CAN/ULC 641:2022

STANDARD FOR FACTORY-BUILT CHIMNEY CONNECTORS AND WALL PASS-THROUGH ASSEMBLIES

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CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE

Standard for Factory-Built Chimney Connectors and Wall Pass-Through Assemblies, CAN/ULC 641

Fourth Edition, Dated April 7, 2022

Summary of Topics

This new edition of CAN/ULC 641 dated April 7, 2022 has been issued to reflect the latest SCC approval dates, and to incorporate the proposals dated April 23, 2021 and July 9, 2021.

The requirements are substantially in accordance with Proposal(s) on this subject dated April 23, 2021 and July 9, 2021.

PLEASE NOTE THAT CERTAIN CODES MAY REFER TO A SUPERSEDED VERSION OF THIS STANDARD. IN THOSE INSTANCES, THE RELEVANT VERSIONS ARE AVAILABLE FOR PURCHASE.

No Text on This Page

CAN/ULC 641:2022

STANDARD FOR FACTORY-BUILT CHIMNEY CONNECTORS AND WALL PASS-THROUGH ASSEMBLIES

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No Text on This Page

CONTENTS

No Text on This Page

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No Text on This Page

PREFACE

This is the Fourth Edition of the Standard for Factory-Built Chimney Connectors and Wall Pass-Through Assemblies, CAN/ULC 641.

This Edition of the Standard has been formally approved by the ULC Standards Committee on Factory-Built Fireplaces, Chimneys and Vents.

This Standard has been developed in compliance with the requirements of SCC for accreditation of a Standards Development Organization.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

This Fourth Edition National Standard of Canada is based on, and now supersedes, the Third Edition of ULC 641.

Attention is drawn to the possibility that some of the elements of this Canadian standard may be the subject of patent rights. ULC Standards shall not be held responsible for identifying any or all such patent rights.

Requests for interpretation of this Standard should be sent to ULC Standards. The requests should be worded in such a manner as to permit a “yes” or “no” answer based on the literal text of the requirement concerned.

This CAN/ULC 641 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

Comments or proposals for revisions on any part of the Standard may be submitted at any time. Proposals should be submitted via a Proposal Request in the On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com/canada.

This Standard is intended to be used for conformity assessment.

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INTRODUCTION

1 Scope

1.1 These requirements apply to factory-built chimney connectors and wall pass-through assemblies that do not require field fabrication.

1.2 The factory-built chimney connectors and wall pass-through assemblies are for use with gas, liquid and solid-fuel-fired residential appliances and building heating equipment where the flue-gas temperatures do not normally exceed 650 °C.

1.3 Factory-built chimney connectors are intended for use inside buildings to form a connection from an appliance to a factory-built chimney suitable for use with solid fuel, or to a masonry chimney.

1.4 The factory-built chimney connectors and wall pass-through assemblies covered by this Standard are intended for installation and use in accordance with the applicable Codes and Regulations as determined by the Authority Having Jurisdiction (AHJ), such as:

a) The National Building Code of Canada;

b) CSA B139 Series, Installation code for oil-burning equipment;

c) CSA B149 Series, Natural gas and propane installation code; and

d) CSA B365 Series, Installation code for solid-fuel-burning appliances and equipment.

2 Reference Publications

2.1 The documents shown below are referenced in the text of this Standard. Any undated reference to a code or standard appearing in the requirements of this Standard shall be interpreted as referring to the latest edition of that code or standard.

2.2 The following publications are referenced in this Standard:

ASTM A653/A653M, *Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process*

CSA C22.2 No. 0.15, *Adhesive Labels*

National Building Code of Canada

UL 969, *Marking and Labelling Systems*

CAN/ULC–S114, *Standard Method of Test for Determination of Non-Combustibility in Building Materials*

3 Glossary

3.1 CHIMNEY CONNECTOR – A pipe assembly that connects a fuel burning appliance to a factory-built chimney or masonry chimney or flue liner for the purpose of carrying gaseous products of combustion from the appliance to the chimney. Intended for use inside buildings.

3.2 COMBUSTIBLE MATERIAL – Material that fails to meet the acceptance criteria of CAN/ULC–S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.

3.3 CLEARANCE – The distance between a wall pass-through assembly, chimney connector, and other surfaces.

3.4 FACTORY-BUILT CHIMNEY – A chimney composed of factory-built components assembled in accordance with its manufacturer's installation instructions to form the completed chimney.

3.5 FLUE LINER – The flue gas conveying component of a venting system.

3.6 MASONRY CHIMNEY – A field constructed chimney of solid masonry units, bricks, stones, listed masonry chimney units, or reinforced portland cement concrete, lined with suitable flue liners built in accordance with applicable Building Code requirements.

3.7 WALL PASS-THROUGH ASSEMBLY – A pipe assembly that provides a transition between a residential appliance chimney connector and the inlet to a masonry chimney or flue liner at a junction where a combustible wall adjacent to the chimney is required to be protected from unsafe temperatures.

CONSTRUCTION

4 Materials

4.1 A chimney connector shall be made of non-combustible corrosion-resistant materials.

4.2 The thickness of sheet metal employed shall not be less than that indicated in Table 4.1, except that sheet metal of lesser thickness may be employed if, upon investigation (consideration being given to the shape, size, and function of the component or subassembly), it is found to have adequate mechanical strength, resistance to corrosion and to be otherwise suitable for the purpose.

Table 4.1
Thickness of Sheet Metal

Minimum thickness of sheet metal (mm)				
Paint coated steel	**Uncoated steel**	**Zinc coated steel**	**Aluminum[a] coated steel**	**Stainless steel**
0.46	1.07	0.46	0.46	0.30
[a] Having a coating of aluminum of 122 g/m^2				
NOTE: The thicknesses given in Table 4.1 are minimums, and greater thicknesses may be required depending upon examination and test of the particular design. Coatings shall remain intact subsequent to Test Nos. 1 – 4.				

4.3 A liner and other parts in contact with flue gases or subject to flue product condensation shall be of material having resistance to corrosion, fire, and heat as determined by Test Nos. 1, 2, 3, 4 and 7.

4.4 Except for binder materials, thermal insulation shall be non-combustible.

4.5 Thermal insulation shall comply with the following conditions when the chimney connector is tested in accordance with these requirements:

a) The products resulting from the combustion or volatilization of any combustible binder shall not be discharged to the space in which the chimney connector is located;

b) The insulating material shall retain sufficient physical strength to remain in its intended position;

c) The thermal conductivity of the insulating material shall not have increased by more than 20 %; and

d) The thermal insulation shall not show evidence of softening, melting, change in physical structure, or other evidence of failure.

4.6 Thermal insulation shall be adequately protected against contact with the products of combustion.

5 Assembly

5.1 A chimney connector or wall pass-through assembly shall consist of all the essential parts necessary for the proper installation of a complete connection, including an adapter for both factory-built chimneys and masonry chimneys. Each part or assembly shall be designed for ready attachment of one to the other without requiring alteration, cutting, threading, drilling, crimping, or similar task by the installer; except that a special assembly or part designed to be cut to length or to fit by the installer may be provided if means, such as bolts or sheet metal screws, are furnished for readily joining any altered part to a companion part or assembly.

5.2 Two or more parts or subassemblies, which must bear a definite relationship to each other for proper and safe use, shall be arranged and constructed to permit them to be incorporated into the complete assembly, without need for alteration or alignment, only in the correct relationship with each other; or such parts or subassemblies shall be assembled and shipped from the factory as one element.

5.3 Each part (such as a chimney connector section or length, elbow, or adapter) shall be completely assembled by the manufacturer at the factory.

5.4 A wall pass-through assembly section comprised of a liner, formed insulation or other intermediate assembly, and an outer jacket, which are separable, is to be pre-assembled and packaged as one unit. In such cases, each separable part is to be completely formed, including the joining of all seams.

5.5 A chimney connector or wall pass through assembly, when installed in accordance with the manufacturer's instructions, shall be positioned securely, resistant to damage from both external and internal forces, and stable.

5.6 A clean-out tee or removable section shall be available for each assembly.

6 Joints

6.1 Parts of a chimney connector shall be joined in a manner to prevent disengagement when tested in accordance with these requirements. [See Test No. 5 – Strength (Chimney Connectors)].

6.2 A joint, when assembled in accordance with the manufacturer's instructions, shall be reasonably gastight.

6.3 A joint shall not reduce the cross sectional area of the connector by more than 5 %.

6.4 A joint shall not retain condensation nor permit condensation to flow from the interior to the exterior of the chimney connector.

PERFORMANCE

7 General

7.1 When a chimney connector or wall pass-through assembly is tested in accordance with these requirements, allowable temperature rise limitations to combustible construction shall be maintained. No

part shall attain a temperature sufficient to damage required corrosion protection, nor cause creeping, distortion, or sagging damage; resistance to damage by handling shall be demonstrated.

7.2 Test Nos. 1 – 8 shall be conducted on each test installation and Test Nos. 1 – 4 shall be conducted in the sequence presented.

8 Test Installation

8.1 A chimney connector or wall pass-through assembly shall be tested on the following basis:

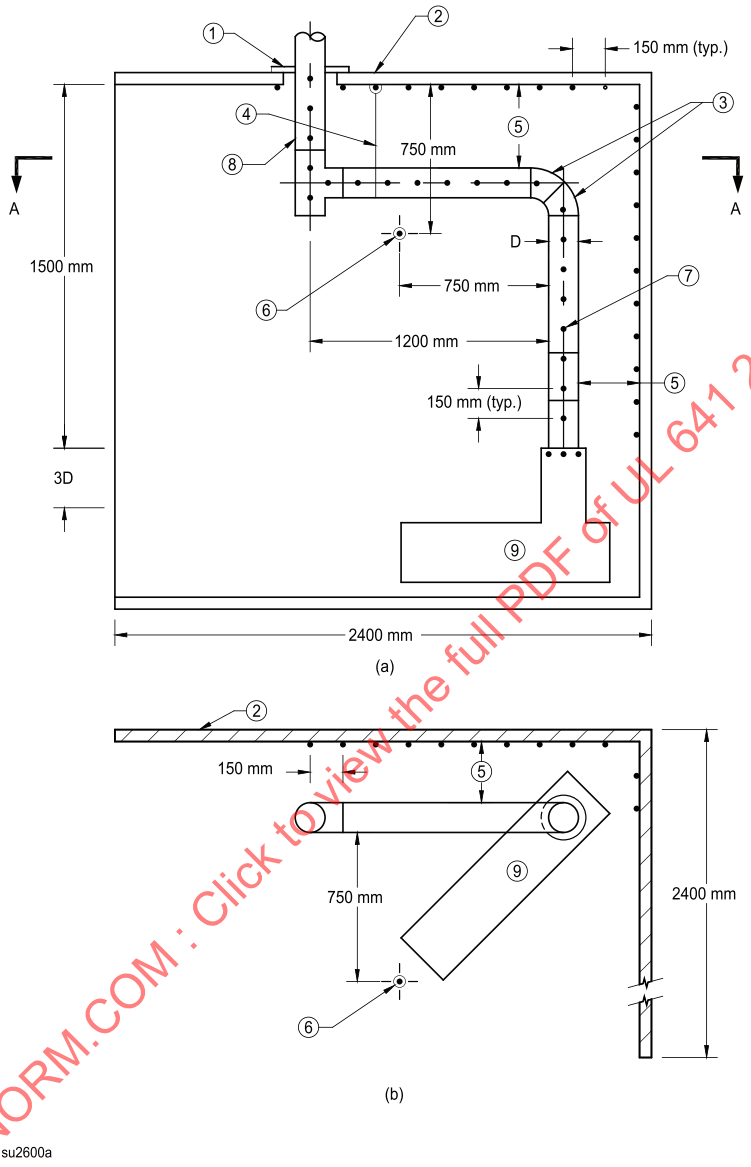
a) Size and kind; and

b) Minimum clearance to combustible construction.

8.2 The test structure and test sample chimney connector installation shall be as illustrated by Figure 8.1. A wall pass-through assembly shall be installed for testing in accordance with Figure 8.2. Where a wall pass-through assembly is designed for use in an interior combustible dividing wall, it shall be installed for testing in accordance with Figure 8.3.

Figure 8.1

Typical Test Installation – Chimney Connector



(a) – Elevation View

(b) – Section 'A-A'

1 – Noncombustible material

2 – 19 mm plywood (inside surface painted matte black)

3 – Two 45° elbows

4 – Hanger support

5 – Minimum clearance

6 – Ambient temperature thermocouple

7 – Line of thermocouples behind pipe

8 – Chimney connector

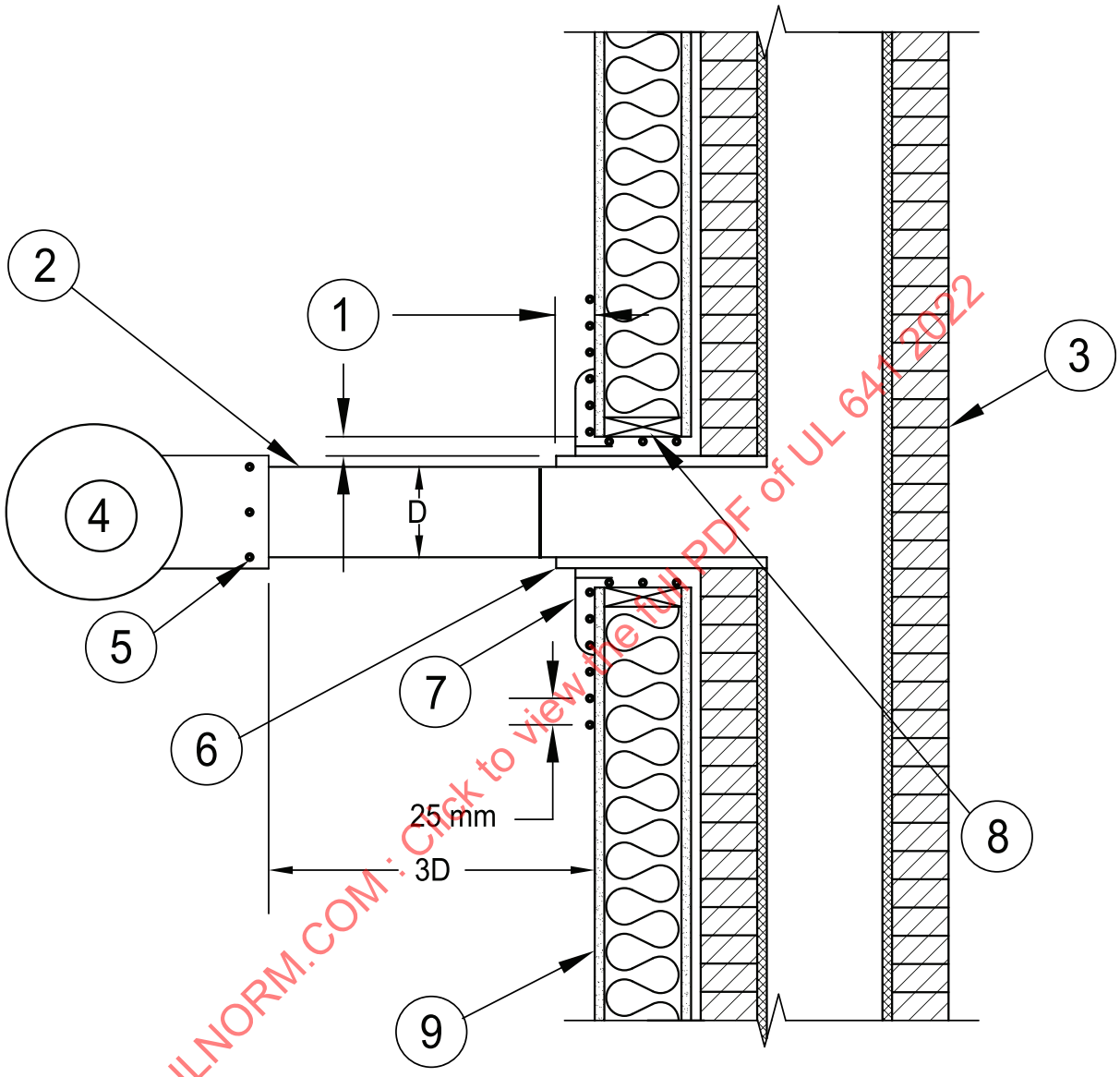
9 – Flue gas generator

D – Diameter of connector

• – Thermocouple locations

Figure 8.2

Typical Test Installation Through a Combustible Wall Into a Masonry Chimney



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1 – Minimum clearance as specified by manufacturer

2 – Chimney connector

3 – Masonry chimney

4 – Flue gas generator

5 – Flue gas thermocouples

6 – Wall pass-through assembly

7 – Face shield

8 – Inside surface painted matte black

9 – Wall section outside painted matte black

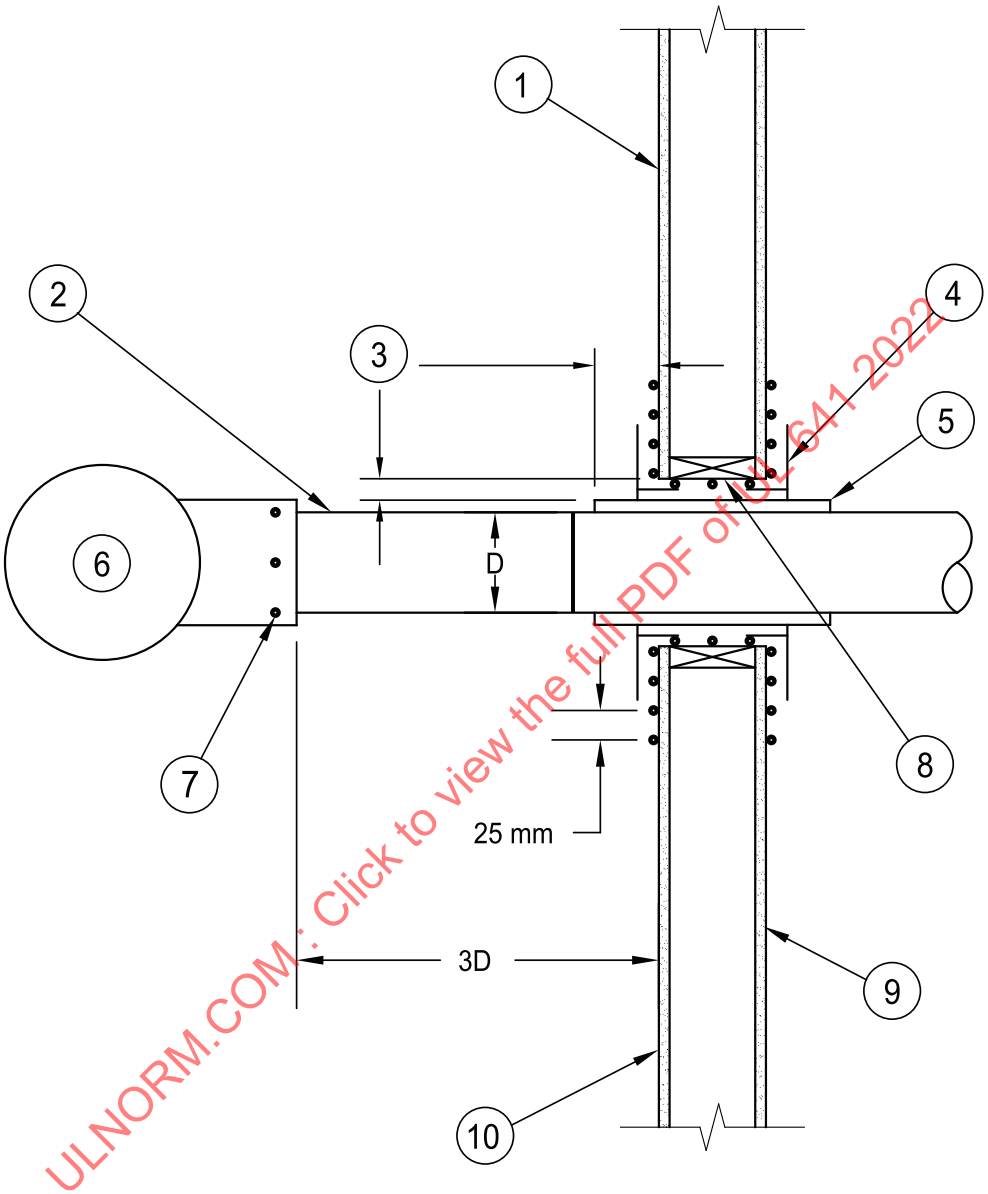
D – Diameter of connector

• – Thermocouple locations

NOTE: Frame wall section to consist of a 1200 mm panel framed with 38 x 184 mm studs and header. Wall penetration to be framed-in on all four sides at minimum spacings recommended by the manufacturer and maintained by factory supplied spacers. Panels to be insulated with RSI-4.4 fibreglass and clad with 19 mm plywood. Masonry chimney to be constructed in accordance with the National Building Code of Canada.

Figure 8.3

Typical Test Installation Through an Interior Combustible Dividing Wall



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1 – Painted matte black

2 – Chimney connector

3 – Minimum clearance as specified by manufacturer

4 – Firestop spacer

5 – Wall pass-through assembly

6 – Flue gas generator

7 – Flue gas thermocouple

8 – Inside surface painted matte black

9 – 19 mm plywood painted matte black

10 – Wall section

D – Diameter of connector

• – Thermocouple locations

8.3 Tests shall be conducted as described in 8.4 – 8.8 on a chimney connector or wall pass-through assembly of each design. If the chimney connector or wall pass-through assembly is manufactured in more than one size, tests shall be conducted on as many sizes as may be deemed necessary to determine conformance with these requirements. Where telescopic sections, special adapters or other flue gas conveying components are provided, they shall be included in the test structure in accordance with their intended use.

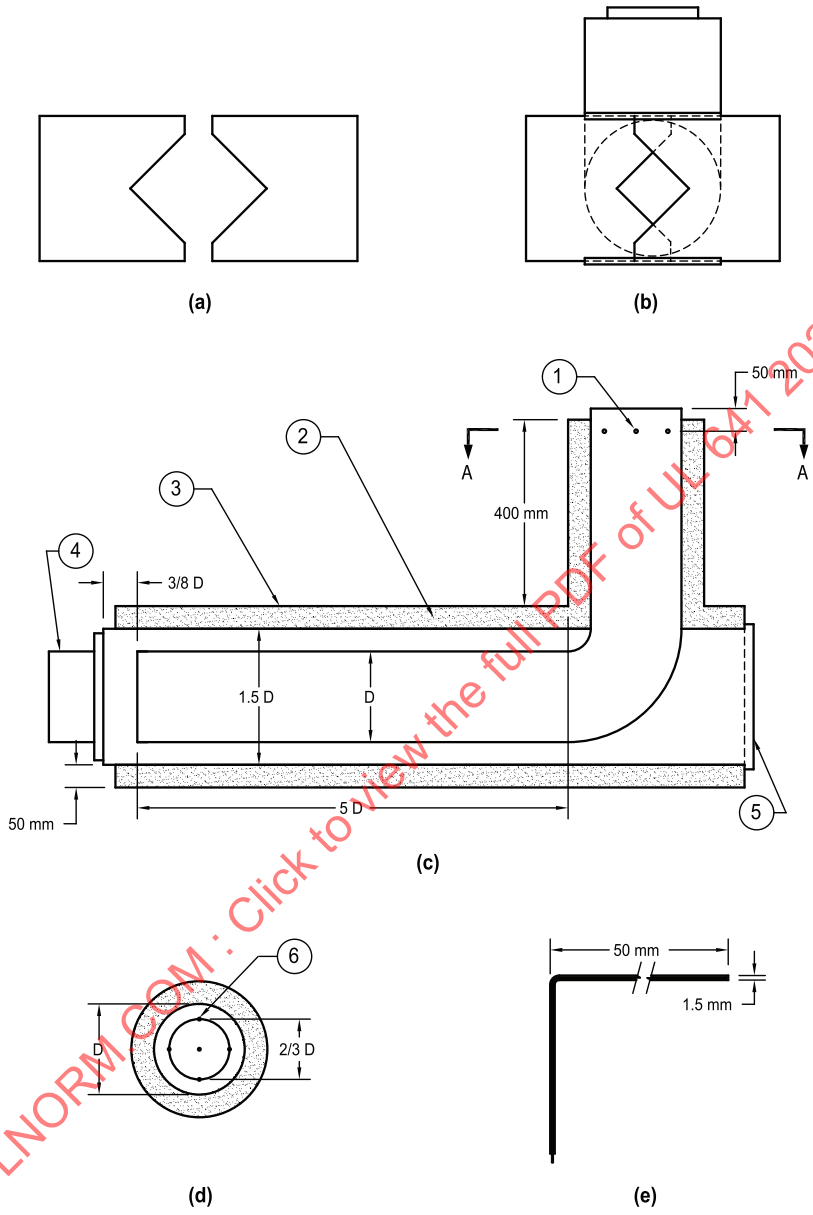
8.4 The test structure shall be erected within a room that is reasonably free of drafts, and the chimney to which the chimney connector or wall pass-through assembly is connected is to exhaust into the same space or into a space freely communicating with that from which the combustion air is taken. The room shall be such that during any one test, the room temperature does not increase more than 20 °C above the room temperature at the beginning of the test.

8.5 A chimney connector or wall pass-through assembly shall not be designed for taking air from an occupied space and exhausting such air to the outside of a building to cool the pipe, or the reverse.

8.6 A gas-fired flue-gas generator as illustrated by Figure 8.4 shall be used to supply flue gases to the chimney connector or wall pass-through assembly being tested. The generator shall be capable of producing flue gases at the specified test temperatures when fired at the test input specified in Table 8.1.

Figure 8.4

Flue Gas Generator



(a) – Air shutter detail

(b) – Rear end view

(c) – Cross-section through generator

(d) – Section 'A-A'

(e) – Typical shielded thermocouple

1 – Location of flue gas thermocouples

2 – Ceramic wool type insulation

3 – Stainless steel or aluminum jacket

4 – Burner mount

5 – Air shutter

6 – Shielded thermocouples

D – Approximate diameter of test chimney

Table 8.1
Flue-Gas Generator Inputs

Equivalent nominal diameter of chimney connector or wall pass-through assembly	Input to flue-gas generator kilowatts			
mm	Column 1	Column 2	Column 3	Column 4
152	28.4	15.6	51.2	8.8
178	38.6	21.2	69.4	11.7
203	50.5	27.8	91.0	15.2
229	63.9	35.1	115.0	19.3
254	79.1	43.5	142.4	24.0

8.7 The flue-gas generator is to be located as shown in Figure 8.1, Figure 8.2 or Figure 8.3, as applicable, with the connection to the test chimney connector or wall pass-through assembly insulated.

8.8 The chimney connector shall connect to the chimney at the ceiling. For test purposes, where the chimney connector pierces the ceiling, an opening having a clearance as specified in the manufacturer's installation instructions shall be cut and the chimney connector centred in the opening. The annulus thus formed shall be sealed with non-combustible material 3 mm in thickness, placed on the exterior surface.

9 Temperature Measurement

9.1 Temperature measurements shall be in accordance with 9.2 – 9.10.

9.2 For purposes of determining temperature rise on chimney connector or wall pass-through assembly parts and on enclosure walls and ceiling, the temperatures of such are to be referenced to ambient temperatures below the ceiling.

9.3 The inlet flue-gas temperature is to be determined for Test Nos. 1 – 4 by a 5-thermocouple grid located within the insulated outlet of the flue-gas generator, as illustrated by Figure 8.4. The thermocouples are to be Type K (chromel-alumel) of 0.51 mm diameter with untwisted welded bead junctions of minimum size (not over 1.27 mm) enclosed in a suitable sealed tube of inside diameter of approximately 1.5 mm.

9.4 The gas burner is then to be operated as for Test No. 2, and the dilution air is to be regulated so that the average temperature indicated by the thermocouple grid is approximately 625 °C above room temperature, using the flue-gas generator input shown in Column 2 of Table 8.1, for the size of chimney connector or wall pass-through assembly under test.

9.5 The dilution air adjustments for Test Nos. 1 – 4 are to be set as necessary to obtain the specified flue-gas temperatures for the individual test as measured by the thermocouples located as described above.

9.6 Temperatures on combustible surfaces are to be measured by Type J (iron-constantan) thermocouples not greater than 0.51 mm diameter. For structural elements in contact with chimney connector or wall pass-through assembly parts, junctions of thermocouples are to be placed on the chimney connector or wall pass-through assembly part surfaces, except that, where a point or line contact of a spacer, not over 3 mm diameter or width, is made, thermocouples are to be placed on the test structure at points 12 mm from the centre line of such point or line contact. Thermocouples are to be attached to structural elements adjacent to the chimney connector or wall pass-through assembly, so as to have 12 mm of wire exposed and be secured by staples over the insulated portions of the wires. The junctions are to be depressed flush with the surface and held in thermal contact with the surface by 50 mm black cloth adhesive tape.

9.7 The temperatures attained by parts of the chimney connector or wall pass-through assembly are to be obtained by means of thermocouples applied to assure good thermal contact with the parts. Thermocouples to be attached to surfaces of metal parts are to have junctions welded, brazed, silver-soldered, or screwed to the surface, as appropriate for the expected temperatures. Thermocouples to be attached to surfaces of nonmetallic parts are to have the junction and at least 25 mm of the lead wires embedded flush with the surface of the material. Furnace cement is to be smoothed over such indentations to assure thermal contact. Such thermocouples are to be located at points attaining maximum temperatures. Additional thermocouples may be placed at other locations as deemed necessary.

9.8 The room or ambient temperature is to be obtained by a shielded thermocouple located centrally within a 150 mm length of aluminum-painted 60.3 mm outside diameter steel pipe, open at both ends. Ambient temperatures are to be determined by a shielded thermocouple located as shown in Figure 8.1 for a chimney connector. The shield is to be placed in a manner to avoid direct radiation to the thermocouple.

9.9 Ambient temperatures for a wall pass-through assembly are to be determined by shielded thermocouples located 600 mm on each side of the centreline of the wall pass-through assembly and spaced 300 mm from the wall. The two ambient temperatures are to be averaged for the wall pass-through assembly temperature tests.

9.10 During Test No. 3, temperature rises are to be based on the ambient or room temperature recorded at the end of the firing period prescribed for the test.

9.11 Typical thermocouple layouts are indicated in Figure 8.1 and Figure 8.2. It may be necessary to use additional thermocouples depending upon the design and method of installation.

10 Test No. 1 – Thermal Shock

10.1 The temperature of the flue gases entering the test chimney connector or wall pass-through assembly is to be regulated by the quantity of primary and secondary air induced into the generator when the flue-gas generator is fired at the specified input. Combustion is to be completed within the combustion chamber of the flue-gas generator. The generator connector pipe is to be insulated for a distance of 3 diameters from the test chimney connector or wall pass-through assembly inlet.

10.2 The test is to be started with the test chimney connector or wall pass-through assembly and the test structure at room temperature. The flue-gas generator is to be fired to at least an input as specified in Column 1, Table 8.1, and regulated to produce flue gases at a temperature of 900 °C above room temperature at the flue-gas thermocouple location shown in Figure 8.4. The test is to be continued for a period of 10 min, exclusive of the time taken to reach 900 °C, which shall not exceed 15 min, at which time the burner is to be shut off.

10.3 This test is to be conducted three times, starting from room temperature in each case and allowing the chimney connector or wall pass-through assembly to cool either to room temperature or for a period of 4 h, whichever occurs first, before the next trial.

10.4 No temperature readings other than flue-gas temperature need be recorded for the three tests described in 10.3.

10.5 At the conclusion of this test, the interior of the chimney connector or wall pass-through assembly is to be visually inspected throughout its entire length. The test series is to be continued only if obvious cracks, distortion, or other damage are not evident.

11 Test No. 2 – Temperature – 650 °C Flue Gases

11.1 The test is to be started with the test chimney connector or wall pass-through assembly and the test structure at room temperature. The flue-gas generator is to be fired at the input given in Column 2 of Table 8.1, and regulated to produce flue gases at a temperature of 625 °C above room temperature at the location designated in Figure 8.4. The test for compliance with the requirements of 11.2 is to be continued until equilibrium temperatures are attained on surfaces of the test chimney connector or wall pass-through assembly parts and the test enclosure. The generator connector pipe is to be insulated for a distance of 3 diameters from the test chimney connector or wall pass-through assembly inlet as illustrated in Figure 8.1, Figure 8.2 or Figure 8.3, as applicable.

11.2 The maximum temperatures on surfaces of the test structure (ceiling, wall sections, etc.) shall not be more than 65 °C above room temperature when the flue-gas temperature is maintained as described in 11.1, nor after the generator has been shut off. The temperature rise of any part of the connector shall not exceed the maximum specified in Column 1 of Table 11.1, for the materials used.

Table 11.1
Maximum Temperature Rises for Some Materials[a]

Material	Maximum temperature rise above room temperature	
	Column 1 °C	Column 2 °C
Low-carbon steel, cast iron	460	515
Aluminum alloys –		
1100 (2S)	185	240
3003 (3S)	240	295
2014, 2017, 2024, 5052[b]	295	350
Aluminum-coated steel		
Heat-resistant type[c]	570	710
Stainless steel –		
Types 302, 303, 304, 321, 347	685	765
Type 316	665	745
Type 309S	865	945
Types 310, 310B	895	975
Type 430	730	810
Type 446	960	1040
Galvanized steel[d]	265	350
Carbon steel-coated with Type A19 ceramic	570	630

[a] The specified maximum temperature rises apply to parts whose failure may cause the chimney connector or wall pass-through assembly to be unsafe for use.

[b] These and other alloys containing more than 1.0 % magnesium are not to be used if the reflectivity of the material is used to reduce a fire hazard.

[c] When the reflectivity of aluminum-coated steel is used to reduce a fire hazard, the maximum allowable temperature rise is 460 °C.

[d] The specified maximum temperature rises apply when the galvanizing is required as a protective coating or the reflectivity of the surface is utilized to reduce a fire hazard.

NOTE: The inclusion of a temperature limit for a material in this table is not indicative of the acceptability of the material if it does not otherwise conform to the requirements of this standard.

12 Test No. 3 – Temperature – 925 °C Flue Gases

12.1 After equilibrium temperatures are attained under the test conditions described in 11.1, the flue-gas generator is to be fired at the input given in Column 1 of Table 8.1, and regulated to produce flue gases at a temperature of 900 °C above room temperature at the location designated in Figure 8.4 and the test continued for 30 min. The generator connector pipe is to be insulated for a distance of 3 diameters from the test chimney connector or wall pass-through assembly inlet as illustrated in Figure 8.1, Figure 8.2 or Figure 8.3, as applicable.

12.2 The maximum temperature attained on surfaces of the test structure (ceiling, wall sections, etc.) shall not be more than 78 °C above room temperature when the flue-gas temperature is maintained for 30 min as described in 12.1, nor after the generator has been shut off. The temperature rise of any part of the chimney connector or wall pass-through assembly shall not exceed the maximum temperature specified in Column 2 of Table 11.1 for the materials used. The room temperature shall be the temperature as measured at the end of the 30 min firing period.

13 Test No. 4 – Temperature – Creosote Burnout

13.1 The test is to be started with the test chimney connector or wall pass-through assembly and the test structure at room temperature.

13.2 The test conditions are then to be established at the inputs shown in Column 4 of Table 8.1, and maintained to produce flue gases at a temperature of 300 °C above room temperature and the operation continued until equilibrium temperatures are attained on surfaces of chimney connector or wall pass-through assembly parts and the test structure.

13.3 After equilibrium temperatures are attained under the test conditions described in 13.2, the input to the flue-gas generator is to be increased to that given in Column 3 of Table 8.1, and regulated to produce a temperature of 1125 °C above room temperature at the location designated in Figure 8.4. The test period shall be for 10 min, exclusive of the time taken to reach the 1125 °C temperature rise, which shall not exceed 5 min. At the end of the test period the burner is to be shut off.

13.4 This test is to be repeated for a total of three cycles. The test is to be conducted with the generator connector pipe insulated for a distance of 3 diameters from the test chimney connector or wall pass-through assembly inlet as illustrated in Figure 8.1, Figure 8.2 or Figure 8.3, as applicable.

13.5 After being tested in accordance with Test Nos. 1 – 4, a chimney connector or wall pass-through assembly shall be safe for further use.

13.6 Results indicating conformance with 13.5 include the following:

a) No part of the chimney connector or wall pass-through assembly has become damaged or permanently distorted to an extent that it or the chimney will not continue to function as intended;

b) A ceramic material does not show evidence of cracking, disintegration, nor spalling, to an extent that impairs the use of the part of an assembly;

c) Cracks are not observable in porcelain enamel used as a required protective coating when the surface is examined under a microscope of 60 X magnification;

d) The reflectivity of a surface has not been impaired when the reflectivity of such surface is utilized to reduce fire hazard;

e) Burning or scaling of metal parts is not evident by visual observation; and

f) The effectiveness of insulating material has not been reduced as per 4.5(c).

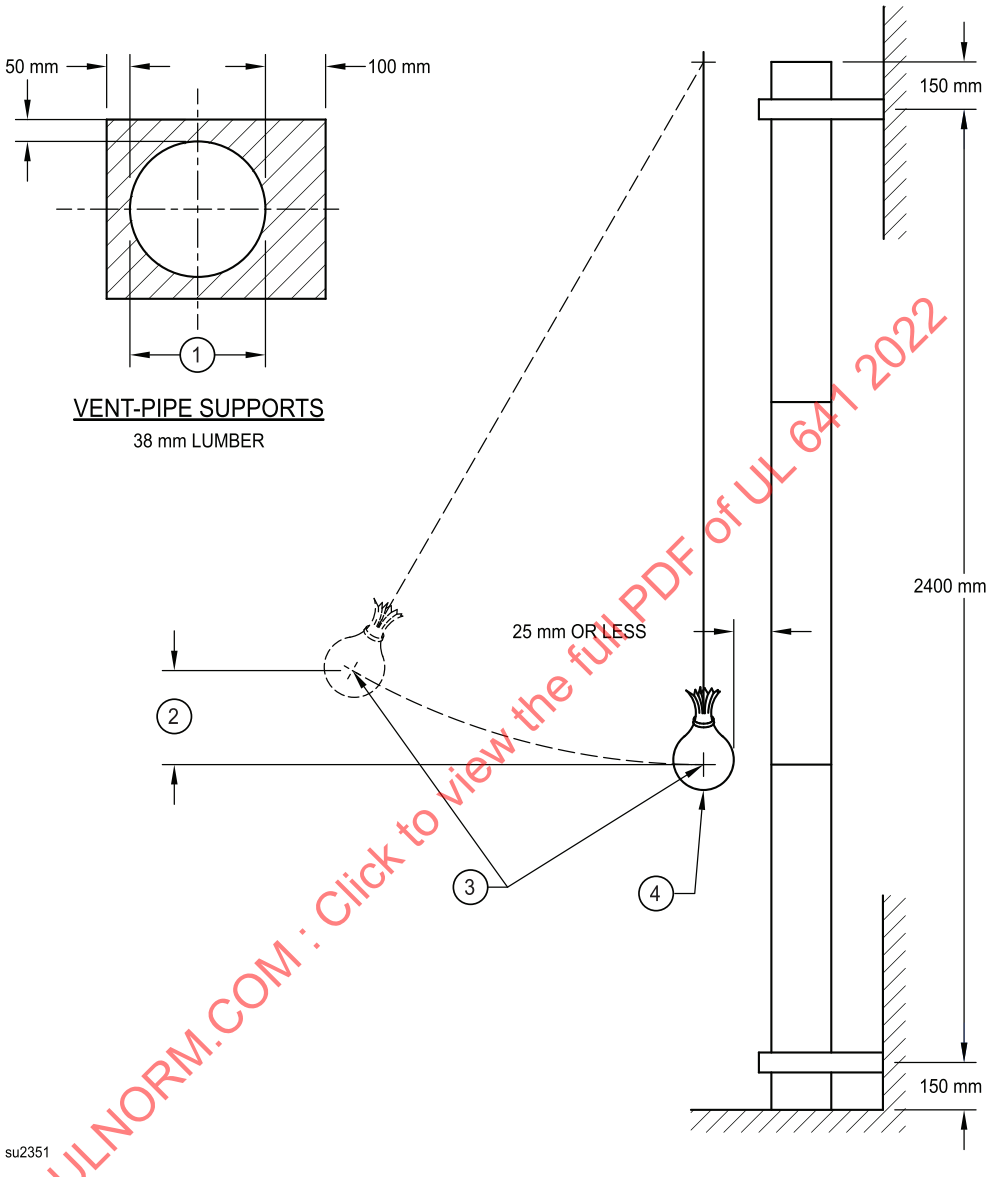
14 Test No. 5 – Strength (Chimney Connector)

14.1 A chimney connector, elbow or tee, shall not open up, break apart, nor become damaged sufficiently to cause it to be unsafe for use when subjected to impacts of a sand bag pendulum released from designated distances away from its vertical at-rest position when tested in accordance with the method described in 14.2 – 14.5.

14.2 The impact is to be applied to chimney connector lengths installed as shown in Figure 14.1 and Figure 14.2 for a tee and Figure 14.3 for an elbow. Tests are to be made on a sufficient number of assemblies to include representative samples of each size section and arrangement intended to be joined together as furnished by the manufacturer.

Figure 14.1

Strength Test – Chimney Connector



Impact Table

Inside diameter of connector	Mass of sand bag	Elevation of sand bag
300 mm or less	9 kg	230 mm
Over 300 mm	23 kg	460 mm

1 – Outside diameter of connector + 6.0 mm

2 – Elevation of sand bag

3 – Centre of gravity of sand bag

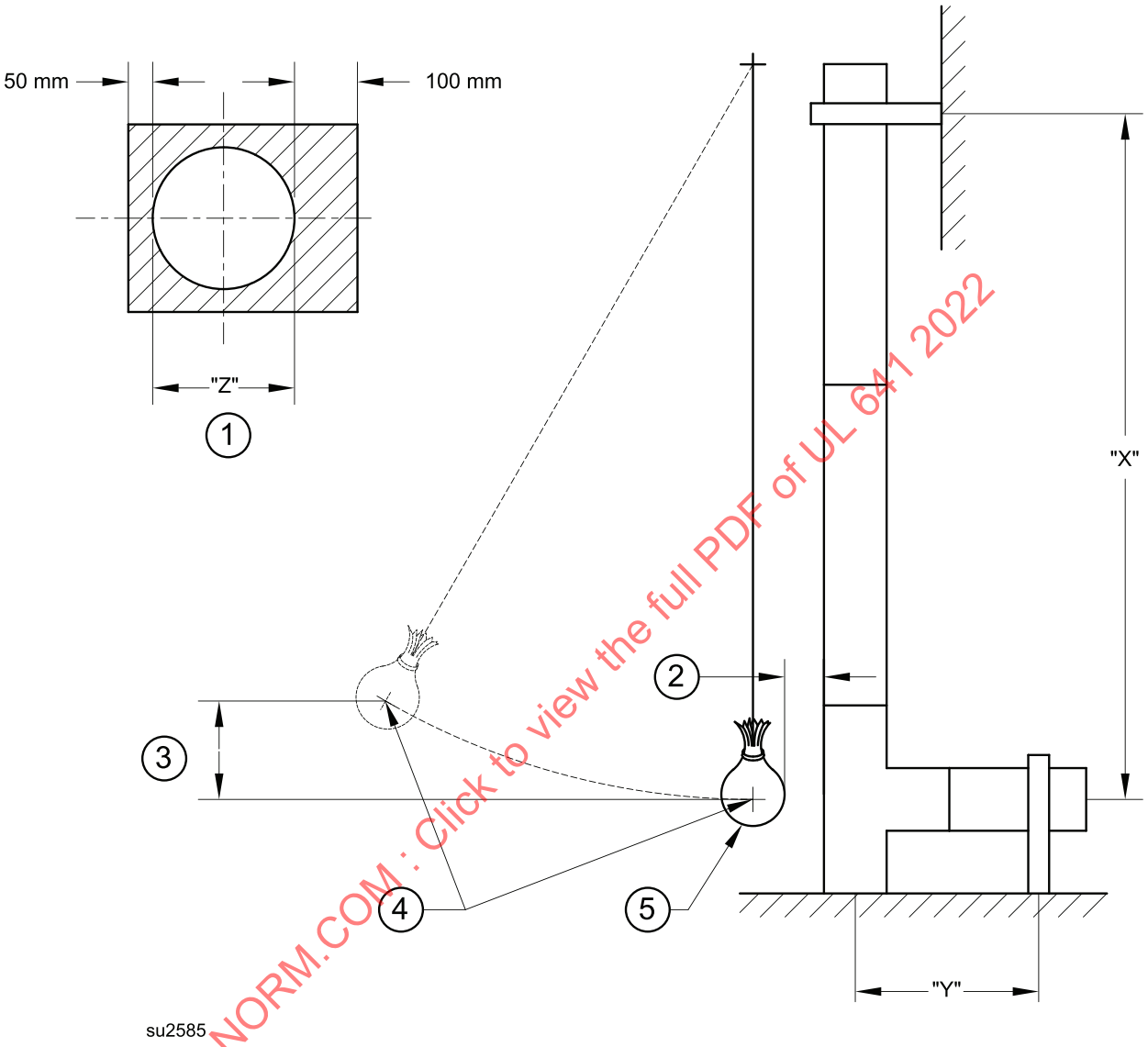
4 – Sand bag

5 – Vent-Pipe Supports 38 mm Lumber

6 – 25 mm or less

Figure 14.2

Strength Test – Chimney Connector Tee



Impact Table

Inside diameter of connector	Mass of sand bag	Elevation of sand bag
300 mm or less	9 kg	230 mm
Over 300 mm	23 kg	460 mm

1 – Supports – 38 mm lumber

2 – 25 mm or less

3 – Elevation of sand bag

4 – Centre of gravity of sand bag

5 – Sand bag

“X”, “Y” – As per manufacturer’s installation instructions

Z – Outside diameter of connector + 6.0 mm