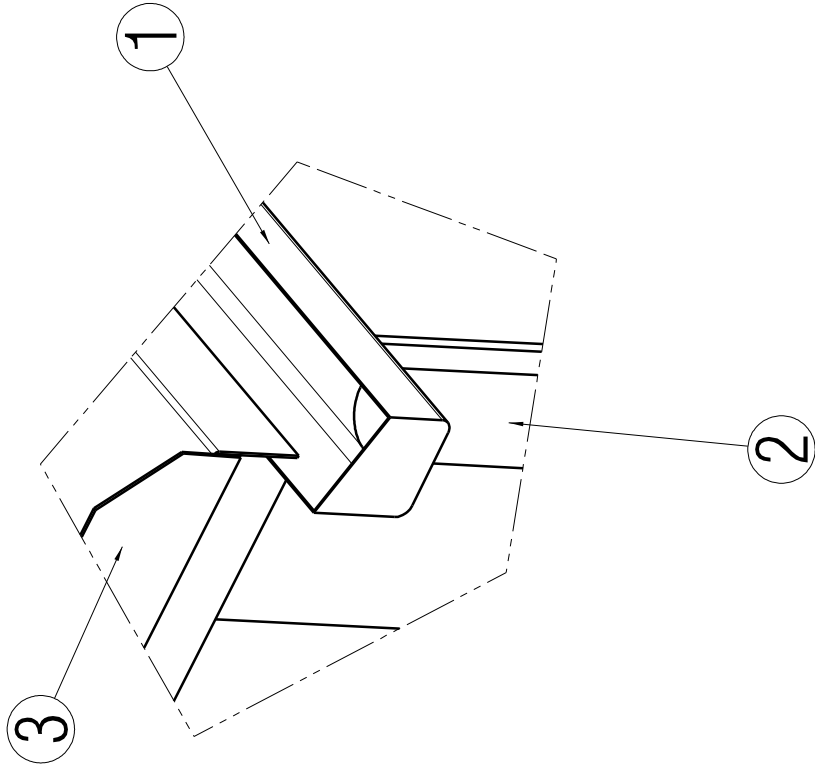
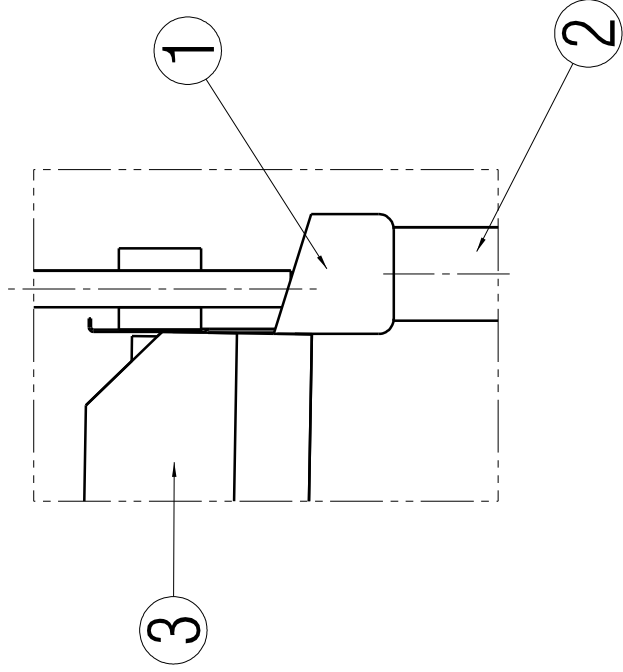
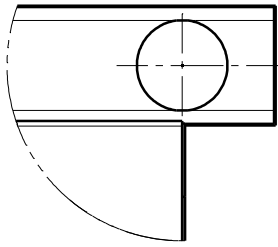
HARD INSULATION ON
CASING ROOF.

NOTE:
CHECK ALLOWED TEMP.
FOR THE ROOF INSULATION.
IF REQUIRED USE A 50 MM
BLANKET INSULATION
BETWEEN HARD INSULATION
AND THE HOT ROOF.



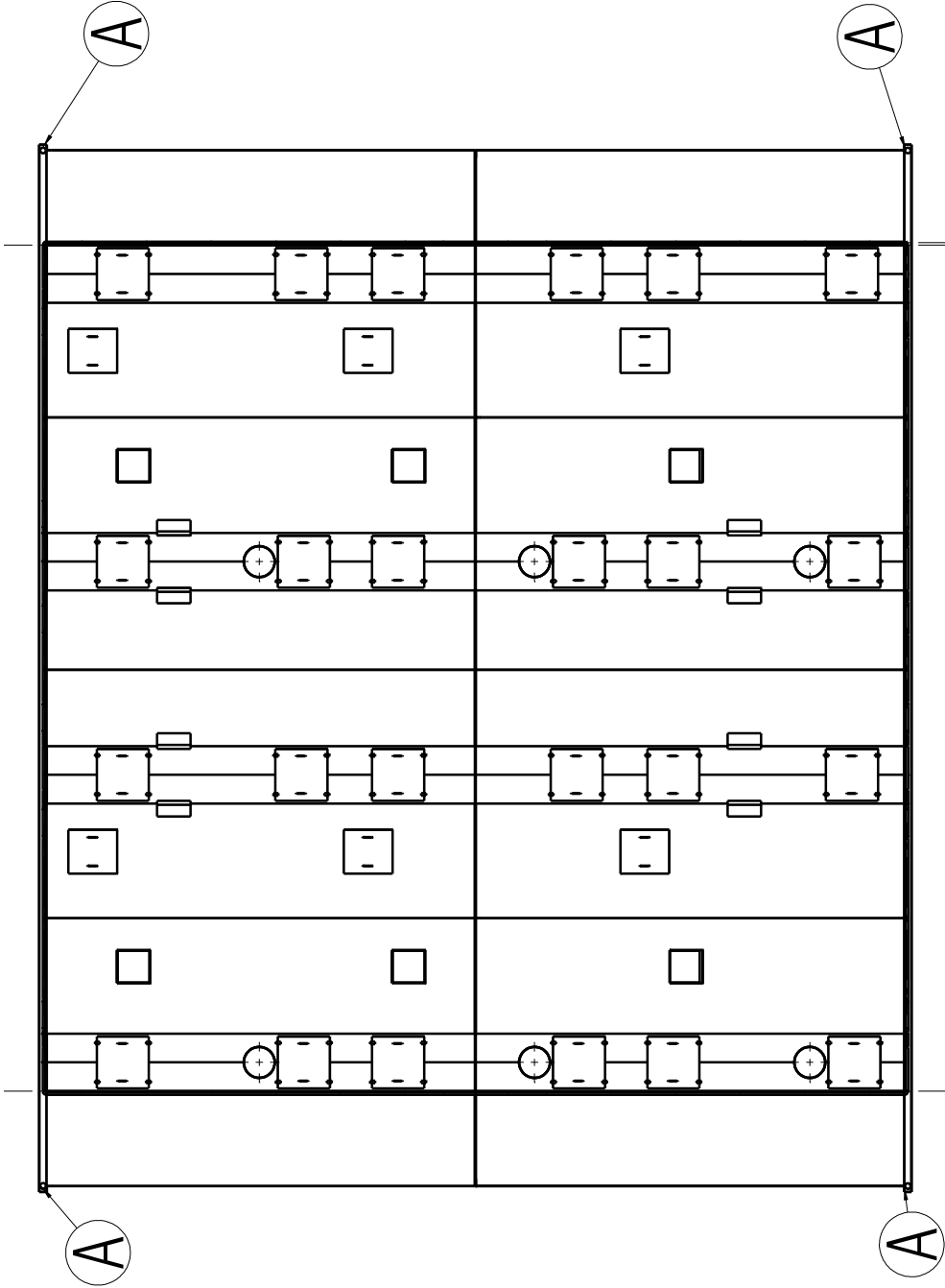
TYPICAL BLANKET INSULATION
CONTINUOUSLY AROUND STAYS
< 200 MM IN HEIGHT.

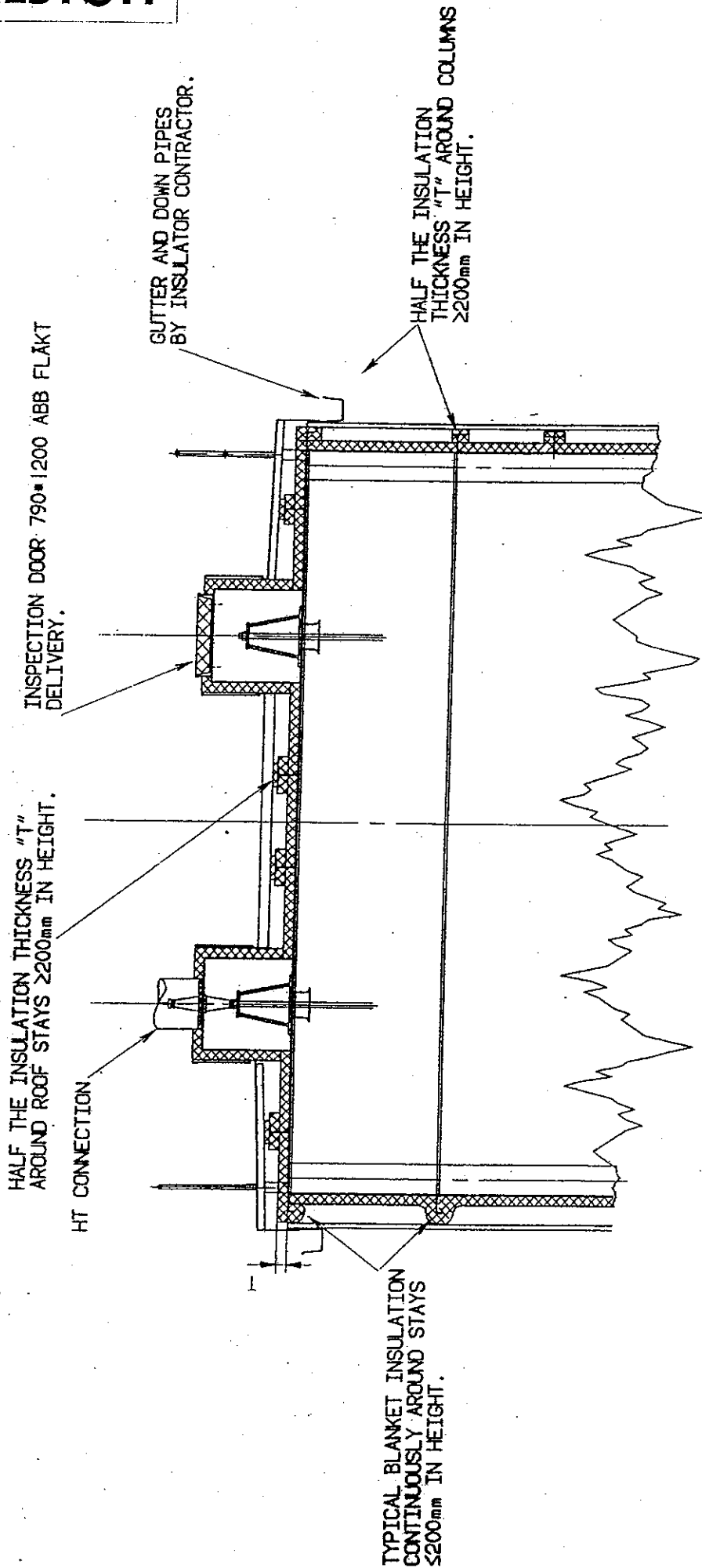
A



3	TRESHOLD PLATE
2	DRAIN PIPE
1	RAIN GUTTER

GAS DIRECTION



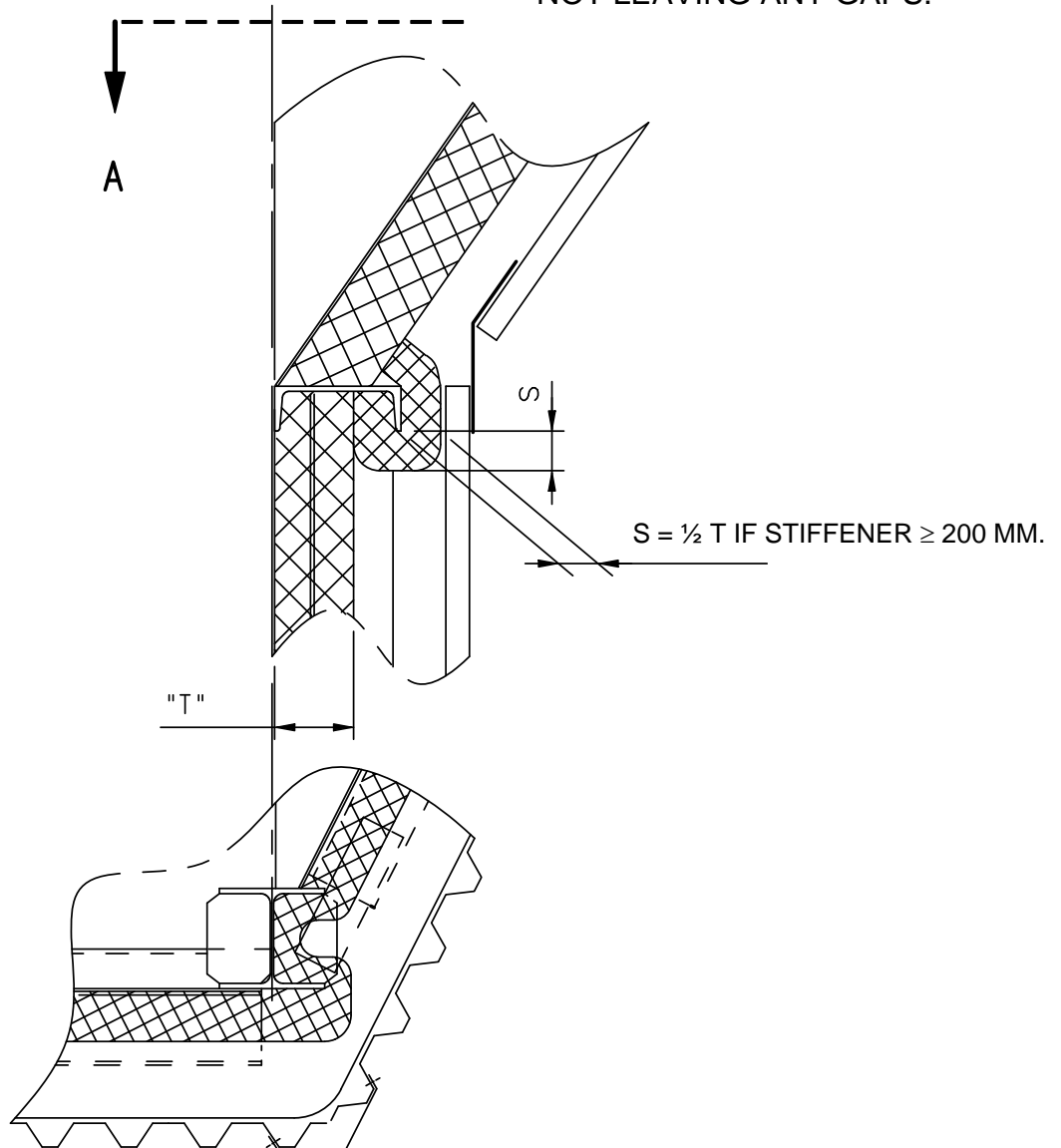


CROSS SECTION FTA CASING

ROOF

IN AND OUTLET NOZZLES WITH CONNECTIONS TO CORNER COLUMNS.

BLANKET INSULATION TO
COVER PROFILES IS NEALED
TO THE REGULAR INSULATION.
NOT LEAVING ANY GAPS.

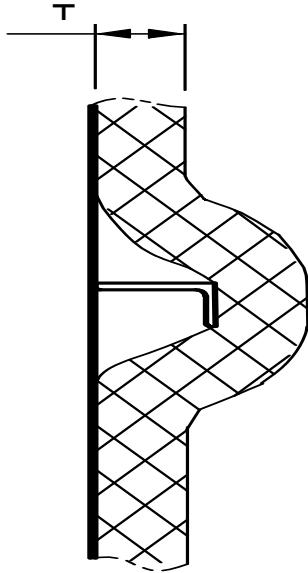


CROSS SECTION A -

SIDE WALL INSULATION PRINCIPLES.

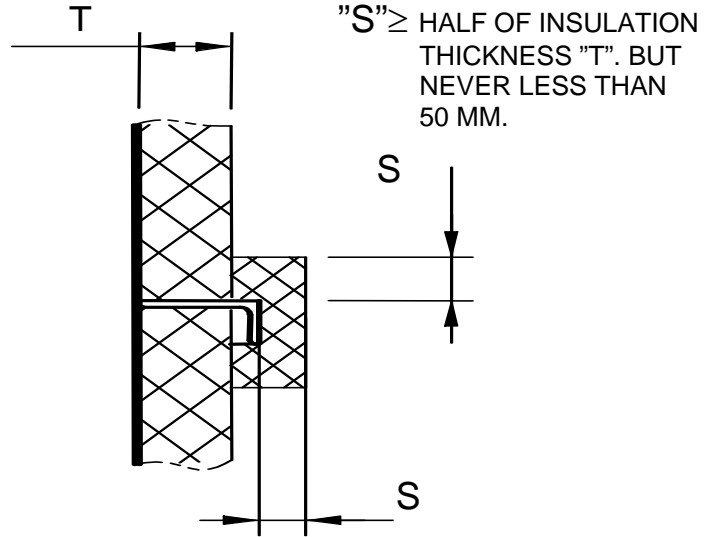
ALT. 1

CONTINUOUS BLANKET INSULATION OVER STIFFENERS WITH HEIGHT < 200 MM.



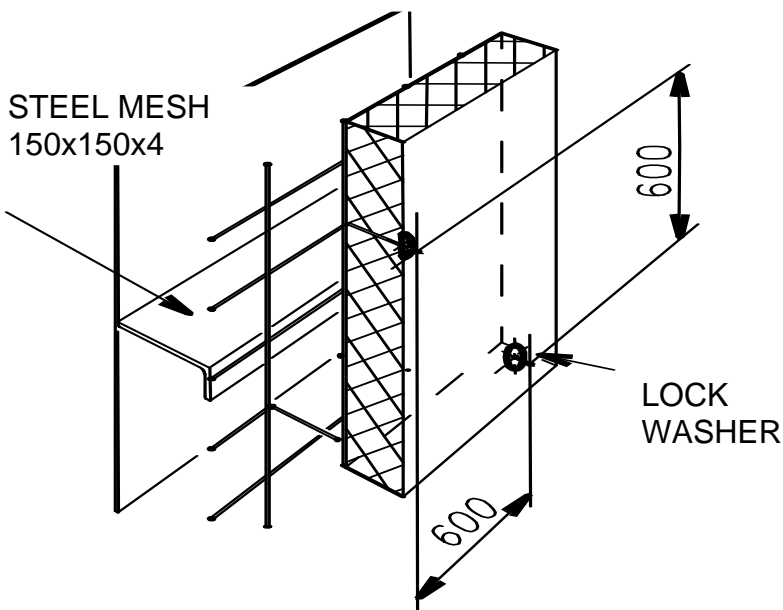
ALT. 2

BLOCK INSULATION COVERING STAYS BY DIFFERENT INSULATION THICKNESSES. NO GAPS BETWEEN BLOCKS ARE ACCEPTED. MIN. OVERLAP BETWEEN BLOCKS ARE 100 MM



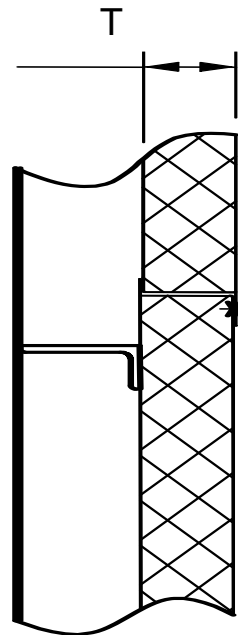
ALT. 3

BLOCK INSULATION OVER STEEL ROD MESH. MESH TACK WELDED TO EXISTING WALL STIFFERNES. STEEL ROD CUTTED AND BENT OUT.

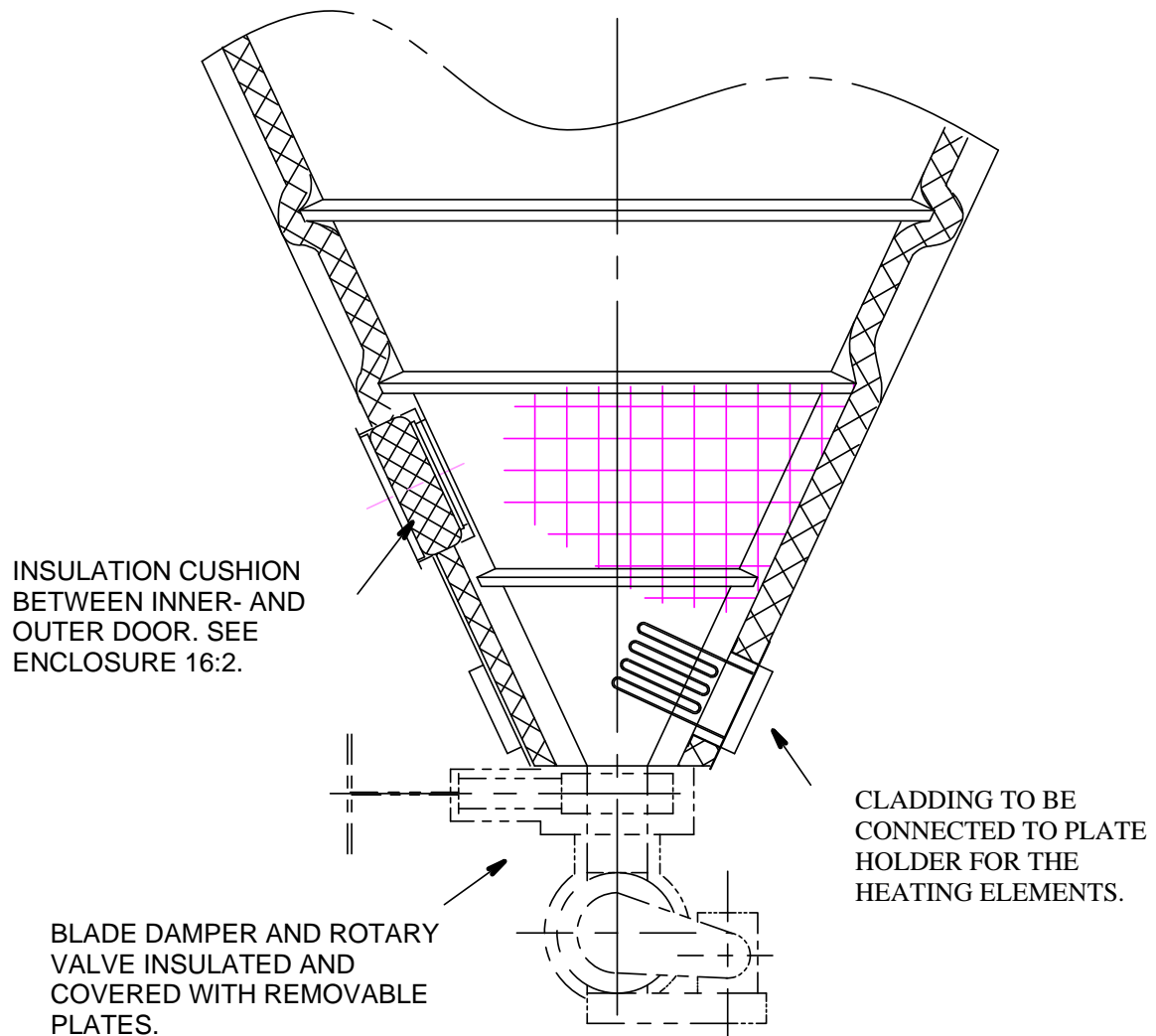


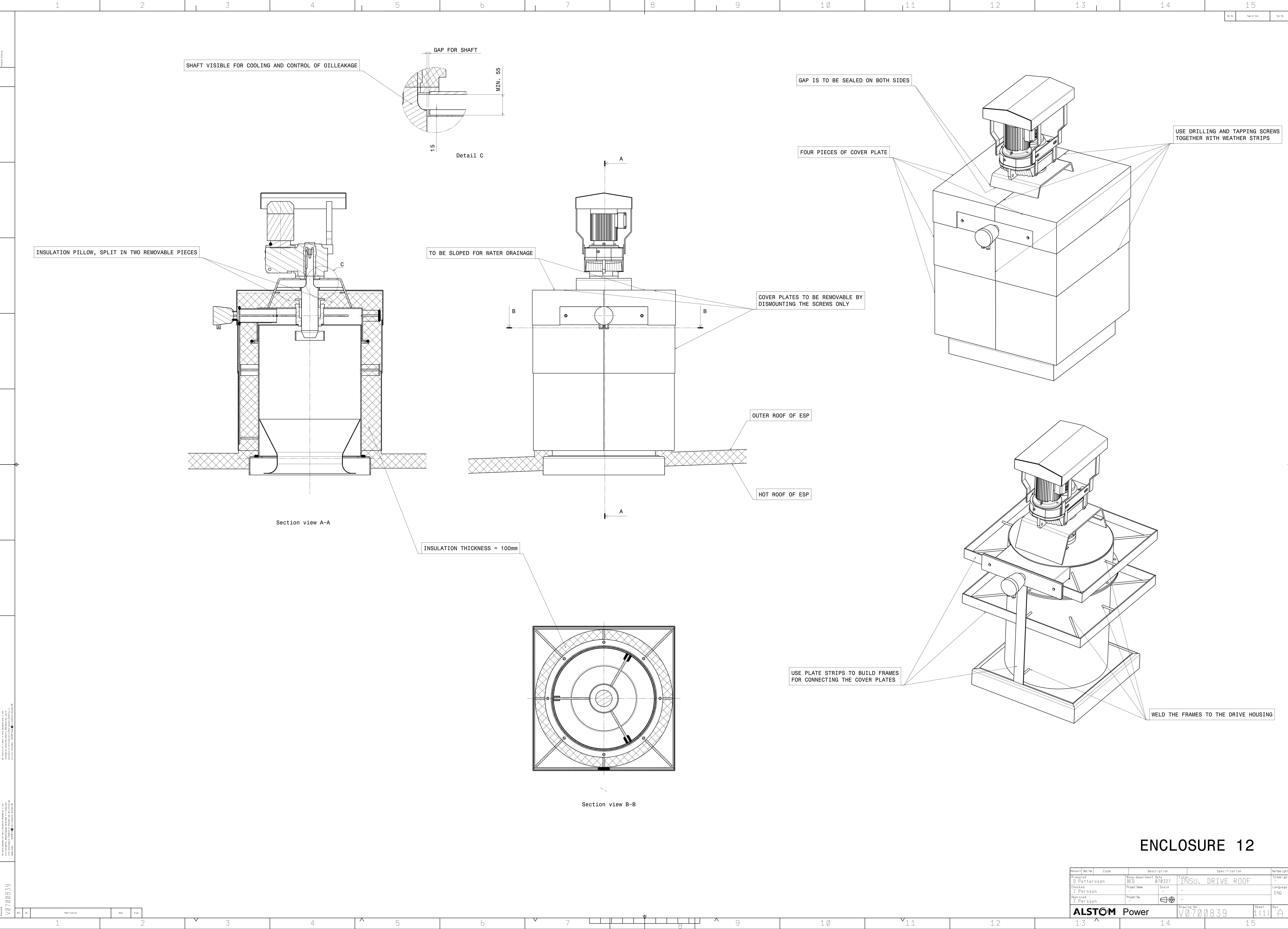
ALT. 4

PRE FABRICATED INSULATION PANELS. FIXED TO EXISTING WALL STIFFERNES.



HOPPER HEATING ARR'T NR 2.

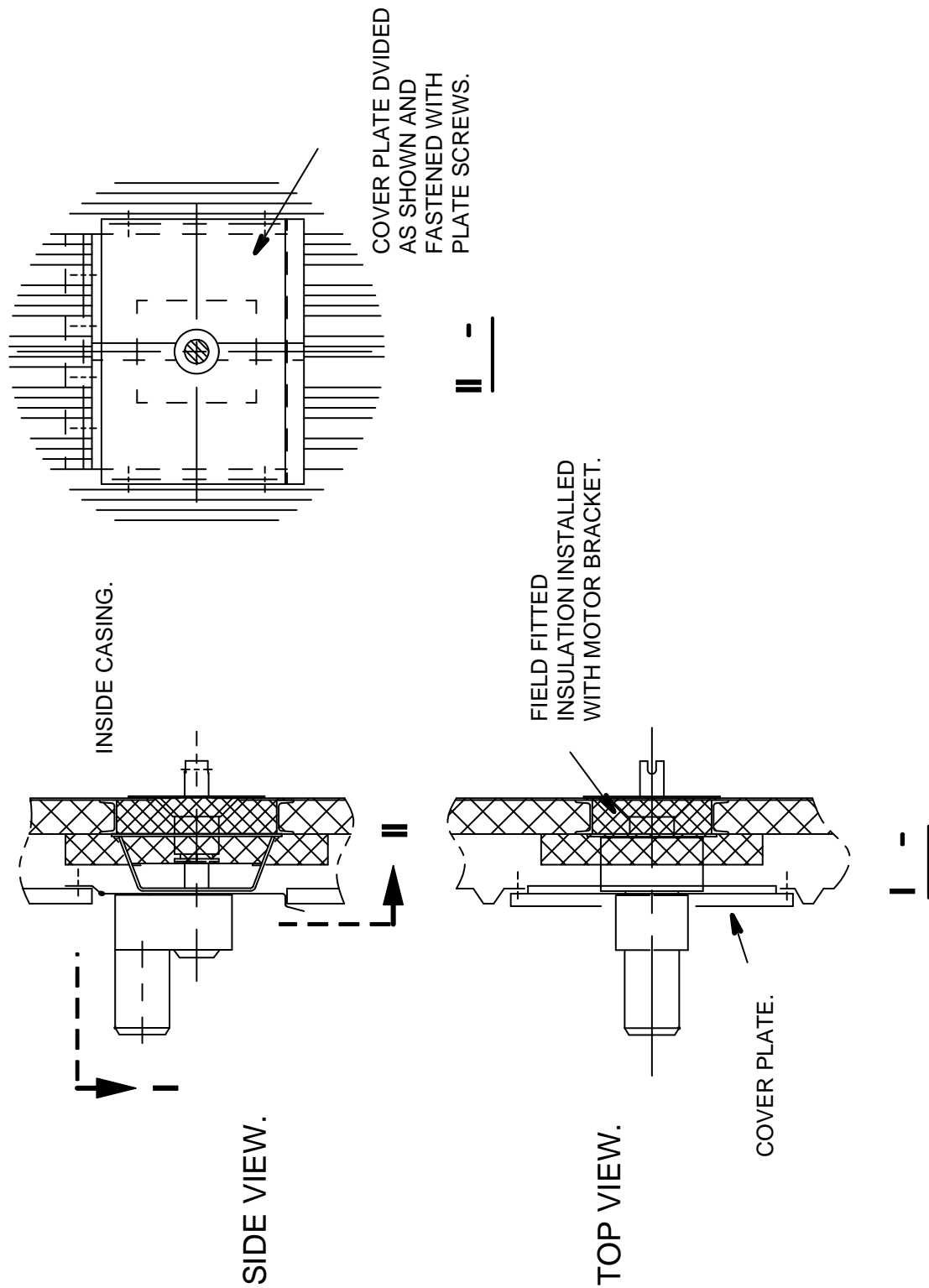




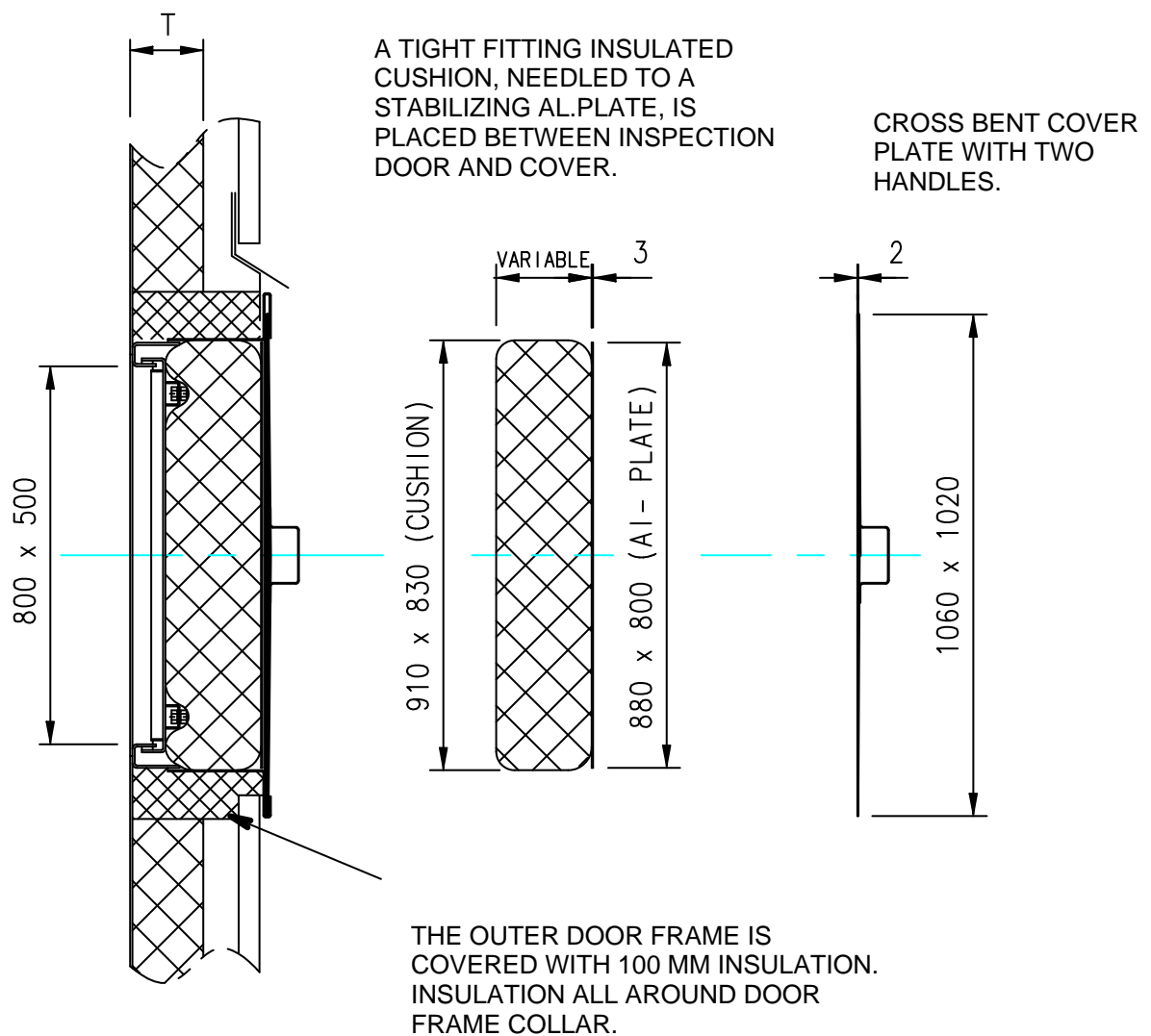
ENCLOSURE 12

Drawn	Rev	Code	Description	Specification	Netweight
Prepared O Pettersson		Req. department BED	Date 870327	Title INSU. DRIVE ROOF	Total weight -
Checked J Persson		Project Name -	Scale -	Language ENG	
Approved J Persson		Project No. -			
Drawing No V0700839					Sheet 1(1)
ALSTOM Power					Rev A

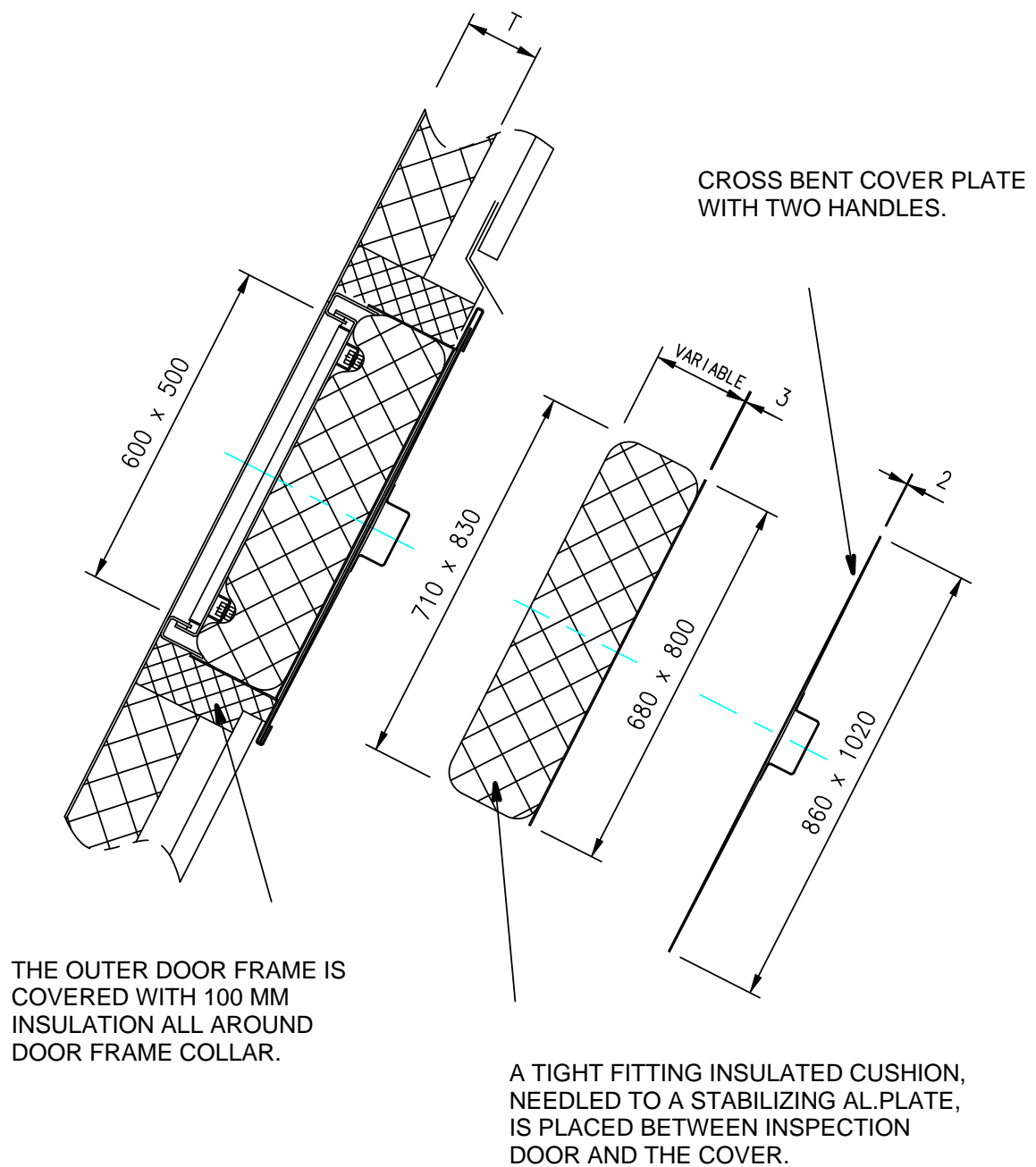
COLLECTING RAPPING DRIVE, SIDE WALL, AND GAS DISTRIBUTION, RAPPING DRIVE.



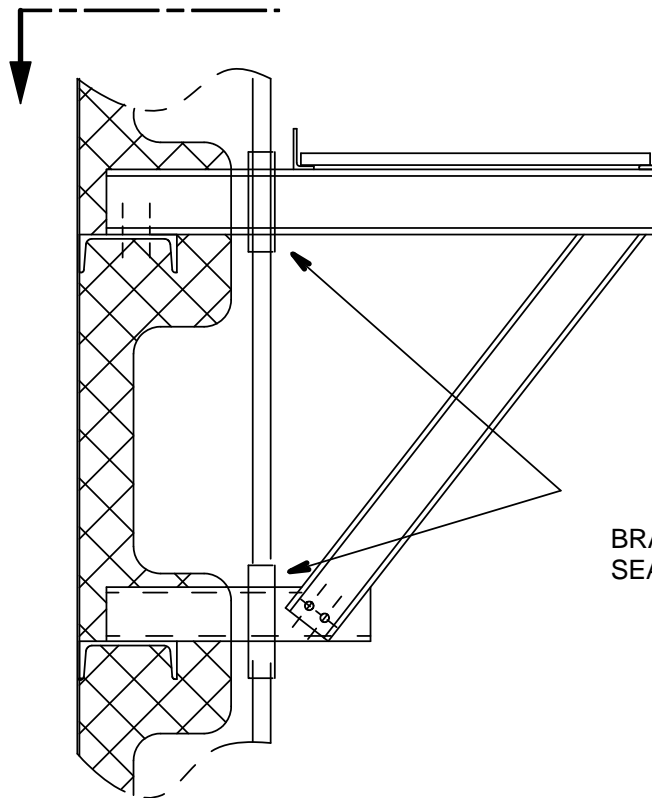
INSPECTION DOOR 500 x 800



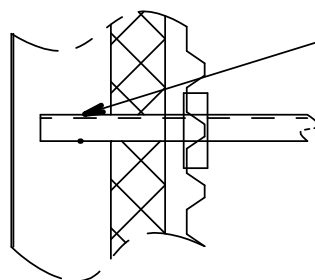
INSPECTION DOOR 500 x 600



PLATFORM- AND STAIR BRACKETS.

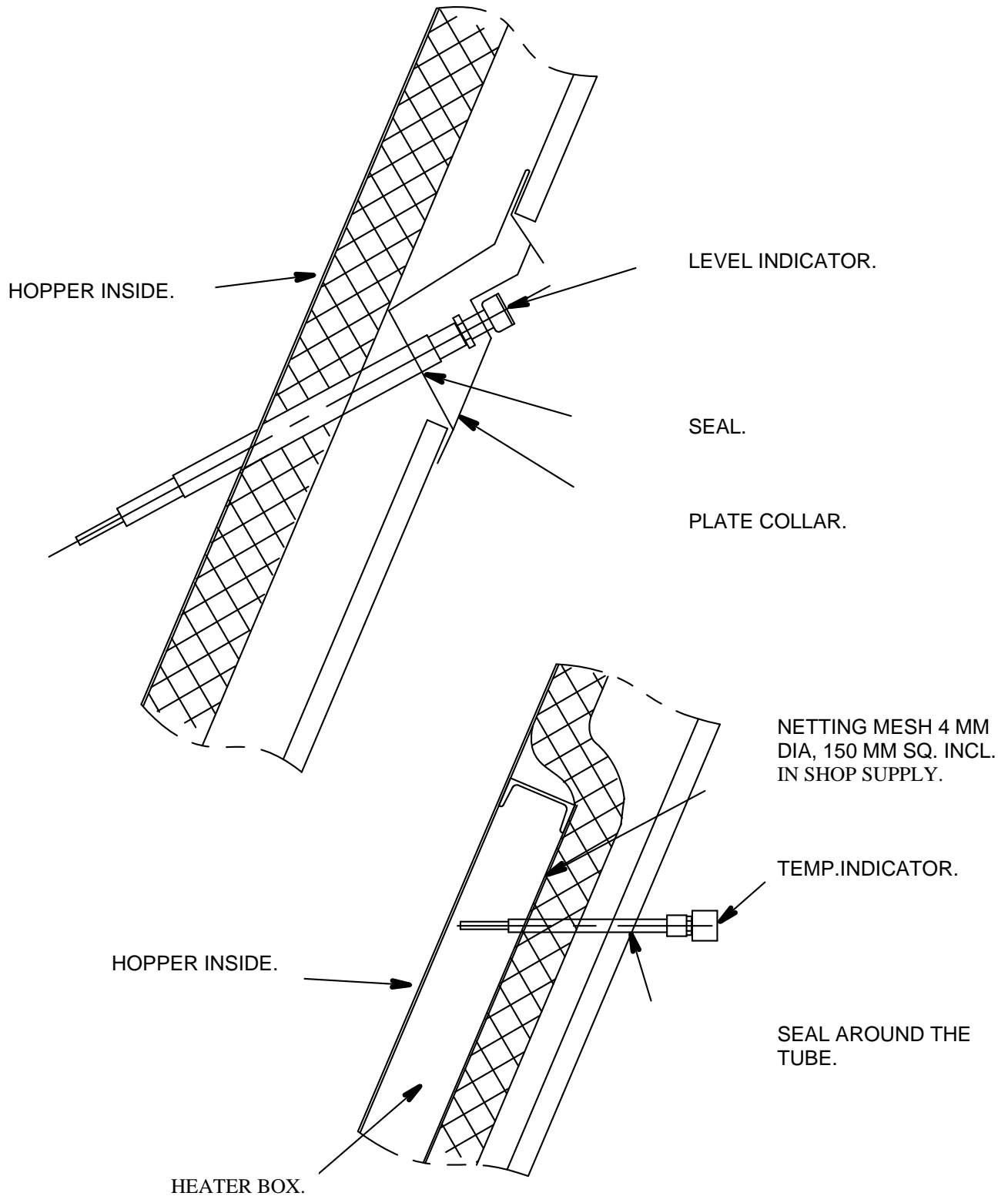


BRACKET PENETRATIONS TO BE
SEALED WITH SEALING MASS.



PLATFORM OR OTHER BRACKETS ARE
NOT DIRECTLY WELDED TO WALL
PLATES BUT TO LOCAL PLATE
STIFFENERS OR VERTICALS
POSITIONED BETWEEN BEAMS TO
CARRY THE BRACKET.

HOPPER LEVEL AND TEMPERATUR INDICATORS.



POKE HOLE.

