

# High Rise Inventory 2020

## Summary Report

March 2020

## HIGH RISE INVENTORY 2020: SUMMARY REPORT

### Background

1. The Ministerial Working Group on Building and Fire Safety was established in 2017 to oversee a review of building and fire safety regulatory frameworks, and any other relevant matters, to help ensure that people are safe in Scotland's buildings, and make any recommendations for improvement as required. As part of the Group's work plan, the development of a central source of information on key aspects of the construction and fire safety features of high rise domestic blocks was agreed.<sup>1</sup>
2. The High Rise Inventory (HRI) provides information on the construction and fire safety of high rise domestic buildings. A high rise domestic building is defined in building regulations as a domestic building with any storey at a height of more than 18 metres above the ground, and the HRI therefore includes data for both larger tenemental style buildings as well as those that might be more commonly understood as traditional high rise flatted accommodation. The HRI data collection has been delivered through the Scottish Government's ScotXed Unit, and continues initial data collection commissioned from Capita in 2018. It has been completed by Local Authority Building Standards departments for all relevant buildings, with data provided or verified to the best of the respondents' knowledge at the time of completing the inventory, and should be treated as a snapshot in time.
3. This summary report is based on information held in the HRI in February 2020. The HRI exercise is to be an annual undertaking, following an iterative process of improvement. While there is a small amount of missing data (see paragraph 6), it is intended that this will be addressed in future exercises. Some information however may simply not be available due to e.g. redaction of building warrant information from paper files of a significant age.
4. The HRI data collection is a significant undertaking. Local Authority Building Standards efforts in compiling the collection, and the efforts of Registered Social Landlords (RSLs) in the original 2018 exercise and any relevant subsequent validation, are acknowledged. It can be expected that following this collection, future HRI exercises will be less intensive, requiring for the majority of buildings a more straightforward validation of the data sourced for this initial exercise.

### Completion rates

5. The HRI contained a maximum of 27 questions (Annex A). Most of these questions were adapted from the 2018 exercise, allowing for pre-population and respondents' subsequent verification and update as required. Guidance was also issued with the questionnaire to further aid entering responses.

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<sup>1</sup> For more information on the Ministerial Working Group, see: <https://www.gov.scot/groups/ministerial-working-group-building-and-fire-safety/>

6. Completion rates for each question are also included at Annex A. Questions which dropped below a 90% completion rate included:<sup>2</sup>
  - Question 2.2. – What is the estimated lifespan of the building (79% complete)
  - Question 3.1.1 – If this is a Large Panel System type building, does it have a mains gas supply? (87% complete)
  - Question 3.5.1 – If yes, please identify type (of insulation materials exposed in the external wall cavity). (88% complete)

### **Data Returned: Key Findings<sup>3</sup>**

7. A total of 774 high rise building records were submitted to the HRI, with locations across 15 Local Authorities. 48% of these, representing 372 buildings, are in Glasgow. A map showing the number of reported domestic high rise buildings is provided in Annex B. Where building information was provided, Registered Social Landlords are the most common building owners (36%, 275 buildings).
8. The most common completion date for domestic high rise buildings in Scotland is the 1960s (46%, 354 buildings), with the oldest two buildings reported as being completed pre-1950s.
9. Reported building heights range from 18m to 71.5m, with a median height of 31.5m. The tallest reported buildings are located in Glasgow.
10. There are a reported 46,530 flats in high rise buildings in Scotland.
11. The most common construction type reported for high rise buildings in Scotland is concrete frame (60%, 457 buildings), with the majority of buildings a single construction type (57%, 438 buildings).
12. Aluminium Composite Material (ACM) panels are identified in a small number of buildings (7%, 51 buildings) where information was provided. Of these, 23 buildings reported polyethylene type ACM panels (ACM-PE), a combustible material. Thirteen buildings reported an alternative type of ACM, of which six buildings reported limited area spandrel panels with unknown fire classification and three buildings with panels in lift lobbies and stairwells.
13. Sprinklers or other forms of automatic fire suppression equipment are reported in 300 buildings (39%, where information provided). Fire doors are fitted to all flat doors for 87% (670) of buildings. Fire doors are fitted to all escape stairs for 92% (711) of buildings.

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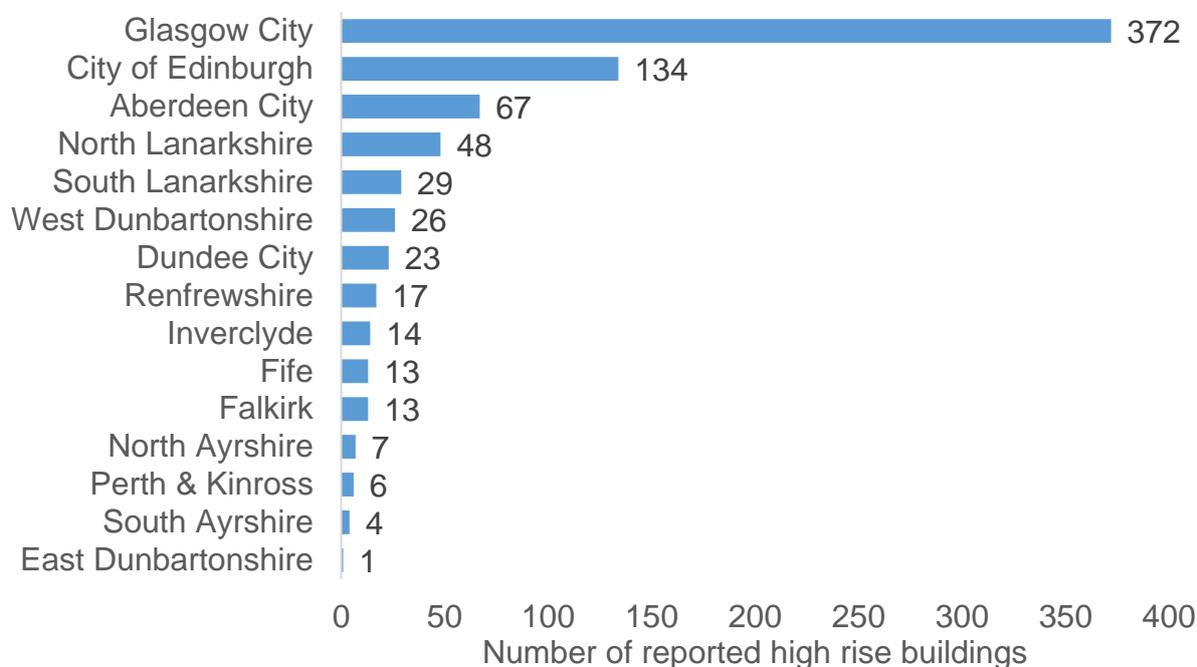
<sup>2</sup> These completion rates exclude buildings for which the question does not apply, but include buildings which may need responses should earlier missing questions be completed. For example, if the building's construction type is not identified, then the mains gas question, which relates only to Large Panel System buildings, may need a response, and is therefore included as a missing response. The completion rates may therefore be viewed as a "worst-case" scenario.

<sup>3</sup> Percentages in this section, unless otherwise stated, are a proportion of completed answers and not the full inventory dataset.

### Data Returns: General Information

14. A total of 774 high rise building records were submitted to the HRI, with locations across 15 Local Authorities. 48% of these, representing 372 buildings, are in Glasgow (Figure 1).

**Figure 1: Reported Domestic High Rise Buildings by Local Authority, HRI 2020.**



15. Registered Social Landlords (RSLs) are the most common building owners, where information was provided (36%, 275 buildings), followed by Local Authorities (33%, 255 buildings) and private owners (32%, 244 buildings).<sup>4</sup>

16. The majority of all RSL and privately owned high rises are in Glasgow (84% and 58% respectively). 34% of privately owned high rises are in Edinburgh. Over half of the 255 LA owned high rises are in Aberdeen City (59 buildings), North Lanarkshire (48 buildings) and City of Edinburgh (42 buildings) (see Table 1).

<sup>4</sup> Private ownership covers those buildings not owned by LAs or RSLs. These may include buildings with flats solely in owner occupation, or of mixed tenure with socially rented tenants (LA and RSL), privately rented tenants and owner occupiers.

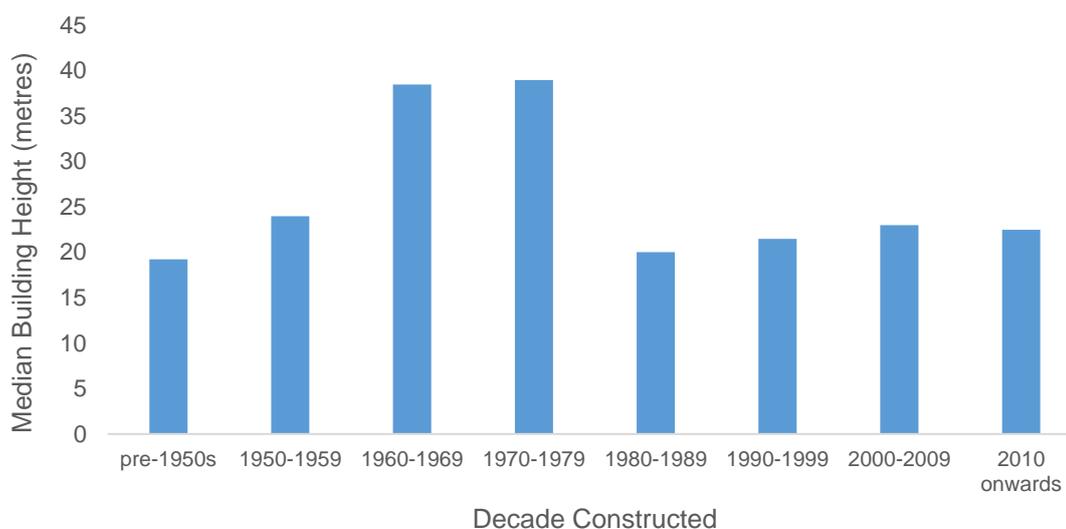
**Table 1: Reported High Rises in each Local Authority Area by Building Owner**

Building Location	Building Owner			Total
	Local Authority	RSL	Private	
Aberdeen City	59	0	8	67
Dundee City	11	6	6	23
East Dunbartonshire	0	0	1	1
City of Edinburgh	42	9	83	134
Falkirk	13	0	0	13
Fife	12	0	1	13
Glasgow City	0	231	141	372
Inverclyde	0	13	1	14
North Ayrshire	7	0	0	7
North Lanarkshire	48	0	0	48
Perth & Kinross	6	0	0	6
Renfrewshire	14	3	0	17
South Ayrshire	3	0	1	4
South Lanarkshire	21	6	2	29
West Dunbartonshire	19	7	0	26
<b>Total</b>	<b>255</b>	<b>275</b>	<b>244</b>	<b>774</b>

**Data Returns: Building Information**

17. Data returns submitted to the HRI indicate that the most common completion date for domestic high rise buildings in Scotland is the 1960s (46%, 354 buildings), followed by the 2000s and 1970s. The oldest two buildings were completed before the 1950s. The estimated remaining lifespan of high rise buildings ranges from 5 years to 100 years. The most commonly reported remaining lifespan was 30 years, although a low question completion rate (79%) means that the true lifespan distribution may be different to that collected. Information on the projected lifespan of a building is not included in Building Warrants or Building Standards certification, and feedback received through the HRI data collection indicated that this was subjective and sometimes challenging data to provide, involving economic as well as structural considerations. Amendment of this question shall be included in considerations for future HRI data collections.
18. Reported building heights range from 18m to 71.5m, with a median height of 31.5m. The tallest reported high rises are in Glasgow. On average, Renfrewshire has the tallest high rise building estate, with a median of 45m across its 17 high rises. The tallest buildings were constructed in the 1960s and 1970s, with a median height of 38.5m and 39m respectively (see Figure 2). The reported number of storeys ranges from 5 to 26, with a median of 12.
19. There are a reported 46,530 flats in high rise buildings in Scotland.

**Figure 2: Median Building Height by Decade Constructed**



### Data Returns: Construction

20. Data returns submitted to the HRI indicate that concrete frame (reported in 457 buildings, 60% of all records) is the most common construction type.<sup>5</sup> A range of other construction types were identified as follows, with more than one construction type per building possible: Large Panel System (LPS) – concrete (26%, 197 buildings); steel frame (21%, 163 buildings); LPS – cassette (4%, 28 buildings); and LPS – structural insulated panels (1%, 11 buildings). An alternative construction type, highlighted through free text response, was reported in 294 buildings, 38% of returns. However, these may overlap with the other categories listed. Where a multiple construction type was identified, 269 buildings had two construction types (35% of all buildings); and 58 buildings had three construction types (7% of all buildings).

21. Of those buildings reporting an LPS-type construction, 59 have a mains gas supply. 22 LPS-type buildings are missing mains gas information.<sup>6</sup>

22. Rendered External Wall Insulation (EWI) is reported on 426 buildings (55% of all buildings).<sup>7</sup>

23. Returns submitted to the HRI indicate that Aluminium Composite Material (ACM) panels are present in a small number of buildings (7% where ACM questions answered, 51 buildings). Of these, 23 buildings reported polyethylene type ACM panels (ACM-PE), a combustible material. A further 15

<sup>5</sup> Large panel system building (LPS), involves casting large concrete prefabricated sections off-site and bolting them together to construct the building.

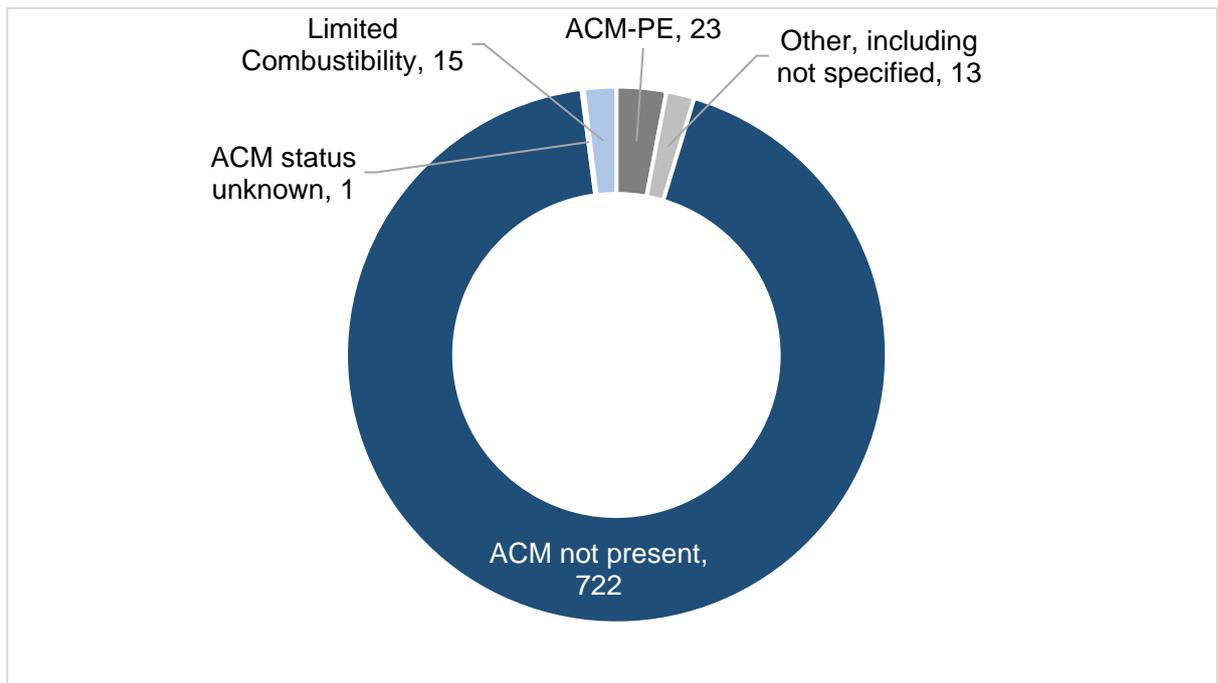
<sup>6</sup> LPS is the type of construction used in Ronan Point, a dwelling block in London which, following an internal gas explosion in 1968, suffered significant collapse of a section of the building. Since then these types of buildings should have been structurally strengthened to avoid any further incidents, but investigations in England post Grenfell have shown that this work has not always taken place. As a result the [Department of Communities and Government wrote](#) to all Local Authorities and Housing Associations in the UK to highlight this and outline actions they may want to consider.

<sup>7</sup> External wall insulation (EWI) is the application of thermal insulation to the external walls of buildings - generally referring to the application of thermal insulation material and a finish system to the outside face of the external walls of an existing building to improve its thermal performance.

buildings reported limited combustibility ACM and 13 had other or non-specified ACM panel types (Figure 3). Local Authority Building Standards departments have subsequently indicated that the process of replacement of ACM-PE on buildings where it has been reported is planned or underway.

- 24. An alternative type of ACM was reported in 13 buildings, of which six buildings reported limited area spandrel panels with unknown fire classification and three buildings with panels in lift lobby and stairwell. (Figure 3).

**Figure 3: Number of reported high-rise buildings with ACM panels and type where present**



- 25. Other types of external wall panels are reported in 489 buildings (63% of all buildings). Where the type of external wall panels is identified, types include: masonry infill (33%, 160 buildings); rainscreen insulation board (13%, 63 buildings); zinc (10%, 49 buildings); high pressure laminate (8%, 40 buildings); terracotta tiles (8%, 37 buildings); stone (6%, 30 buildings); solid metal panels (6%, 30 buildings); other metal composite (4%, 18 buildings); granite (3%, 14 buildings); slate (1%, seven buildings); and concrete panels (<1%, two buildings). In 68% of buildings where external wall panels were reported, other types of external wall panel are identified using free text responses.

- 26. In total, 231 buildings are reported with insulation materials exposed in the external wall cavity (30% of all buildings). Where the type of exposed insulation is identified, stone wool is the most commonly reported (78 buildings), representing 34% of buildings where exposed insulation is reported, and 10% of all buildings overall. However, 57% of buildings where exposed insulation is reported returned free text responses, which may overlap with other categories.

Phenolic foam is reported for 29 buildings, polyisocyanurate in five buildings and four buildings are reported with exposed expanded polystyrene insulation..

### **Data Returns: Fire Safety**

27. Data returns submitted to the HRI indicate 83% of buildings have one escape stair and 17% have two escape stairs or more.
28. Fire doors are fitted to all flat entrances in 670 building (87% of all buildings) and a partial number of flat entrances in 48 buildings (6% of all buildings). Of the 36 buildings (5% of all buildings) where fire doors are not fitted to flat entrances further details are provided for 34 buildings. There were some instances where fire doors fitted to flat entrances were stated but the fire stopping integrity of privately owned flat doors within LA-owned high rises is unknown.
29. Fire doors are fitted to all escape stairs, or a partial number of escape stairs, in 713 buildings (92% of all buildings). Of the 59 buildings (8% of all buildings) where fire doors are not fitted to escape stairs, further details are provided for 56 buildings. A small number detail planned installations, but the majority clarify fire doors are to be fitted to flat entrances, rather than escape stairs.
30. Sprinklers or other forms of automatic fire suppression systems (AFSS)<sup>8</sup> are reported as present in 300 buildings (39% of all buildings). Information is missing for eight buildings (1%). The most common type of system is sprinkler (261 buildings, 87% of those with AFSS), then mist (35 buildings, or 12% of buildings with AFSS), with other forms of system present in three buildings (2% of those with AFSS). For those buildings where sprinklers or other forms of AFSS have been identified, they are most commonly found in bin stores (240 buildings), flats (23 buildings), and common corridors or stairwells (23 buildings). For 38 buildings, alternative AFSS locations were provided by free text response – of these, 31 buildings have AFSS located in car parks.

### **Conclusions and next steps**

31. This summary report is based on information held in the HRI collection in February 2020 and should be treated as a snapshot in time. The HRI exercise has been a comprehensive undertaking and the efforts of those involved in its compilation are acknowledged.
32. Realising the objective of the Ministerial Working Group on Building and Fire Safety for a central source of information on key aspects of the construction and fire safety features of high rise domestic blocks, it is also a significant first step towards the recommendations in the Hackitt Report for a 'golden thread' of good quality information. It is also central to related work of the Ministerial Working Group e.g. in establishing the extent of the use of external High Pressure

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<sup>8</sup> The most common form of automatic fire suppression in residential buildings is water sprinkler systems to BS 9251 however some systems may include water mist systems to BS 8458. Partial AFSS is common in communal bin stores. The Scottish Government intend to legislate for automatic fire suppression systems in all new build social housing, new build flats and certain new build houses in multiple occupation by April 2021.

Laminate (HPL) cladding, and in the development of fire safety guidance for high rise buildings.

33. Beyond the fundamental information collated in the HRI (e.g. on building location or completion date), unknown data remains and the collection has also identified a number of potential issues which have been or are being addressed with relevant bodies. These include:
- ACM – in the period following the Grenfell Tower fire, data was collected on buildings with ACM-PE installed. This data collection was coordinated through Local Authority Building Standards departments. The Scottish Government has since continued to engage with relevant Local Authorities on plans for replacement and management of ACM-PE cladding on buildings.
  - Fire doors – requirements for fire doors in high rise housing have changed over time. Prior to 1 May 2005 requirements were for doors providing 30 minutes fire separation, with the requirement thereafter for 60 minutes fire separation. Older fire doors should still provide resistance and even non-fire rated doors should provide some resistance to fire. Where HRI returns indicate fire doors are not fitted to flat entrances or escape stairs, follow-up is being undertaken to enquire why this is the case and what actions are being taken. Scottish Fire and Rescue Service (SFRS) has also been made aware.
34. With the conclusion of the 2020 HRI exercise, data shall be collected from the SFRS on reported buildings regarding any outstanding defects highlighted through their operational assurance visits. SFRS undertake operational assurance visits to high rise domestic buildings in Scotland, with a Standard Operating Procedure in place for these to take place on a quarterly basis. The purpose of these inspections is to obtain information for operational purposes and to ensure compliance with Regulatory requirements relating to the common areas of private dwellings.
35. As the HRI is to be an annual undertaking, it may be expected that any outstanding defects identified through the 2020 exercise shall be addressed as required in future iterations. Given the HRI's scale and scope, and the challenges of delivering an inventory for the first time, it can be further expected that data collection processes will be refined and improved for future exercises. There will also be an iterative process of improvement while questions are considered and improved where necessary for future data collections.

## ANNEX A

### HRI QUESTIONNAIRE

#### Disclaimer:

Where the provision of data highlights an issue with the building then it is the responsibility of the building owner to undertake remedial action. If, through analysis of this data, the Scottish Government becomes aware of the building issues which may be of interest to the relevant enforcement authorities then we may pass this on.

Updates are provided to the best awareness of those completing the ProcXed system.

Section 1 General Information			Completion Rate (percentage) <sup>9</sup>
1.1	In what Local Authority is the building located?	Drop down 32 local authorities	100%
1.2	Who is the building owner?	Drop down options: LA; RSL; private	100%
1.3	What is the building address?	Split by Address line, city, post code	100% (where at least a building name, first line of address or post code was given)
Section 2 Building Information			
2.1	When was the building completed?	Drop down: options by decade from 1950s-2010s (this format matches the original inventory)	99%
2.2	What is the estimated remaining lifespan of the building?	Drop down, 5 year increments from 0 to 100+. i.e. 0,5,10,...100+	79%
2.3	What is the height of the floor of the topmost storey above ground level in metres?	Field for direct entry, limited to whole values from 18+.	98%

<sup>9</sup> Completion rates exclude records where an answer is not required due to a previous response, but include those cases which are unknown if missing, due to a non-response to a previous question.

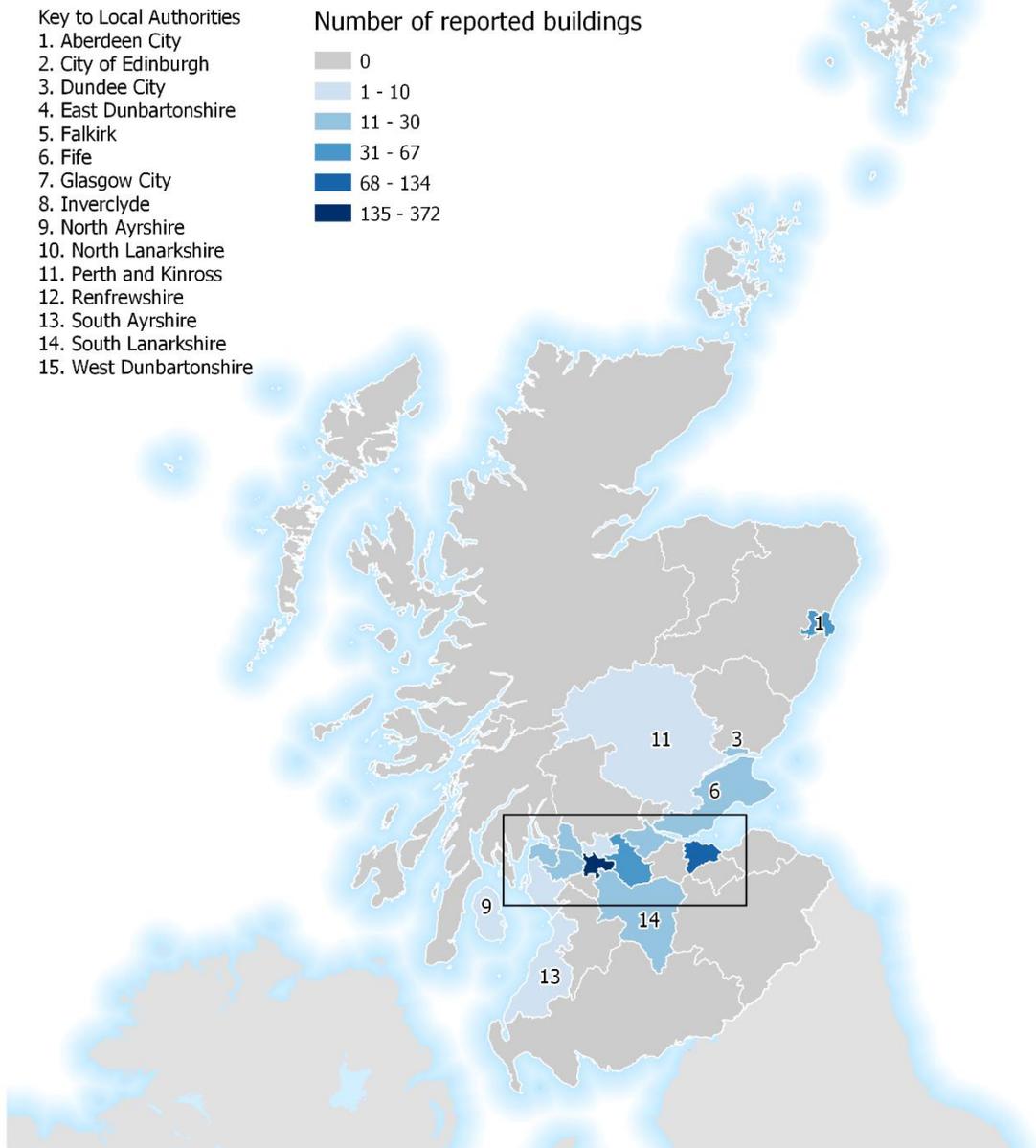
2.4	How many storeys above ground level are in the building?	Field for direct entry, limited to whole values	100%
2.5	What is the total number of flats in the building?	Field for direct entry, limited to whole values	100%
<b>Section 3: Construction</b>			
3.1	What is the construction type of the building?	Multiple responses checkbox, with notes option where specified:  <ol style="list-style-type: none"> <li>1. LPS – concrete</li> <li>2. LPS - Solid cross-lam timber</li> <li>3. LPS – cassette</li> <li>4. LPS - Structural insulated Panels</li> <li>5. Concrete frame</li> <li>6. Steel frame</li> <li>7. Other (specify in notes)</li> </ol>	99%
3.1.1	If this is an LPS-type building, does it have a mains gas supply??	Yes / No	87%
3.2	Does the building have rendered External Wall Insulation (EWI)?	Yes / No	99%
3.3	Does the building have any Aluminium Composite Panels	Yes / No	100%
3.3.1	If yes, please identify type	Multiple response checkbox options, with notes option where specified:  <ol style="list-style-type: none"> <li>1. Polyethylene (PE)</li> <li>2. Fire retardant (FR)</li> <li>3. A2 Limited combustibility</li> <li>4. Other (specify in notes)</li> </ol>	98%
3.4	Does the building have any other type of external wall panels?	Yes / No	98%

3.4.1	If yes, please identify type	Multiple response checkbox options, with notes option where specified:  <ol style="list-style-type: none"> <li>1. Masonry infill panels</li> <li>2. Other metal composite panels</li> <li>3. High pressure laminate boards</li> <li>4. Stone</li> <li>5. Slate</li> <li>6. Granite</li> <li>7. Terracotta Tiles</li> <li>8. Solid Metal Panels</li> <li>9. Rainscreen Insulation Board</li> <li>10. Zinc</li> <li>11. Concrete Panel</li> <li>12. Other (specify in notes)</li> </ol>	97%
3.5	Are there any insulation materials exposed in the external wall cavity?	Yes / No	97%
3.5.1	If yes, please identify type	Multiple response checkbox options, with notes option where specified:  <ol style="list-style-type: none"> <li>1. Expanded polystyrene</li> <li>2. Polyisocyanurate foam</li> <li>3. Stone Wool</li> <li>4. Phenolic foam</li> <li>5. Other (specify in notes)</li> </ol>	88%
<b>Section 4: Fire Safety</b>			
4.1	How many escape stairs does the building have?	Enter whole number	100%
4.2	Are fire doors fitted to flat entrances?	Yes - all / Yes - partial / No	97%

4.2.1	If no, please provide more details		94%
4.3	Are fire doors fitted to escape stairs?	Yes - all / Yes - partial / No	100%
4.3.1	If no, please provide more details		92%
4.4	Are there any outstanding defects that have been highlighted by SFRS through their operational assurance visits?*	Yes / No  *This information will also be requested from SFRS	
4.4.1	If yes, please provide more details	Free text	
4.5	Is the building fitted with sprinklers or another form of automatic fire suppression? (note this does not include portable/ personal automatic fire suppression equipment)	Yes / No	99%
4.5.1	If yes, please indicate type of system	Multiple response checkbox options, with notes option where specified: 1. Sprinkler 2. Mist 3. Other (specify in notes)	100%
4.5.2	If yes, please indicate locations where this suppression is installed.	Multiple response checkbox options, with notes option where specified:  1. Flats 2. Common corridors and stairwells 3. Bin store 4. Refuse chute 5. Other (specify in notes)	100%

## ANNEX B

# Reported Domestic High Rise Buildings by Local Authority



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