

**IGEM/UP/10 Edition 4  
COMMUNICATION 1774  
2014**

The following Amendments (March 2016) apply to all copies of IGEM/UP/10 Edition 4 published in 2014.

**Clause 2.1 Delete Note 4. Substitute:**

➤

*Note 4: The ratio of gross to net heat input is, approximately, 1.11:1, 1.09:1 and 1.08:1 for appliances on Natural Gas (NG)/Towns Gas, propane and butane respectively. For the purposes of this Standard, where gross heat inputs represent requirements of existing standards, they are converted to net using a conversion factor in all cases. For example, 600 kW gross heat input =  $600 \div 1.1 = 545$  kW net heat input for NG. ◀*

**Clause 3.2.4 Delete all paragraphs. Substitute:**

➤

These Regulations impose duties on designers, clients (and their agents), developers, principal designer and principal contractors. Further information is given in L153, which sets out the principles duty holders are required to use in their approach to identifying the measures they need to take to control the risks to health and safety in a particular project.

The general principles of prevention are to:

- avoid risks where possible
- evaluate those risks that cannot be avoided, and
- put in place proportionate measures that control them at source.

Construction includes the alterations, repair, re-decoration, maintenance, de-commissioning or demolition of a structure. It also covers installation, commissioning, maintenance or removal of gas services. ◀

**Clause 3.2.10.6 Delete text in clause. Substitute:**

➤ The installer is required to check the safety of any appliance or pipework they install or work on and take appropriate action where they find faults. Where the premises are let or hired out, the landlord or hirer has special responsibilities to ensure that any installer they use for the gas fitting, service or maintenance or safety is a member of an approved class of persons (see clause 3.2.10.5) and is competent to carry out such work. If any serious fault is found, the installer is required to inform both the landlord/hirer, as well as the user, so that such faults can be rectified before further use. ◀

**Clause 5.1.6 Delete all paragraphs. Substitute:**

➤

Appliances shall be located on suitable structures that can safely withstand their weight (including any water or thermal fluids) at a temperature specified by the appliance manufacturer.

For appliances containing liquids, the selected location shall, as necessary, incorporate means to safely drain and dispose of any liquids that might be released during maintenance, from leaks, due to condensation, from condensate etc. ◀

**Clause 7.1.1**

**Add Note 4:**

➤  
Note 4: The ventilation requirements in this Standard relate to the safe operation of appliances. Ventilation may also be needed under DSEAR for gas pipework (see IGEM/UP/2 and IGEM/UP/11). In the majority of cases, this is provided by the appliance ventilation, however high level ventilation may always be required. ◀

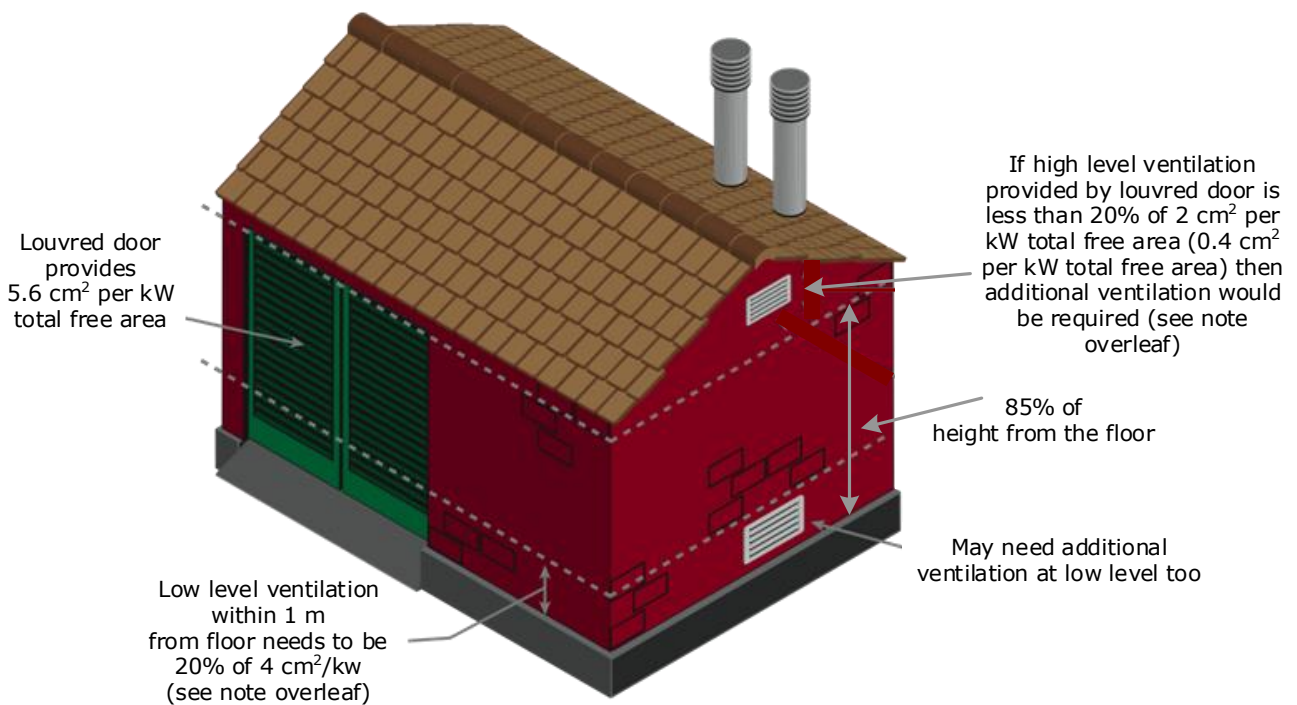
**Clause 7.1.8**

**Add a Note:**

➤  
Note: For ventilation of school buildings further guidance is provided by Guidance on ventilation, thermal comfort, and indoor air quality in schools DfE, previously Building Bulletin 101. ◀

**FIGURE 2 Delete entire Figure. Substitute:**

➤



**FIGURE 2 – EXAMPLE OF VENTILATION DISTRIBUTION FOR A PLANT ROOM WITH LOUVRED DOORS AND VENTILATION ◀.**

**TABLE 2 Delete Note 3 entirely and substitute:**

➤  
Note 3: Where a boiler installation is occupied for example by boiler operators and is to operate in summer months, for example domestic hot water heating, the above allowance ought to be sufficient, provided that it does not operate for more than 50% of the time. If the boiler installation is to operate at a higher percentage of the time, increased ventilation will be required. For example, at 75%, an additional 720 m<sup>3</sup> per hour per 1000 kW and, at 100%, an additional 1350 m<sup>3</sup> per hour per 1000 kW total heat input will be required for inlet and extract air. ◀

**Clause  
7.3.1**

**Delete 1<sup>st</sup> line under Example calculation for fanned ventilation.  
Substitute:**

- Boiler capacity = 800 kW ◀.

**Clause  
7.6.1**

**Delete the clause retaining the Note: Substitute:**

- In a building having an air change rate of less than 0.5 air changes per hour and room volume less than 1500 m<sup>3</sup>, ventilation of 2 cm<sup>2</sup> for every kW net heat input at high and low level, or mechanical ventilation (see clause 7.6.3) shall be applied (see Figure 5). ◀.

**FIGURE 5 Delete the key on the Figure 'No additional ventilation...'. Substitute:**

- Additional natural or mechanical ventilation may not always be necessary. ◀

**Clause  
7.6.2**

**Delete the clause. Substitute:**

- Low level only ventilation at 2 cm<sup>2</sup> kW<sup>-1</sup> is required for any space containing gas appliances and having a natural air change rate exceeding 0.5 air changes per hour (low level ventilation is defined in clause 7.2.1.7). ◀

**Clause  
7.6.3.5**

**Delete the Note. Substitute:**

➤

*Note: For guidance, the added mechanical ventilation would need to be 1.35 m<sup>3</sup> h<sup>-1</sup> kW<sup>-1</sup> (0.375 m<sup>3</sup> s<sup>-1</sup> 1000 kW<sup>-1</sup>) net heat input, to equate with a naturally ventilated space as given in clause 7.6.2. ◀*

**Clause  
8.7.1.1**

**Delete the clause. Substitute:**

- For any termination or group of terminations with a total net heat input exceeding 333 kW net heat input, the general requirements of this Sub-Section shall apply and approval must be sought from the Local Authority prior to commencement of the installation.

Horizontal flue terminations (other than for fan diluted flues, see Sub-Section 8.7.5) are not permitted for any termination or group of terminations with a total net heat input exceeding 135 kW net heat input unless approval by the local Environmental Health Officer (EHO) (see also Appendix 9).

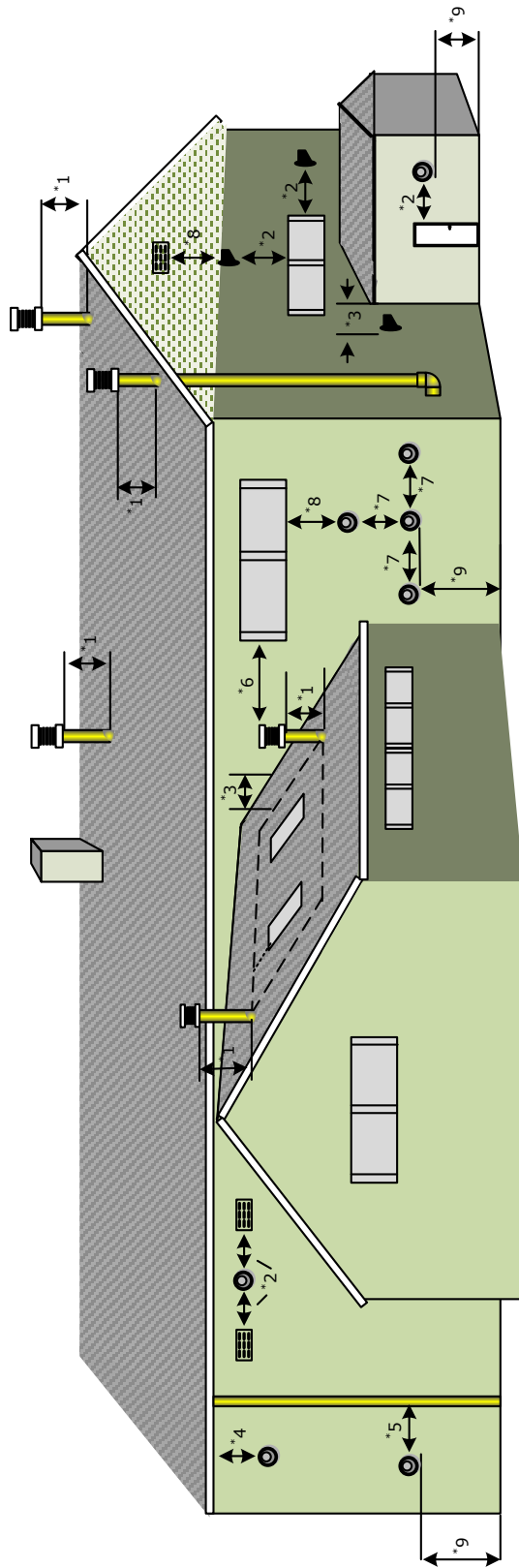
Horizontal flue terminations (other than for fan diluted flues, see Sub-Section 8.7.5) are not permitted for any termination or group of terminations with a total net heat input exceeding 333 kW net heat input. ◀

**Clause  
8.7.1.3**

**Add a Note:**

- *Note: Appendix 9 provides a risk assessment for the position of horizontal flue terminations. It may be applied as appropriate for vertical flues. ◀*

**FIGURE 6 Delete the Figure. Substitute:**

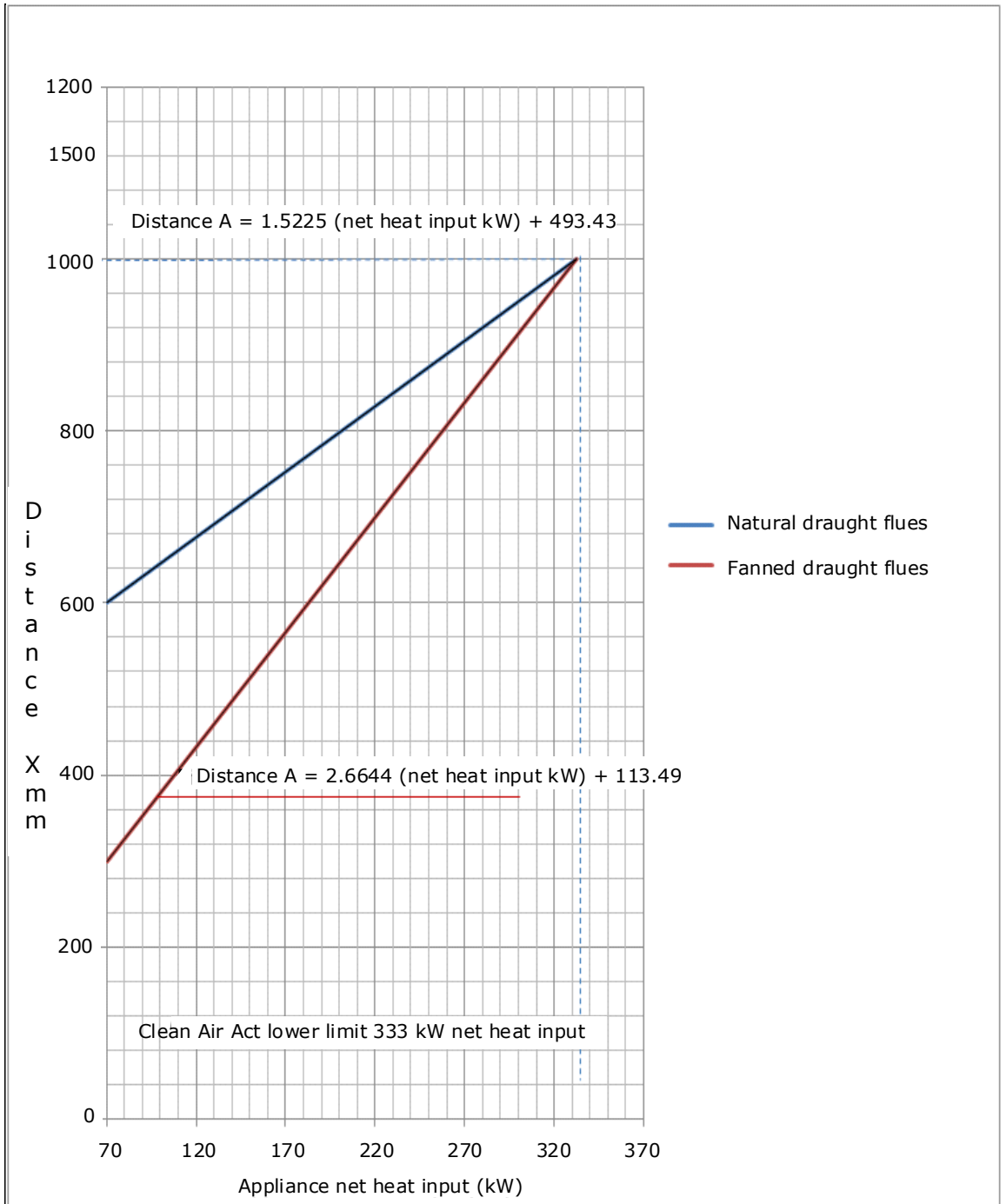


**Key to Diagram:**

- \* 1 - Minimum termination height for ridged and flat roofs, see clause 8.7.2 and Figures 10A and 10B.
- \* 2 - Minimum horizontal termination distance from openings i.e. doorways, windows, ventilation grilles, etc., see clause 8.7.1.3 and Figure 7.
- \* 3 - Minimum horizontal termination distance from adjacent walls or obstructions, see clause 8.7.2.7.
- \* 4 - Minimum distance to be 200 mm for fan assisted appliances, 300 mm for room sealed natural draught appliances, see BS 5440 and clause 8.7.3.3.
- \* 5 - Minimum distance to be 150 mm, see BS 5440 and clause 8.7.3.3.
- \* 6 - Minimum termination distance from openings i.e. doorways, windows, ventilation grilles, etc., see clause 8.7.2.2.
- \* 7 - Minimum distance of centres of flue terminal, see manufacturer's instructions.
- \* 8 - Minimum distance below terminal or opening 2.5 m, see Figure 7.
- \* 9 - See Sub-section 8.7.3.

➤ **FIGURE 6 – EXAMPLE OF TERMINATION POSITIONS ◀**

**FIGURE 8 Delete the Figure. Substitute:**



Note 1: The type of flue does not necessarily reflect the type of connected appliance.

Note 2: The equations on the graph are represented by the appropriate plotted line.

**FIGURE 8 – HEIGHT 'X' OF THE FLUE TERMINAL LOCATED ON A ROOF FOR APPLIANCES UP TO A NET HEAT INPUT OF 333 kW ←.**

**Clause  
8.7.2.3**

**Delete the clause. Substitute:**

➤  
Single or groups of appliances exceeding 333 kW net heat input must terminate above roof level as required by the Clean Air Act. ◀.

**Clause  
8.7.2.4**

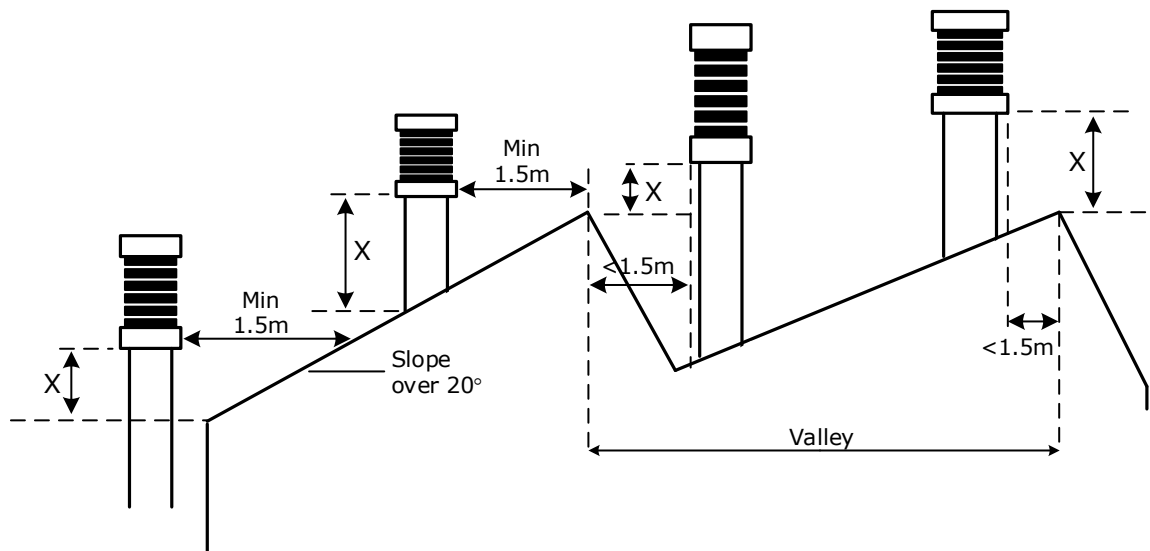
**Delete the clause. Substitute:**

➤  
Where a chimney is used, the chimney height, rounded up to the nearest metre, shall give a termination position at least 3 m above the level of any adjacent area to which there is general access, for example ground level, roof areas or adjacent openable windows. The chimney height shall not be less than the height of any building within a distance of 5 times the uncorrected chimney height (U) for appliances above 70 kW net heat input (see Figure 9) and worked example A4.6.3. ◀.

**FIGURE  
10A**

**Delete the Figure. Substitute:**

➤



*Note 1: For dimension X – see Figure 8.*

*Note 2: A pitched roof has a slope of greater than 20° from the horizontal.*

**FIGURE 10A – TERMINATIONS FOR RIDGED ROOF CONFIGURATIONS ◀**

**Clause  
8.7.3.3**

**Delete the 1<sup>st</sup> paragraph. Substitute:**

➤  
Horizontal terminations shall be located according to the minimum distances given in Figure 7, Figure 12, and subject to the risk assessment criteria given in Appendix 9.

**Clause  
8.7.3.4  
8.7.3.4**

**Add a clause:**

The termination shall be guarded if it is less than 2 m above ground level or in any position where it may cause injury to persons resulting from touching hot surfaces.

**Clause 8.7.3.5** Add 1<sup>st</sup> paragraph and Note to a clause and make 2<sup>nd</sup> paragraph from clause 8.7.3.3 the 2<sup>nd</sup> paragraph of this clause:

8.7.3.5

Any termination of a room sealed appliance shall be in such a position as will not cause a hazard to the health of persons who may be nearby or a nuisance to other persons beyond the curtilage and shall satisfy the Risk assessment in Appendix 9.

*Note: If practical, discharges at 45° to horizontal and above may be used. ◀*

**Clause 8.7.3.6** Add new clause:

8.7.3.6 The terminal shall not be positioned at a height of less than 300 mm from the ground or horizontal surface to avoid being covered by snow or other debris and as high as reasonably practicable. ◀

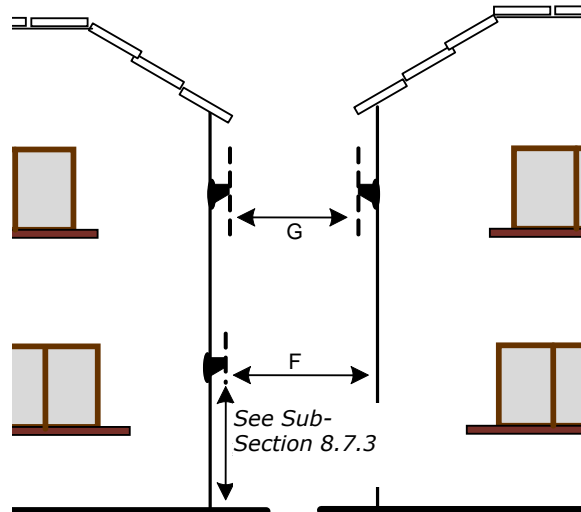
**Clause 8.7.3.4** This clause becomes 8.7.3.7. Substitute:

8.7.3.7

**Clause 8.7.3.5** This clause becomes 8.7.3.8

**FIGURE 11A** Delete the Figure. Substitute:

▶



Horizontal flue distance from opposing wall and other terminals (see Figure 12)

**FIGURE 11A – FLUE TERMINALS ON AN ADJACENT BUILDING ◀**

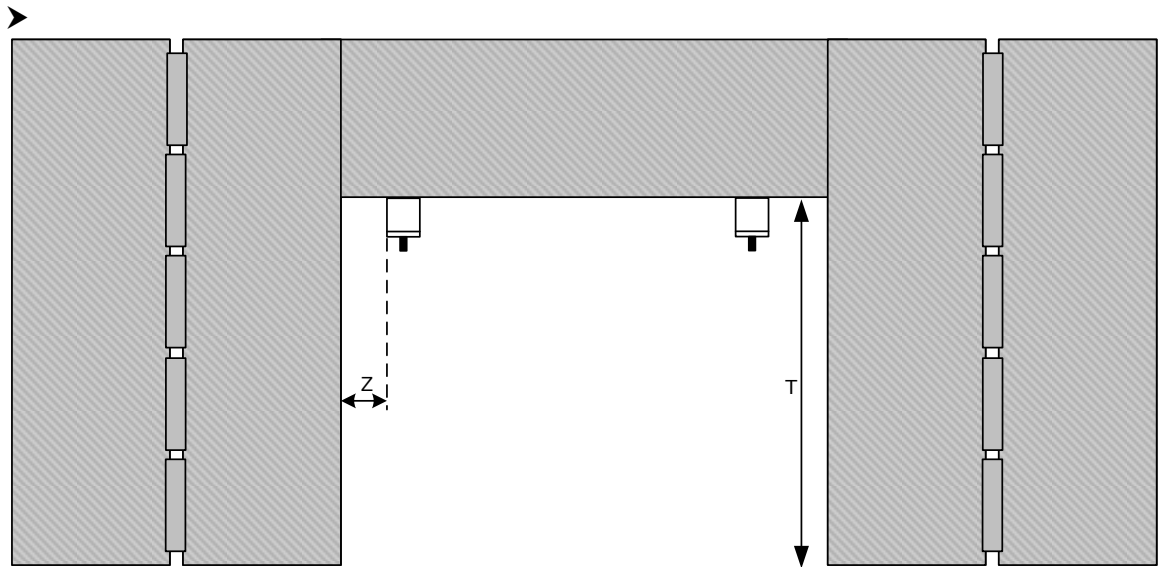
**Clause 8.7.3.7** This clause becomes 8.7.3.9

**Clause 8.7.3.8** Delete 1<sup>st</sup> paragraph. Substitute:

8.7.3.10 Where a horizontal terminal is adjacent to two or more vertical wall surfaces, as shown in Figure 11B the distance from the side of the terminal shall be at least

as given in Figure 12 Line F, based upon the total rating of the appliance or group of appliances. The recess shall not incorporate any roof/cover. ◀

**FIGURE 11B Delete Figure. Substitute:**



**Key:**

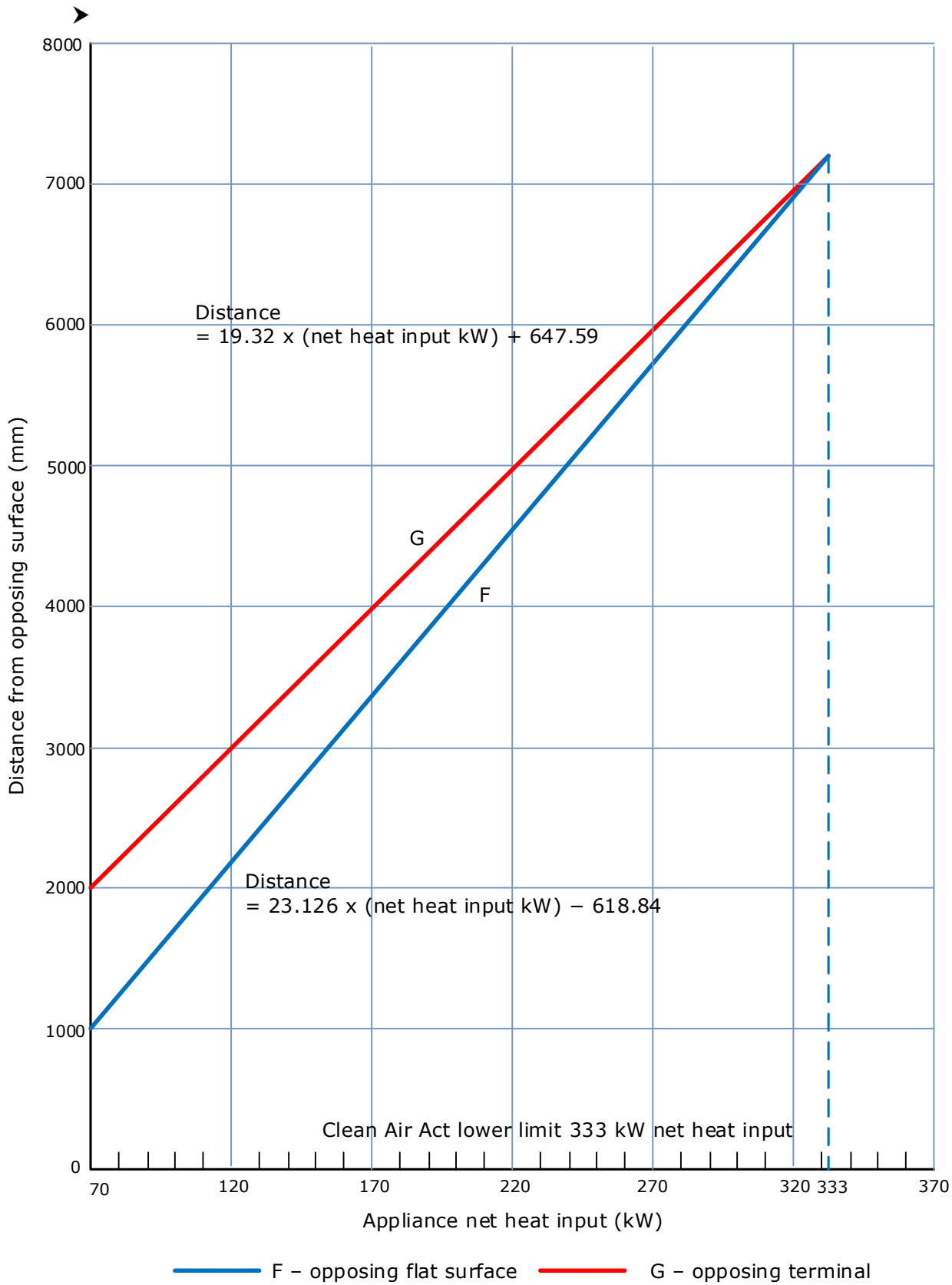
Z See clause 8.7.3.10 and Figure 11A.

T Maximum depth of the building. See clauses 8.7.3.10, 8.7.3.11 and Figure 11A.

**FIGURE 11B – HORIZONTAL FLUE TERMINALS ENCLOSED BY TWO OR MORE VERTICAL WALLS (PLAN VIEW) ◀**



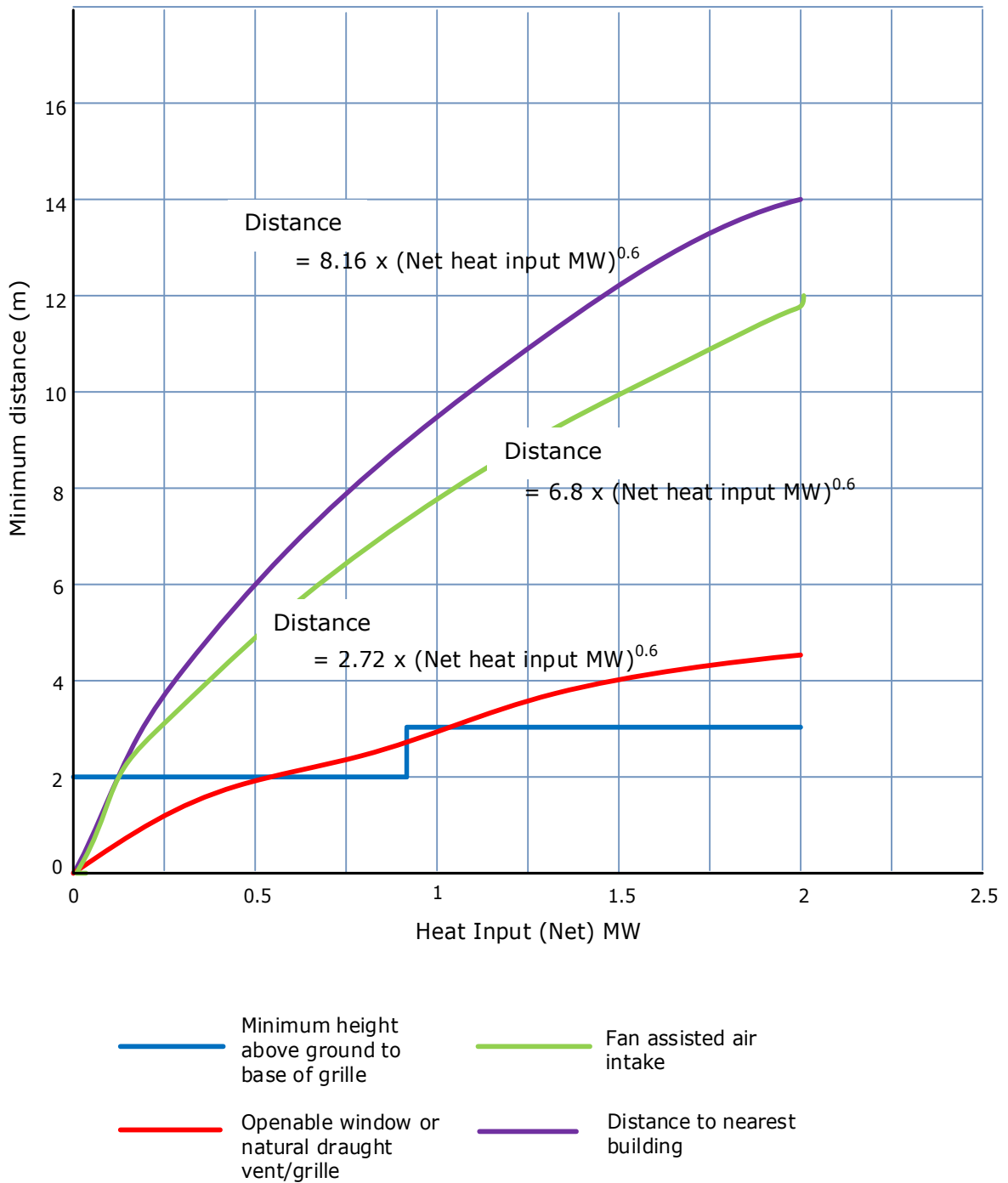
**FIGURE 12 Delete the Figure. Substitute:**



Note: The equations on the graph are represented by the appropriate plotted line.

**FIGURE 12 – MINIMUM SPACING OF ROOM SEALED APPLIANCE FANNED DRAUGHT TERMINALS FROM OPPOSING FLAT SURFACES 'F' AND OTHER TERMINALS 'G' <**

**FIGURE 13 – Delete the Figure. Substitute:**



**Figure 13 – Note – Delete Note. Substitute:**

➤Note 1: The equations on the graph are represented by the appropriate plotted line.

Note 2: The distance needs to be rounded up to the nearest metre. ◀



**Sub-Section Delete the paragraph. Substitute:**

**12.2**



Wherever a bio-mass appliance is installed alongside a gas fired appliance, a risk assessment shall be performed to consider the hazards of dust accumulation in the vicinity of the appliances in compliance with DSEAR. In all cases, where biomass appliance is to be installed in conjunction with other heating/process plant and or as an individual appliance, regardless of output, the Local Authority planning office should be contacted to be made aware of the proposed installation. ◀

**Sub-Section Delete 1<sup>st</sup> and 2<sup>nd</sup> paragraph. Substitute:**

**12.5**



The Clean Air Act 3<sup>rd</sup> Edition of the Chimney Heights Memorandum may not be totally relevant or appropriate for accessing a flue discharge height for submission to the Local Authority for approval. If the discharge contains particulates (PM10, PM2.5) and/or high levels of Nitrous Oxides (NO<sub>x</sub>) then the Memorandum would not be appropriate. Consultation should be held with the Local Authority for all proposed bio-fuel installations at an early stage to obtain guidance (see Appendix 8 for more guidance).

The determination of the discharge height for a gas fired appliance, where installed with bio-fuel fired appliances, should be performed separately using this Standard. If the gas fired boiler discharge is separated by a distance of 5U from the bio-fuel fired boiler discharge then the chimneys can be treated as separate discharges with different discharge heights. However, if the gas fired appliance discharge is within that 5U distance, then both discharges should terminate at the worst case height. ◀

**A2.3 Delete 10<sup>th</sup> bullet. Substitute:**

- ➤◀

**A2.3 Add bullet point:**

- ➤ L153 Managing health and safety in construction. CDM Regulations ACoP and guidance ◀.

**A2.4 Delete 7<sup>th</sup> bullet point and substitute:**

- ➤ IGEM/UP/12 Application of burners and controls to gas fired  
Edition 2 process plant ◀

**A2.5 Add bullet point:**

- ➤ BB101 Building Bulletin 101 Ventilation of school buildings.  
◀

**A3.1 Delete 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> paragraphs and the Note. Substitute:**



Since 1956, the requirements for chimney heights have been enacted within the Clean Air Act (CAA) and supported by the 3<sup>rd</sup> Edition of the Memorandum on Chimney Heights. These requirements concentrated on dust smoke and grit emissions, which today are not relevant to the vast majority of gas and liquid fuel installations for heating and hot water in buildings. For installations burning very low sulphur (VLS) fuels such as NG, LPG and Gas Oil, the official guidance on chimney heights has been through the 3<sup>rd</sup> Edition of the Memorandum on Chimney Heights, but this information was based upon sulphur emissions. In the early years of the drafting of IGE/UP/10 (then BG IM/11) the British Gas research was based upon NO<sub>x</sub> emissions. In reality the end result of the chimney height was little different from a design according to the 3<sup>rd</sup> Edition. However, the guidance contained in IGEM/UP/10 has been based upon the British Gas work and not the 3<sup>rd</sup> Edition and it has been a primary source for the information on chimney heights for NG and LPG installations amongst designers and installers. This 3<sup>rd</sup> edition of CAAM is no longer freely available and is considered by many specialists not to be up-to-date with modern appliance technologies and performance. As such, compliance with this Standard satisfies the requirements of the CAA.

For all gas, bio-mass and solid fuelled plant above 20 MW reference has had to be made to the Technical Guidance Note (Dispersion) D1 (Guidelines on discharge stack heights for polluting emissions) as the advice given in the 3<sup>rd</sup> Edition of the memorandum on chimney heights has not covered such plant. This is a little known but extremely important document, especially for solid fuels and bio-mass installations.

*Note: The document D1 is currently out of print, but may still be available. ◀*

**A3.2 Delete 4<sup>th</sup> paragraph.**

**A3.2 Delete 7<sup>th</sup> paragraph. Substitute:**



Notification for gas systems comes into effect for any system having a heat input totalling more than 333 kW net (approximately 366 kW gross). ◀

**A3.3 Delete the first sentence of the 1<sup>st</sup> paragraph. Substitute:**



The requirements of the Clean Air Act specify a design exit velocity for the flue system operating under: ◀

**A3.3 Delete 2<sup>nd</sup> paragraph. Substitute:**



Modern boilers are able to operate under high turndown ratios from high to low fire and therefore make it impractical to enforce above the design velocities. Attempts to reduce the exit area of the flue to achieve higher exit velocities have been resisted as the practice can make the appliances less reliable and more importantly affect the safety of the appliance. This design limitation has been removed from this edition of IGEM/UP/10. ◀

**A3.7 Delete 3<sup>rd</sup> paragraph. Substitute:**



Equally, a row of small room sealed appliances not exceeding 70 kW each located on a wall with flues say less than 1.5 m (5 times 0.3 m from BS 5440 Part 1) apart would be treated as a group. This would then impact on the height and location of the termination. ◀

**A4.1.3 Delete the Note. Substitute:**

- *Note: VLS fuels include NG, gas oil, premium kerosene, butane, propane and may apply to some bio-gases and bio-liquids. Fuels which have sulphur content above 0.04% by weight see Clean Air Act.* ◀

**A4.1.5 Delete the paragraph. Substitute:**

- This Appendix is concerned only with normal emissions of gaseous pollutants; it does not deal with grit and dust or afford protection against combustion odours or excessive concentrations of CO produced by inefficient combustion. There may be circumstances in which this Appendix will not provide adequate guidance, e.g. where a chimney is to discharge on a roof with complicated structures or in difficult topography or where there are a number of closely adjacent chimneys. In such cases, specialist advice needs to be sought. ◀

**A4.1.6 Delete the paragraph. Substitute:**

- The Appendix is applicable to chimneys of VLS fuel burning appliance with total installed net heat input (that is, heat release rates in the combustion chamber) exceeding 70 kW and up to 333 kW net heat input. It does not deal with direct fired heating systems which discharge into the space being heated. Nor does it apply to incinerators or very large systems, which require separate treatment depending on the pollutants emitted. ◀

**A4.6.3 Delete Example 1. Substitute:**



For chimney B, the uncorrected chimney height U (from Figure 15C) is 7.6 m.

Therefore the final chimney height is  $(H_c) = H_B + 0.6(U) = 10 + 0.6(7.6) = (14.56) 15 \text{ m}$  (round up to the nearest metre). ◀

**Appendix 5 - Guidance: Delete the text and substitute:**



The Secretary of State has in previous years produced the following guidance on the calculation of chimney heights:

- HMIP Technical Guidance Note D1: Guidelines on Discharge Stack Heights for Polluting Emissions. Published by HMSO, ISBN 0-11-752794-7
- 3<sup>rd</sup> Edition of the 1956 Clean Air Act Memorandum on Chimney Heights.

Both guidance notes are now unfortunately out of print, however you can request a copy from the British Library at [www.bl.uk/catalogues/listings.html](http://www.bl.uk/catalogues/listings.html).

Compliance with this standard meets the design requirements for NG, LPG and clean bio-gases. ◀

**Appendix 5 Delete Part 2 E Table centre column. Substitute:**

➤  
Net calorific value (MJ kg<sup>-1</sup> or  
MJ m<sup>-3</sup>) ◀

**A7.2 Delete the value of expression E in the third formula. Substitute:**

➤ E is an excess air percentage value. ◀

**A7.2 Delete the title of the eighth formula. Substitute:**

➤ The total air inlet requirement is: ◀

**A8.2 Delete the 1<sup>st</sup> paragraph. Substitute:**

➤ The determination of the discharge height for a gas fired appliance where installed with a bio-mass fired appliance needs to be performed separately using the Clean Air Act guidance.

If the gas fired appliance discharge is separated by a distance of 5U (CAAM procedure) from the bio-mass fired boiler discharge then the chimneys can be treated as separate discharges with different discharge heights. However, if the gas appliance discharge is within the 5U distance (CAAM procedure) then both discharges are to terminate at the worst case height. ◀

**A8.4 Delete this Sub-Section. Substitute:**

➤ **THE ENVIRONMENT ACT, THE CLEAN AIR ACT AND LAQM**

The Clean Air Act requires the chimney height of a biomass boiler burning more than 45.4 kg h<sup>-1</sup> of biomass fuel (approximately 100 kW) to be approved by the Local Authority. (Below 45.4 kg per hour the relevant Building Regulations apply).

Under the Environment Act 2005, Local Authorities throughout the UK have a statutory duty to review and assess air quality in their council area against the objectives set for nitrogen dioxide, particles measuring 10 µm or less, sulphur dioxide and other gases, they are required to identify any likely incidents of these Air Quality Objectives that may be or are being exceeded.

Technical document LAQM. TG(09) provides guidance on meeting the provisions of the Environment Act.

*Note The examples have been removed because LAQM also places a great emphasis on particulate emissions, which may have a significant effect on the final chimney height. ◀*

**Appendix 9 Delete the entire Appendix. Substitute:**

**> APPENDIX 9 : RISK ASSESSMENT FOR POSITIONING OF HORIZONTAL FLUES TERMINATIONS <**

Further to the requirements in Section 8 under clause 8.7.3.3 and Figure 7 the following risk assessment gives guidance for the positioning of horizontal flues.



<b>Type C appliances with net heat input exceeding 70 kW and not exceeding 333 kW low level flue discharge risk assessment (including net heat input for groups of appliances)</b>			
<b>No.</b>	<b>Regarding the flue position</b>	<b>NO</b>	<b>YES</b>
1	Is the proposed flue termination within the distance in Figure 12 Line G of a road, path, track, thoroughfare, walkway, property boundary or area which is used for general public access other than for maintenance purposes?	N	Y
2	Is the proposed flue termination within the distance in Figure 12 Line G to a playground, school yard, seating area, or area where there may be a public gathering?	N	Y
3	If the proposed flue termination enclosed on more than two sides then does it comply with the requirements of Figure 11B?	N	Y
4	Is the proposed flue termination within the distance in Figure 12 Line G of a surface or building element that may be affected by corrosion or deterioration from plume condensate?	N	Y
5	Is the proposed flue position in an area where vehicles could be parked within distances from Figure 12 Line G to the flue?	N	Y
6	Are there shrubs or trees within minimum distances shown on Figure 12 Line G of the proposed terminal position?	N	Y
7	Is the proposed flue termination within a light well?	N	Y
8	Are the products of combustion from the proposed flue position likely to build up under unfavourable atmospheric conditions, due to poor cross flow of air caused by enclosures or adjacent structures?	N	Y
9	Is the flue termination position likely to cause a nuisance to adjoining properties?	N	Y
<b>Building Regulations part J</b>		<b>NO</b>	<b>YES</b>
10	Is the proposed flue termination is less than 300 mm from the boundary of the property, as measured from the side of the terminal to the boundary?	N	Y
<b>Regarding the Clean Air Act</b>		<b>NO</b>	<b>YES</b>
11	Is the total output of individual, or group of flue terminals (if within 5U (see A3.7)), greater than 333 kW net heat input?	N	Y
<b>General</b>		<b>NO</b>	<b>YES</b>
12	Are there any other considerations that are required for this risk assessment, see separate sheet?	N	Y
13	Comments:		

Following the resulting risk assessment, the flue termination position is considered as:

All answers are blue (N)		Flue position is suitable
Any answer is orange (Y)		Flue position is unsuitable
Company name		
Gas safe registration number		
Engineer code		Engineer name
Job number		Date
Customer first line of address		
Post code		Customer name



**Appendix 11      Add title to Flue smoke test certificate**

➤ **FIGURE 19 – A TYPICAL SMOKE TEST CERTIFICATE** ◀

**Appendix 11      Add title for the Flue leakage test (leakage test sheet)**

➤ **FIGURE 20 – A TYPICAL FLUE LEAKAGE TEST RECORD** ◀

**END OF THESE UP/10 AMENDMENTS**



**IGEM/UP/10 Edition 4  
COMMUNICATION 1774  
2014  
AND COMMUNICATION 1786  
2016**

The following Amendments (February 2017) apply to all copies of IGEM/UP/10 Edition 4 published in 2014 and 2016.

**Contents Add:  
Appendix**

12 Flue/chimney identification plate 115

**Clause Delete Note 4. Substitute:  
2.1**

- *Note 4: The ratio of gross to net heat input is, approximately, 1.11:1, 1.09:1 and 1.08:1 for appliances on Natural Gas (NG)/Town's Gas, propane and butane respectively. For the purposes of this Standard, where gross heat inputs represent requirements of existing standards, they are converted to net using a conversion factor in all cases. For example, 600 kW gross heat input =  $600 \div 1.11 = 545$  kW net heat input for NG. <<*

**Clause Delete the clause. Substitute:  
7.3.1**

- The quantity of air and extract ventilation for plant of total net heat input exceeding 70 kW and not exceeding 1.8 MW shall be as given in Table 2. For net heat inputs exceeding 1.8 MW, the quantity of air and extract ventilation shall at least be as given in Table 2 or the ventilation flow rate for the specific plant shall be calculated using an appropriate method. Where a bio-fuelled appliance is installed in the same space as a gas appliance, the additional mechanical ventilation provisions for that appliance shall be as per that of a gas fired appliance as detailed in Table 2. <<

**Clause Add a note:  
8.1.4**

- *Note: Additional requirements for flue systems in teaching establishments are specified in IGEM/UP/11 under Ventilation and Flues. <<*

**Clause Add new clause.  
8.1.9**

- It is a requirement of BS EN 1856 that all flue installations are fitted with a data plate (see Appendix 12). <<

**Clause Delete the clause. Substitute:  
8.2.1.1**

- All chimney and flue components shall be fit for purpose and suitable for the application. Typical materials are listed in Table 3. <<

**Clause Add Note 3:  
8.2.1.1**

- *Note 3: These materials may not be suitable for every system. For example:*
- *stainless steel materials are the preferred material for many applications.*
  - *depending upon maximum combustion gas temperatures and application suitability, plastic materials and coatings may be appropriate. <<*

**Table 3 Delete the Table. Substitute:**

➤➤

<b>STAINLESS STEEL MATERIALS</b>	<b>ALUMINIUM MATERIALS</b>	<b>PLASTIC MATERIALS</b>
BS EN ISO 9445-1 and -2 material grades 304S31 316S31	As specified in BS EN 1856-1 and BS EN 1856-2	As specified in BS EN ISO 13968 BS EN 14471

◀◀

**Clause 8.6.7 Delete the clause. Substitute:**

➤➤ Where the appliance combustion gases may cause condensation within the flue system during use, the flue system including fan diluted flues, fans and attenuators shall be constructed of materials resistant to corrosion and that have an acceptable life expectancy.

*Note 1: Further information on materials is given in clause 8.2.1.*

*Note 2: Some flue systems may require lining or separate flues for condensing applications.*

*Note 3: Where an attenuator is used, it may be of galvanised steel on the inlet side of any chimney connection. Galvanised ducting is not normally recommended for fan diluted flue applications due to its short life expectancy. ◀◀*

**Clause 8.7.1.1 Delete the clause. Substitute:**

➤➤ For any termination or group of terminations with a total net heat input exceeding 333 kW, the general requirements of this Sub-Section shall apply and approval must be sought from the Local Authority prior to commencement of the installation.

Horizontal flue terminations (other than for fan diluted flues, see Sub-Section 8.7.5) are not permitted for any termination or group of terminations with a total net heat input exceeding 333 kW net heat input.

For Horizontal flue terminations not exceeding 333 kW net heat input (other than for fan diluted flues, see Sub-Section 8.7.5) the general requirements of this Sub-Section shall apply (see clause 8.7.3.3). However, for any termination or group of terminations the risk assessment (see Appendix 9) shall be completed to ensure compliance and maybe subject to approval by the local Environmental Health Officer (EHO).

Due regard shall be given to the type of flue design for which the appliance is certified and detailed in the manufacturer's instructions. ◀◀

**Clause 8.7.1.5 Add Note:**

➤➤ *Note: Horizontal flue terminations from room sealed appliances are not treated as an opening to a building. For minimum spacing distances between horizontal flue terminations, refer to manufacturer's instructions or clause 8.7.3.7. ◀◀*

**Clause 8.7.3.7 Delete clause. Substitute**

➤➤ The minimum horizontal spacing between room sealed flue terminals and nearby air inlets shall be distance 'W' for natural draught and distance 'Y' for fanned draught flues as shown in Figure 7 unless otherwise specified by the manufacturer. ◀◀

**Clause 8.7.3.10 Delete first paragraph. Substitute**

- Where a horizontal terminal is adjacent to two or more vertical wall surfaces, as shown in Figure 11B the distance from the side of the terminal shall be at least as given in Figure 7 Line Y, based upon the total rating of the appliance. The recess shall not incorporate any roof/cover. ◀◀

**Clause 8.7.4.11 Add new clause:**

- Any mechanically assisted flue including the fan shall be constructed of a material suitable for the application (see clause 8.2.1.1). ◀◀

**Clause 8.7.5.2 Add Note to the clause**

- *Note 3: A suitable combustion analyser is to be used to measure all combustion product constituents detailed* ◀◀

**Clause 8.7.5.10 Delete first paragraph. Substitute:**

- Any fan diluted flue system, including the fan and its balancing damper shall be constructed of a material suitable for the application (see clause 8.2.1.1). ◀◀

**Clause 8.8.5 Delete note to the clause. Substitute:**

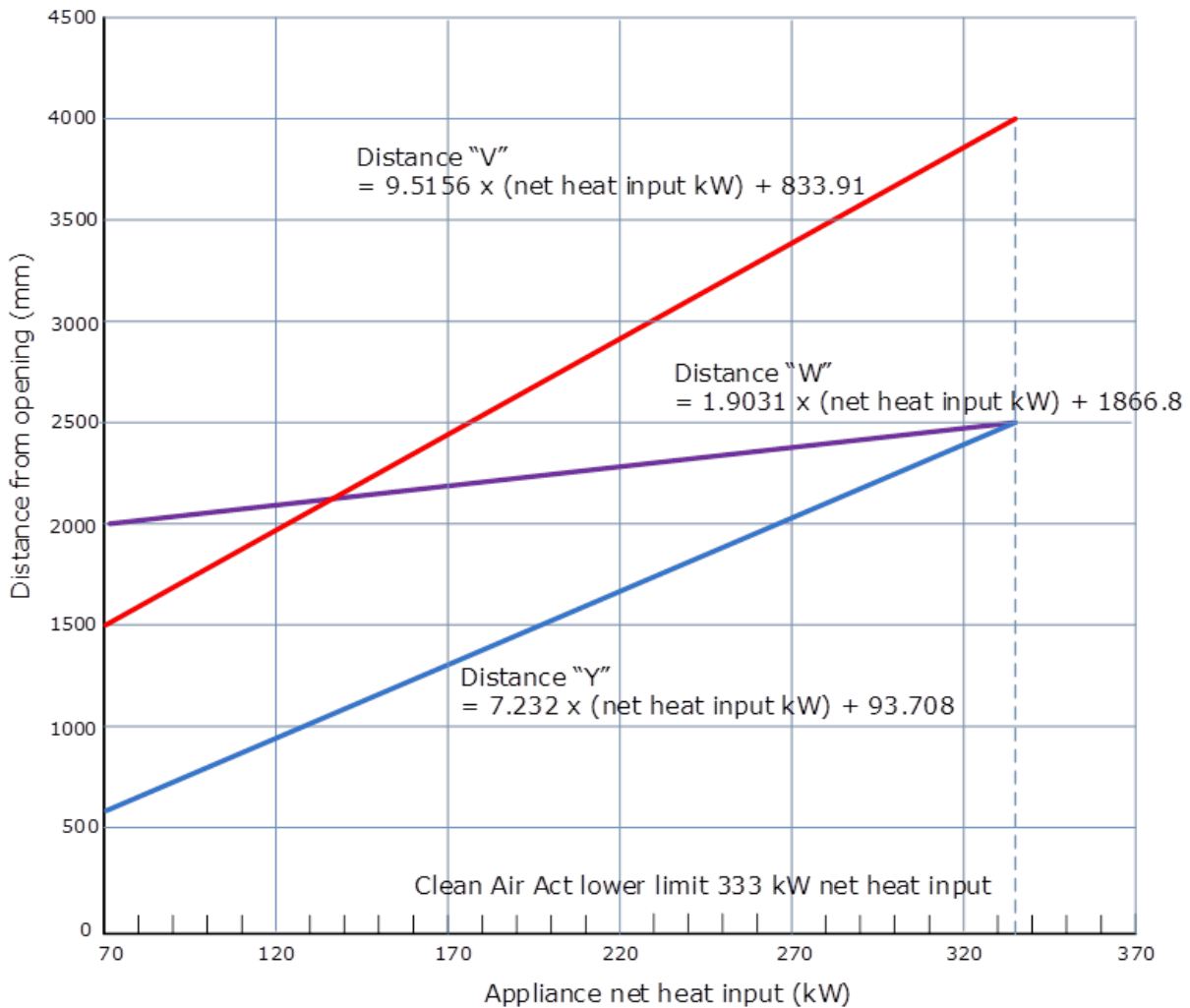
- *Note 2: Flue systems are to be designed to perform within the capacity of the boiler flue fans. Due to the high turndown ratio of these appliances, six appliances to a common flue ought to be the limit. Where multiple boilers on common flues are serving both heating and hot water, due to the vastly different operational characteristics, it is recommended the water supply appliances have a dedicated separate flue system (see A4.8.1.5).* ◀◀

**Clause 8.12.2 Delete the clause and the note. Substitute:**

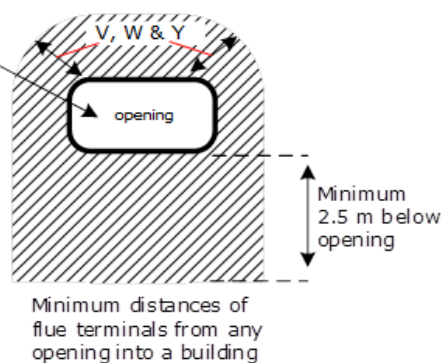
- If there are design exceptions a suitable durable SDVN label/sign shall be displayed in the plant room indicating that the design complies with IGEM/UP/10 except as indicated on the label/sign. In addition, also reference if an 'Environmental Waiver' has been permitted by the Local Authority.

*Note: A typical design of SDVN label is shown in Appendix 6.* ◀◀

**FIGURE 7 Delete the Figure and substitute:**



Openings (air bricks, windows, doorways, ventilation grilles etc.)



**KEY:**

- V is for fan draught and open flued appliances
- W is for balanced or room sealed appliances – natural draught
- Y is for room sealed appliances – fanned draught

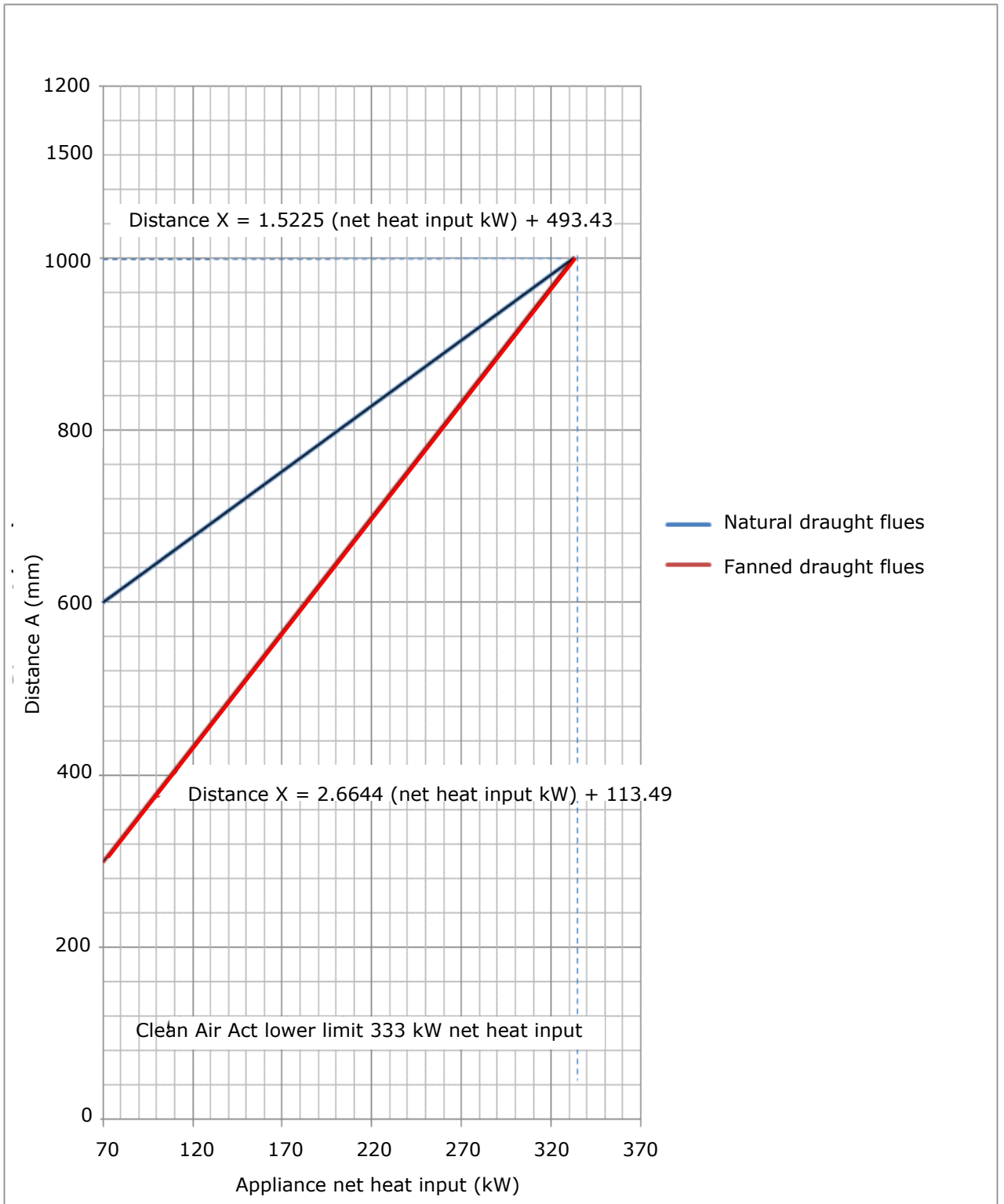
*Note 1: All vertical flues will terminate above roof level and not be nearer any opening than distance V for open flued, V/Y for fanned draught or W for natural draught appliances.*

*Note 2: The equations on the graph are represented by the appropriate plotted line.*

*Note 3: For terminal locations below the opening, V; W and Y are not diagonal dimensions but a horizontal or vertical distance from the terminal. The prohibited area below an opening is the width of V; W or Y and 2.5 m vertically.*

**FIGURE 7 – THE MINIMUM DISTANCE OF FLUE TERMINAL(S) FROM ANY OPENING INTO A BUILDING <<**

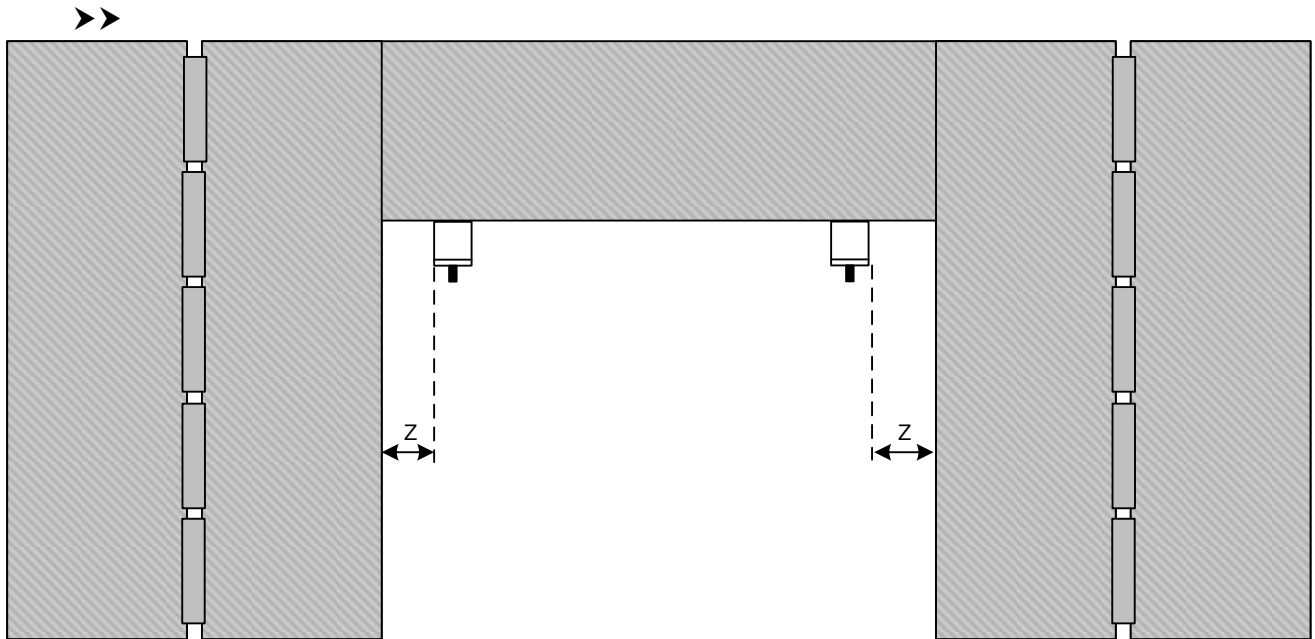
**Figure 8 Delete the Figure. Substitute:**



**Figure 9 Delete formula on the graph. Substitute:**

➤➤  $U = 1.4356 [Q]^{0.6}$   
Where Q = Net heat input (MW) ◀◀

**Figure 11B Delete the Figure. Substitute:**



**Key:**

Z is equal to line Y on Figure 7, see clause 8.7.3.10.

*Note: The length of the vertical walls must not allow products of combustion to build up and/or be likely to cause a nuisance under unfavourable atmospheric conditions, due to poor cross flow of air. ◀◀*

**Appendix A2.4 Add bullet point**

- 
- IGEM/UP/11 Gas installations in educational establishments ◀◀

**Appendix A4.6.2 Delete the clause. Substitute:**

- Where VLS fuels are used the uncorrected chimney height U is determined from the net heat input, which is obtained from the equation:

$$Q = (W \times B) / (3600 \times 1.11) \quad \text{Equation 1}$$

Where:

Q is the net heat input MW

W is the maximum rate of combustion of fuel kg h<sup>-1</sup> for mass or m<sup>3</sup> h<sup>-1</sup> for volume

B is the respective net calorific value MJ kg<sup>-1</sup> or MJ m<sup>3</sup> (if needed these can be converted using the density of NG at 0.74 kg m<sup>-3</sup> or of LPG at 1.85 kg m<sup>-3</sup>).

The uncorrected chimney height (U) can then be derived from the net heat input (Q) using the appropriate equation below:

For heat inputs from 30 MW to 150 MW

$$U = 1.4356 [Q]^{0.6} (1 - (6 \times 10^{-5} [Q]^{1.69})) \quad \text{Equation 2}$$

For heat inputs less than 30 MW, the equation may be simplified by omitting the part in brackets.

$$U = 1.4356 [Q]^{0.6}$$

*Equation 3*

Alternatively Figure 15A, 15B and 15C can be used to obtain the values for U as related to the heat inputs Q. <<

**Figure 15A Delete the formula on the graph. Substitute:**

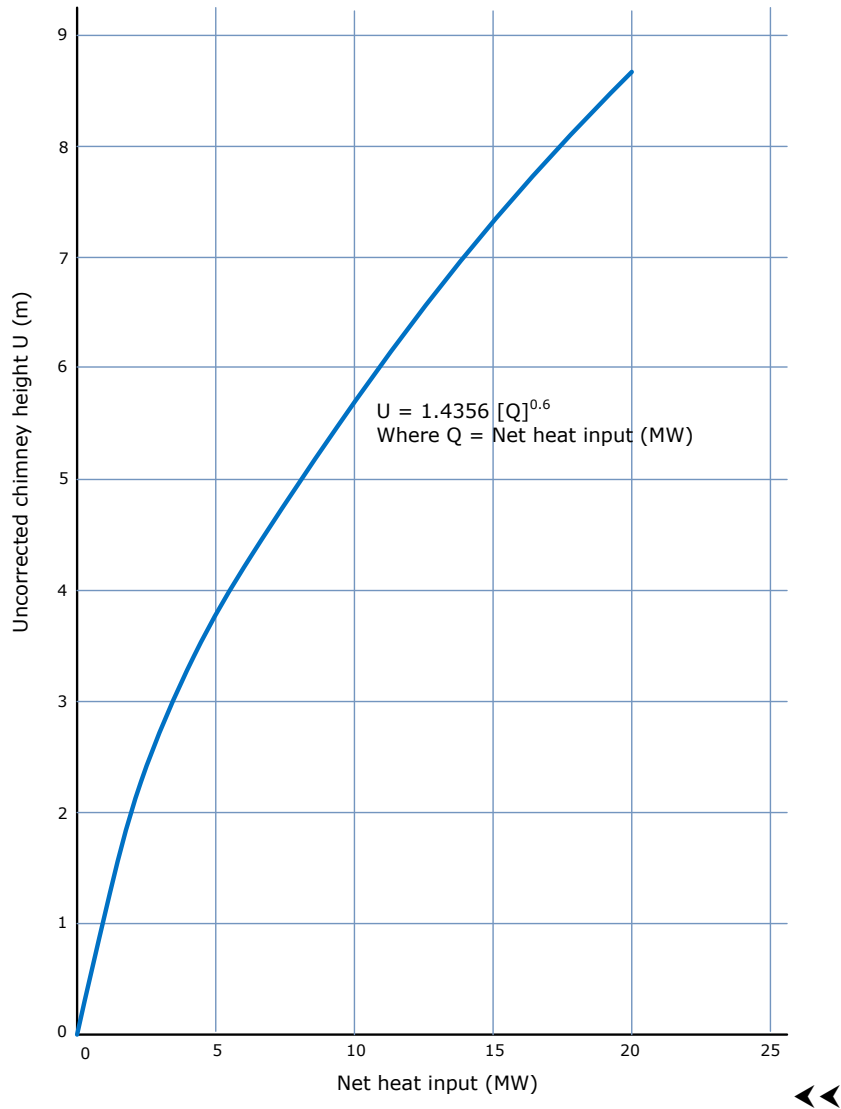
➤➤  $U = 1.4356 [Q]^{0.6} (1 - (6 \times 10^{-5}[Q]^{1.69}))$   
Where Q = Net heat input (MW) <<

**Figure 15B Delete the formula on the graph. Substitute:**

➤➤  $U = 1.4356 [Q]^{0.6}$   
Where Q = Net heat input (MW) <<

**Figure 15C Delete the Figure. Substitute:**

➤➤



◀◀

**Appendix A4.6.3 Delete the two bullet points. Substitute:**

**Example 1**

- ➤➤500 kW net – Example A
- 15 MW net – Example B. ◀◀

**Appendix A4.6.5 Delete third paragraph. Substitute:**

- A definite chimney is not required for fan diluted emissions from appliance systems rated at less than 5.45 MW net (6 MW gross) heat input where the effluent is emitted through the roof and the conditions in a-c) above are met. However, if there is general access to the roof, the termination is to be 3 m minimum height above the roof. ◀◀



**Appendix A10.1.1 Add bullet**

- >> 304 or 316 stainless steel <<

**Appendix A10.2.1 Delete clause. Substitute:**

- >> Consideration to be given to where condensate is to be discharged including:
  - preference is to a foul sewer drainage system
  - is not to be disposed to a 'greywater' recovery system
  - the pipe is to be a minimum of 22 mm diameter
  - if there is a risk of the condensate freezing, the pipe to be a minimum of 32 mm diameter
  - exposed condensate drainage pipe is to be protected with waterproof pipe insulation
  - fitting any condensate trap adjacent to the appliance. <<

Appendix 6 Delete the title and the form. Substitute:

**>> APPENDIX 6 : SYSTEM DESIGN VERIFICATION AND ENVIRONMENTAL WAIVER NOTICE**

<p><b>SYSTEM DESIGN VERIFICATION AND ENVIRONMENTAL WAIVER NOTICE</b></p> <p><i>Design Company:</i> .....</p> <p><i>Installation Company:</i> .....</p> <p><i>Gas Safe Registration No:</i> .....</p> <p><i>Date:</i> .....</p>	<p>This flue system has been designed and installed in accordance with Institution of Gas Engineers &amp; Managers Standard IGEM/UP/10 Installation of flued gas appliances in industrial and commercial premises with the following exceptions:</p>
<p>Site Reference Number:</p>	
<p>Contract Number:</p>	
<p>Customer:</p>	
<p>Consultant:</p>	
<p>Environmental Waiver reference, if applicable:</p>	

◀◀

**Appendix 9 Delete the first sentence and the table. Substitute:**

➤➤ Further to the requirements in Section 8 under clause 8.7.3.3 and Figure 7 the following risk assessment gives guidance for the positioning of horizontal flues. This form should be completed before work commences and undertaken by a person who is competent to undertake the risk assessment.

<b>Type C appliances with net heat input exceeding 70 kW and not exceeding 333 kW low level flue discharge risk assessment (including net heat input for groups of appliances)</b>			
<b>No.</b>	<b>Regarding the flue position</b>	<b>NO</b>	<b>YES</b>
1	Is the proposed flue termination within the distance in Figure 12 Line G of a road, path, track, thoroughfare, walkway, property boundary or area which is used for general public access other than for maintenance purposes?	N	Y
2	Is the proposed flue termination within the distance in Figure 12 Line G to a playground, school yard, seating area, or area where there may be a public gathering?	N	Y
3	If the proposed flue termination enclosed on more than two sides then does it comply with the requirements of Figure 11B?	N	Y
4	Is the proposed flue termination within the distance in Figure 12 Line G of a surface or building element that may be affected by corrosion or deterioration from plume condensate?	N	Y
5	Is the proposed flue position in an area where vehicles could be parked within distances from Figure 12 Line G to the flue?	N	Y
6	Are there shrubs or trees within minimum distances shown on Figure 12 Line G of the proposed terminal position?	N	Y
7	Is the proposed flue termination within a light well?	N	Y
8	Are the products of combustion from the proposed flue position likely to build up under unfavourable atmospheric conditions, due to poor cross flow of air caused by enclosures or adjacent structures and/or likely to cause a nuisance?	N	Y
9	Is the flue termination position likely to cause a nuisance to adjoining properties?	N	Y
<b>Building Regulations part J</b>		<b>NO</b>	<b>YES</b>
10	Is the proposed flue termination less than 300 mm from the boundary of the property, as measured from the side of the terminal to the boundary?	N	Y
<b>Regarding the Clean Air Act</b>		<b>NO</b>	<b>YES</b>
11	Is the total output of individual, or group of flue terminals (if within 5U (see A3.7)), greater than 333 kW net heat input?	N	Y
<b>General</b>		<b>NO</b>	<b>YES</b>
12	Are there any other considerations that are required for this risk assessment, see separate sheet.	N	Y
13	Comments:		

Following the resulting risk assessment, the flue termination position is considered as:

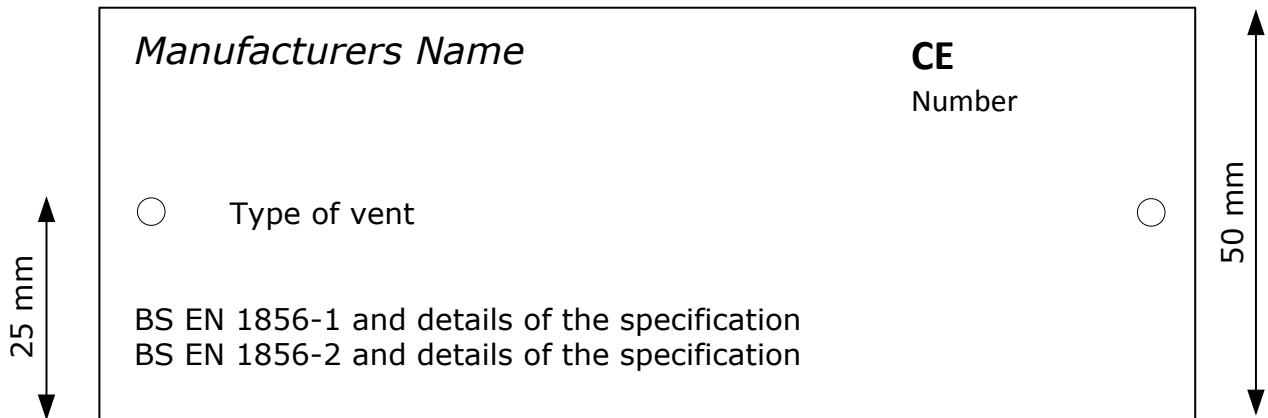
All answers are blue (N)		Flue position is suitable
Any answer is orange (Y)		Flue position is unsuitable
Company name		
Gas safe registration number		
Engineer code		Engineer name
Job number		Date
Customer first line of address		
Post code		Customer name



**Appendix Add:  
12**

**>> APPENDIX 12 : FLUE/CHIMNEY IDENTIFICATION PLATES**

In accordance with BS EN 1856-1 chimney identification plates retaining information related to the product specification and are to be permanently secured to a chimney system and/or in close proximity to it in an un-obstructive but visible location. Suitable fixing positions would be either to/or near any clean outdoors, draught stabilisers, manual dampers or boiler connection components. The plate is not to be removed or defaced and in the event the manufacturer/supplier is to be informed so that the appropriate information can be restored to the chimney system.



**AN EXAMPLE OF A FLUE/CHIMNEY IDENTIFICATION PLATE <<**

**END OF AMENDMENTS TO IGEM/UP/10 Edition 4.**