Heritage Fire Consultancy Limited

Fire Safety Report V 6
The National Trust
Erddig Hall, Wrexham

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Introduction

Erddig Hall is a Grade I listed country house situated just south of Wrexham, within Erddig Park and Gardens. Owned and maintained by the National Trust, the house was built by Thomas Webb in 1684. Extensive changes were made in the 1790s by re-casing the west front of the house in stone and building the new kitchen, domestic offices, and stable yard. Little has changed since then, so the house, fixtures, fittings, and collections are all historically significant.

The Hall is a stone structure with wooden framed interior of four levels comprising ground, first, second and third floors with central attic above, accessed through a small stair (F). Another two attics are above the North and South bays, accessed through hatches in third floor rooms T03 and T14. The front elevation to the West and the rear elevation to the East feature two grand external stone staircases up to the principal rooms on the first floor. There are two main internal staircases A to the south, which rises from the ground to third floor and B to the North which serves the ground, first and second floors.

All floors are open to the public, with exhibitions on the ground, first, second floors and part of the third floor, which contain numerous displays related to the history of the house, owners, and servants.

This report, commissioned by Fleur Gordon, Senior Surveyor for the National Trust, details the existing fire performance of Erddig Hall, Stable Yard, Outer Yard, Lime Yard and ancillary buildings and makes recommendations for improvement. These recommendations are aimed at reducing the risk of fire spread to ensure the safety of visitors, staff, contractors, and the house with contents. The National Trust fire risk assessment dated 10.01.22 has been considered and are referenced in the door schedule as they arise.

Ideally accidental fires will be contained within the room of origin so that they can be controlled by:

- running out of fuel or oxygen or
- extinguished by staff or the Fire and Rescue Service.

Fire normally spreads in an upward direction and, if not controlled, will continue until the roof structure is involved. At this point weakening of the roof timbers will cause collapse and the fire will then spread in a downward direction, floor by floor, by-passing any horizontal fire barriers. The main thrust of the recommendations in this report are therefore aimed at preventing this upward fire spread. Many of the doors, particularly to former servant's rooms, are not suitable for upgrading because of their lightweight construction and inappropriate door furniture. To compensate, additional door sets are recommended to avoid unsuitable upgrading to historically sensitive doors.

This report is arranged by topic and then floor level with the door schedule, risk matrices and plans shown as appendices.

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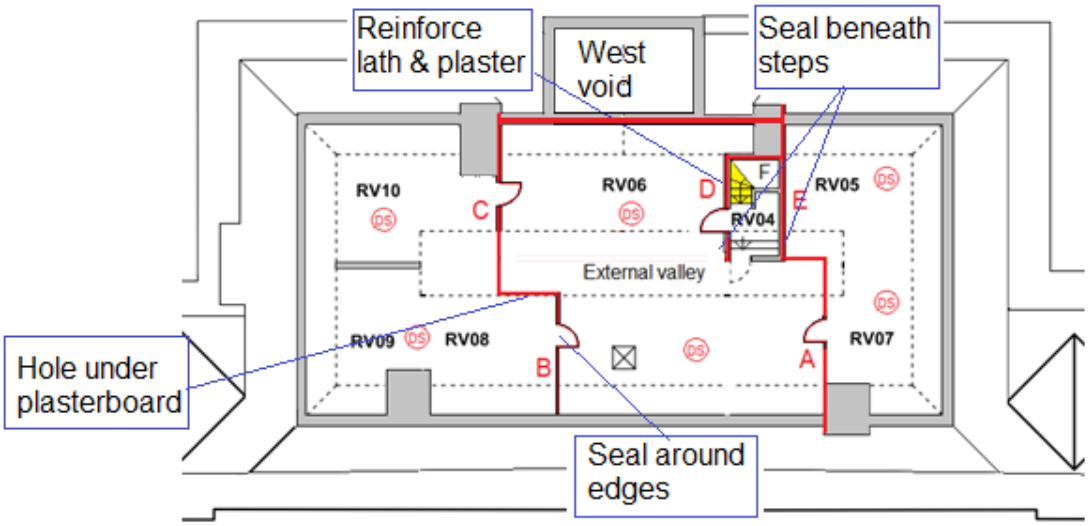
Item	Page	V2 Changes
1	51	Layout of Stable Yard offices updated
2	44-54	Proposed detection added to plans
		V3 changes;-
1		Awaiting decision on the position of new GF fire doors protecting stair A.
		V4 changes
1	23	Baize door G1 managed closed
2		New GF doors based of stair A changed to fire curtain
		V5 changes
2	26	Door G24 is not required to be fire resisting but needs repairing.
3	26	Door G25 utility room does not need a self-closer as is kept shut (but one is going to be supplied anyway).
4	45	Step removed from plan of half landing Ground/First stair A.
5	45	Doors protecting stair A changed to fire shutter
6	31	Door S6 clarification as per schedule
7	8	Roof voids above north and south wings to be improved (Item 2.1).
		V6 Changes
1	3	Contents page updated
4	10	Roof voids Stable Yard and Old Kitchen
4.1	10	The Old Kitchen roof void
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4.3	11	All stable Yard roof fire barriers
4.4	12	Crack in tack room ceiling above STG05
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4.6	12	Stable ceiling above STG02 and STG03

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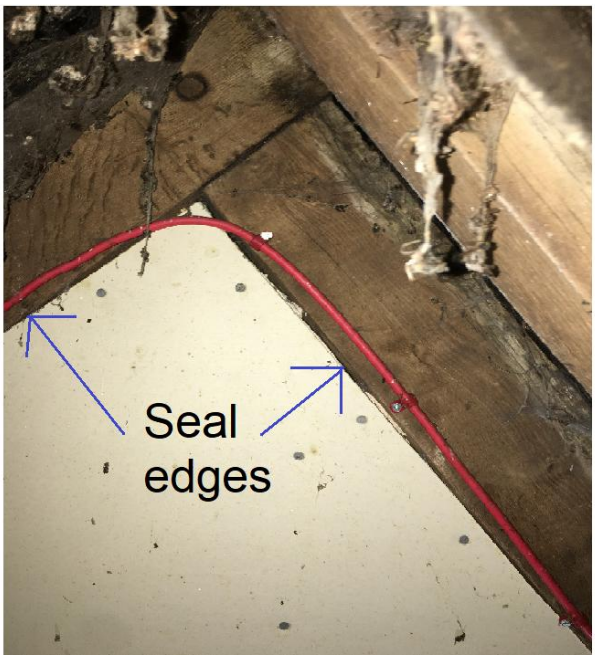
1. Central roof void above Mansion

The compartmentation within the central roof void is generally very good with either brick-built partitions or fire-line boards on roof trusses, as shown in red and lettered for identification below. The main issues which should be addressed are shown on the plan below and in the following paragraphs.

Central mansion roof



1.1. **Barrier B** should be sealed around the top edges with an intumescent mastic.



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Adjacent to the South side of partition B, the underside of the plasterboard has not been sealed. This should be filled with compressed mineral wool. This also applies to other barriers with similar holes.

Underside of Barrier not sealed



1.2. **Partition D** is around the staircase and is one of the more critical protective barriers because the underside of the stair and the door at the base of the stair provides insufficient fire protection.
South of the barrier has a mixture of lath and lime plaster and plasterboard. The laths are a bit too close together at mid-height, so the plaster is not keyed sufficiently, and is likely to fail if attacked by fire. If the fire were already in the loft, the laths would burn rapidly, and the partition would also fail.

Barrier D lath and plaster



The keying of the plaster is fine at the top and bottom of the partition, where the laths are wide enough for the plaster to be pushed through but is not satisfactory mid-level at the height of the door handle.

The hole at the bottom right-hand side of the partition is beneath the steps leading up to the external door to the roof valley.

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There are several options to improve the situation with the lath and plaster as follows.

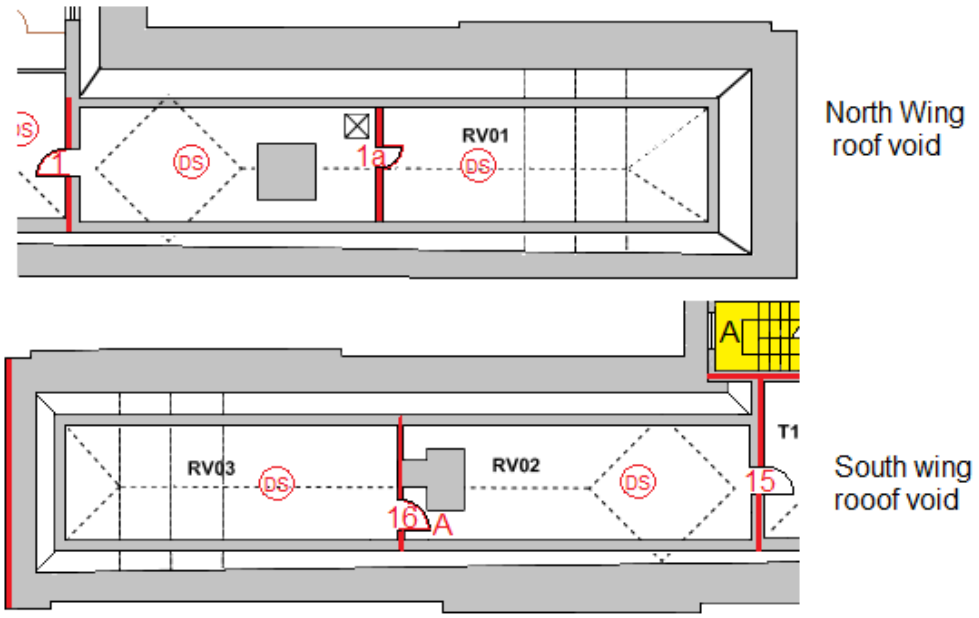
a) Fill between the timber frame with 50mm Ablative Rockwool batts, sealed around the edges with intumescent mastic; or
b) Provide a lath and 25mm lime plaster skin on this side of the partition. The edge of the door frame is in the way of the timber, so it would need an additional baton attached to the upright for fixing the laths; or
c) Provide fire-line board to this side of the partition, which would also need a baton attached to the upright behind the door frame.

The hole at the base of the right-hand side should either be sealed with an ablative Rockwool batt or stuffed with compressed mineral wool. This should also be applied to same hole on the North side of the steps.

The hole at the apex of this partition should be effectively fire stopped with an intumescent mastic.

2. Roof voids above North and South wings

The two roof voids above the North and South wings are at a lower level than the central roof void and are accessed via hatches in rooms T03 and T14. The compartmentation is reasonable, but some minor works are required as detailed below. The South roof void RV02/RV03 fire barrier has been created in line with the chimney breast, whilst the North roof void fire barrier is brick-built in line with a masonry wall below (between rooms S05 and SO3) rather than the chimney breast, which isn't central.



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2.1. Roof void South Wing.

The door and hatch in the South wing is recorded in the fire door schedule but is repeated here for completeness. Hatch T15 is made of two plank doors, similar to miniature stable doors, faced with Masterboard or Supalux. The bottom door is vertical and the top one is in line with the sloping ceiling.

Top leaf



Bottom leaf



The top leaf is damaging the edge of the fireline board on the bottom leaf when opening the hatch. I recommend it is protected with a thin baton of wood about 10mm thick and 25mm wide screwed to the face of the fireline board level with the top

Door T16 is fitted with two sets of combined intumescent and cold smoke seals with a self-closing device and is held open with a magnet linked to the fire alarm system. The door catches on the seals despite the strength of the closing device and the very small door leaf. The smoke seals aren't required in this instance as the door is not protecting an escape route, so replacing the combined seals with intumescent seals is recommended. The self-closing device can then be adjusted to allow the door to close more slowly to avoid bouncing off the stop. Just replacing the outermost seal might be sufficient, so it will be a case of trial and error.

The fire barrier in the South wing has been constructed with a 60-minute fire blanket (Firefly Stamper), reinforced on one side with planks of wood. A breach is evident where cables and a purlin run through it. This hole can be sealed with compressed Rockwool pushed into the cavity.

This barrier together with the barrier containing door 16 does not seal against the underside of the roof covering, so a 50mm wired mineral wool batt should be fixed between the existing fire barrier and the second common rafter with metal fixing bars, on each side of the barriers.

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Hole in fire barrier for passage of cables and purlin



Wired mineral wool to be fixed from above fire barrier to second rafter



2.2. Roof void North Wing

The North wing door T1 is the same construction as the South wing door T15, so should have the fireline board protected with a small baton screwed to the top face.

The mineral wool covering the partition between the loft and room T03 provides some fire resistance but has slipped at the top. The presence of bats are evident at the apex.



Rockwool is missing at apex.

If possible, the mineral wool should be replaced with 50mm Ablative Rockwool batts between the joists and sealed at the edges with an intumescent mastic.
If not possible, the gap at the top should be filled with compressed Rockwool if or when the bats are not there.

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3. Roof void to West of building

The West roof void is accessed via a sloping hatch at third floor level. This hatch has a fire door blank on the inside so should give 60 minutes fire resistance. The void does not appear to link with the main roof void.

Hatch to West roof void



Fire door blank inside of hatch



4. Roof voids Stable Yard and Old Kitchen

4.1. The Old Kitchen roof void was made accessible on March 30/03/26, and it was confirmed that it does not connect with any other roof void. The East and West elevations aren't connected to any other part of the buildings. The North elevation has a gable end which is higher than the adjacent office KF05 and WC KF03. However, there are cable routes connecting to the roof space above the offices and the opposite roof above the store passage. These require fire-stopping once the new fire alarm cables are in place.

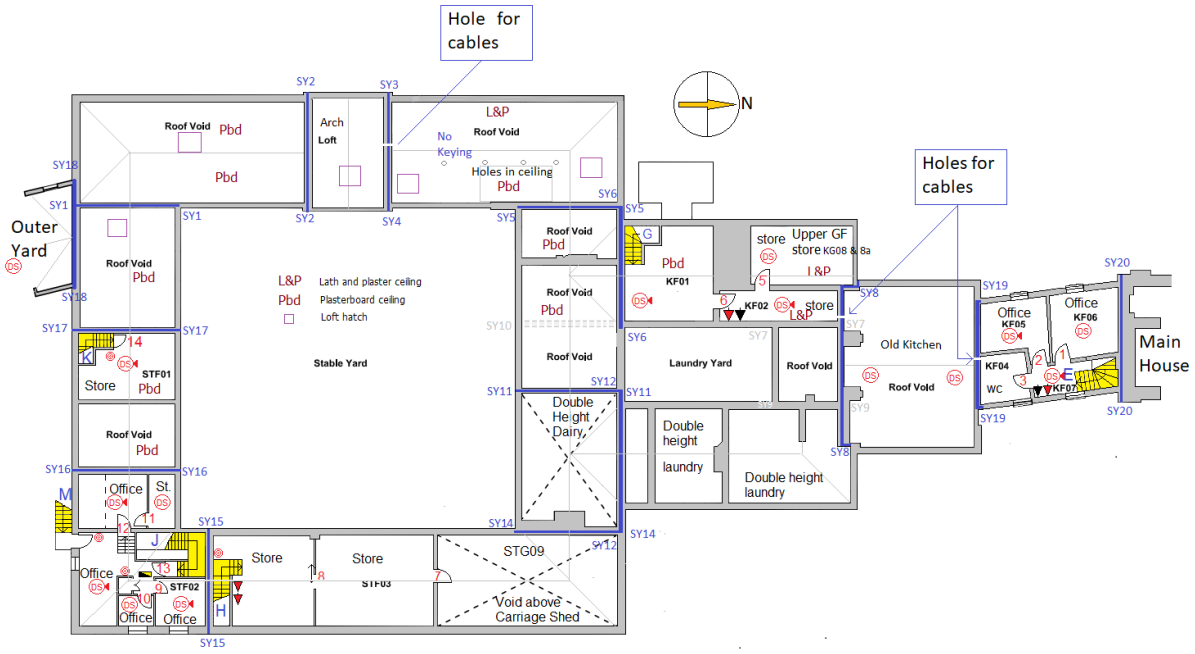
Hole between kitchen roof void and Office void



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4.2. Omission of Stable Yard roof barriers. The roofs are not always fire separated in the locations shown on previous versions of this report and v1 of the fire strategy. Compartment line SY10 between the entrance stable and adjacent tack room does not extend up into the roof so has been removed from the plans. Compartment lines SY7 and SY9 between the laundry, scullery and the store corridor are also difficult to protect from fire due to the construction of the roof, so have been omitted.

Plan to show Stable Yard and Kitchen fire compartments in blue



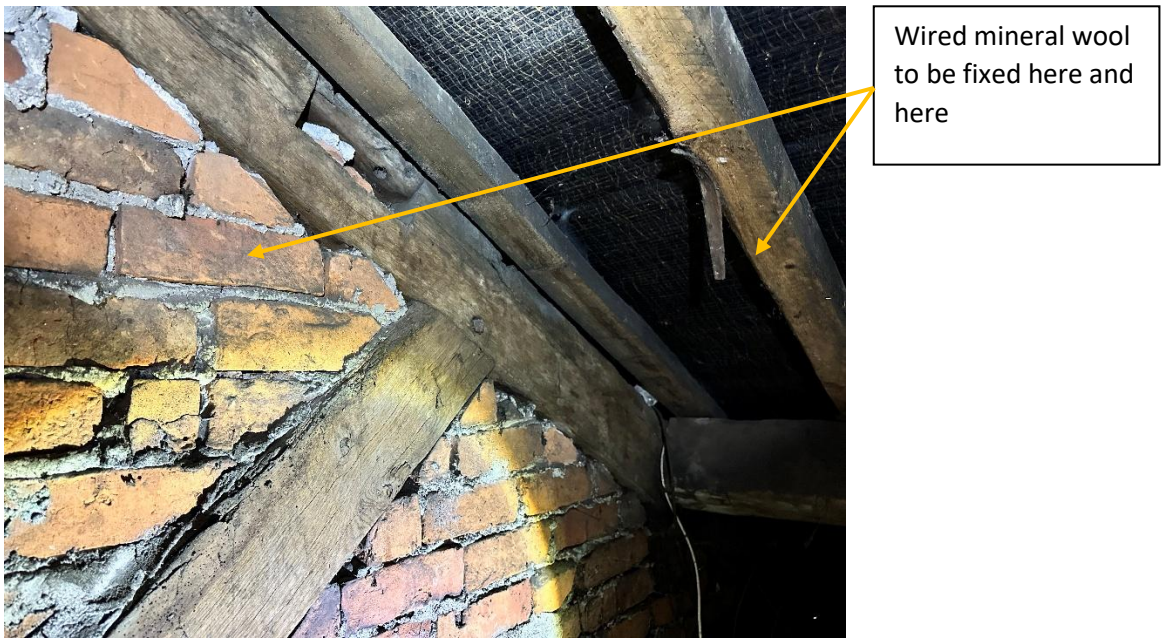
The largest compartment is store STF03 which is divided by a flimsy partition with a lightweight sliding door STF8 and is also connected by door STF7 to the void above the carriage shed. Fortunately, stair H is only accessible from outside the building so is fire separated from the rest of the building. As the Carriage shed and store STF03, which is mainly used for agricultural implements have very low fire loads, it would be practical to keep this area STF03 and SRG09 as a single fire compartment.

4.3. All stable yard roof fire barriers

I recommend that the junction of all the vertical brick barriers and undersides of the roofing felt are made fire resisting by sealing the gaps with wired mineral wool batts, taken back to the nearest rafter that is a full space away from the wall. The ecologist may be agreeable with the new wired mineral wool with the black membrane, but if not, they could be covered with fireline board to make them more bat friendly.

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Example of fire barrier (SY11 above Tack room & Dairy)



4.4. Tack room ceiling

The tack room plasterboard ceiling has a large crack between boards. This should be sealed with joint compound reinforced with joint tape. The joist adjacent to this crack seems to be rotten and might need reinforcing.

Crack in tack room ceiling

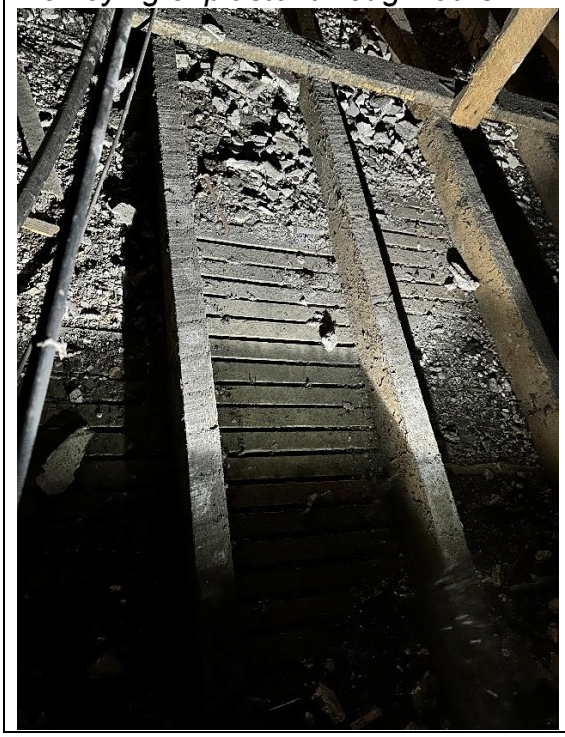
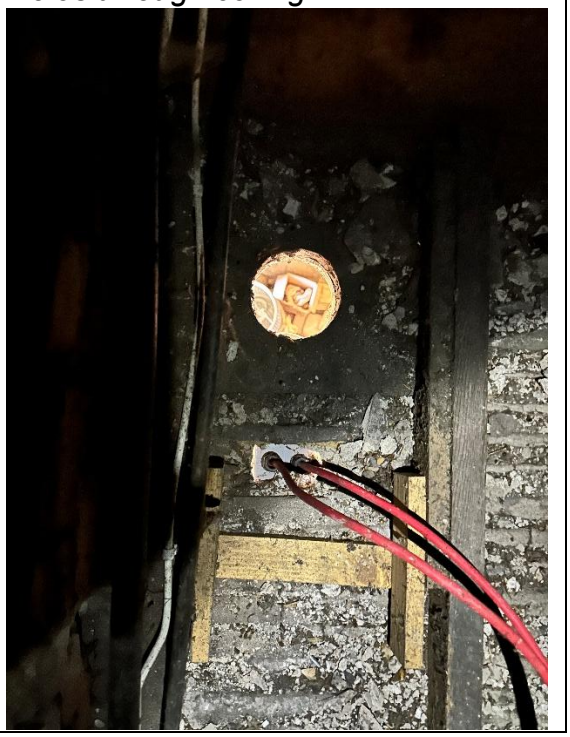


4.5. Stable ceiling above STG02 and STG03

The ceiling above STG02 and STG03 is in poor condition with failed keying, a row of holes (possible formed for recessed spotlights) and a redundant hatch. The stables are used for storage of combustibles which create a high fire loading.

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I recommend that the area below the ceiling with no keying is not used and a barrier erected to prevent people from entering beneath it. A crash deck should be provided if the area below needs to be used for any reason.

No keying of plaster through laths	*Holes through ceiling*
	

After the area below has been made safe, a decision must be made about stabilising the ceiling and making it fire resisting. This might entail under-boarding with plasterboard and skim.

4.6. Loft hatches

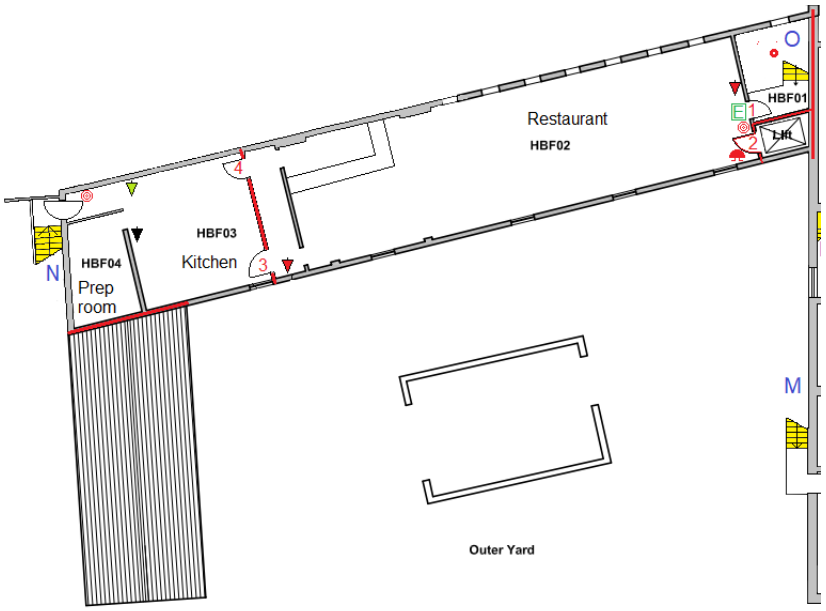
All the lost hatches in the Stable Yard should be replaced with 30 minute fire resisting hatches.

5. Roof Voids Outer Yard

The outer yard only has the first-floor cafe and cafe kitchen which extend up into the roof and the junction with the stable yard can be seen within staircase O. Therefore it has satisfactory fire separation. The kitchen and prep room adjoin the South wing which contains cart sheds and storage with adequate fire separation between the two.

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Plan of the first-floor Outer yard with fire resistance shown in red



6. Roof voids Lime Yard

The Lime yard and Dog yard has a series of single-story buildings with no hidden roof voids. The sawmill, book shop and Cottage have first-floors only.

7. Third Floor Mansion

The third floor of the mansion poses the highest fire risk to the building. It contains dense storage which gives the highest fire loading and lightweight doors, with little or no fire protection to the loft space.

The storage area has the most sources of unsupervised ignition in the form of electrical faults in the humidistat-controlled heaters. The matrix results for the storerooms indicate the doors need upgrading to FD30s standard and the central corridor result indicates a full upgrade wouldn't provide sufficient fire protection.

Door T4 which should protect the stair to the loft, is in a very poor condition, with some minor repairs that would be ineffective in the severity of a fire that could be expected in the central corridor. The panels are only 7mm thick at the edges, which would burn through in about 11 minutes with a charring rate of 0.63mm/min. Upgrading this door would cause a lot of damage and would be ineffective because the stiles and rails with their tenon joints are not robust enough to prevent distortion in a fire.

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Lightweight door T4



Poor condition of door T4



Cross corridor door-set T18 has received some fire protection upgrade works in the form of intumescent paper on the panels. This is a good example of how an upgraded door will not give adequate fire protection, because the stiles and rails are too narrow to avoid distortion and the surrounding frame has gaps through it as can be seen in the photograph below.

Door T18 with intumescent covering and narrow stiles and rails



Frame behind door with large gaps on the top and edges



There are three ways of addressing this issue,

a) reducing the fire load,
b) introducing a suppression system, or

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c) creating new fire barriers.

I'm assuming the creation of new fire barriers will be the most attractive and least costly alternative, so this is explored in the introduction to the fire door schedule on pages 17-19.

7.1. Third floor Ceilings

Holes in ceilings are the most direct way of fire spreading into the roof void. The ceiling of the electrical cupboard T11 is in poor condition. I recommend it's boarded over with 9mm Masterboard, sealed around the edges with intumescent mastic.

There are holes in the ceilings above stair V to the attic and in room T07 which should be filled either with lime plaster or an intumescent mastic.

Stair V is not underdrawn within the understairs cupboard in room T07 so the cupboard should be emptied, and the opening covered with 9mm Masterboard. Alternatively, the stairs could be underdrawn with plasterboard and skim.

.Holes in ceiling



Holes in ceiling



8. First floor means of escape

The fire exit to West of the property is via an inward opening door to the external grand stone staircase. The door is in a poor condition and sticks on the frame and threshold. At the time of my visit, the door was so tight the room steward trying to open it thought it was locked. When it was eased open it caught on the knob of the right-hand shutter. The shutter did not close properly because of the security bars that are kept there.

It is recommended that

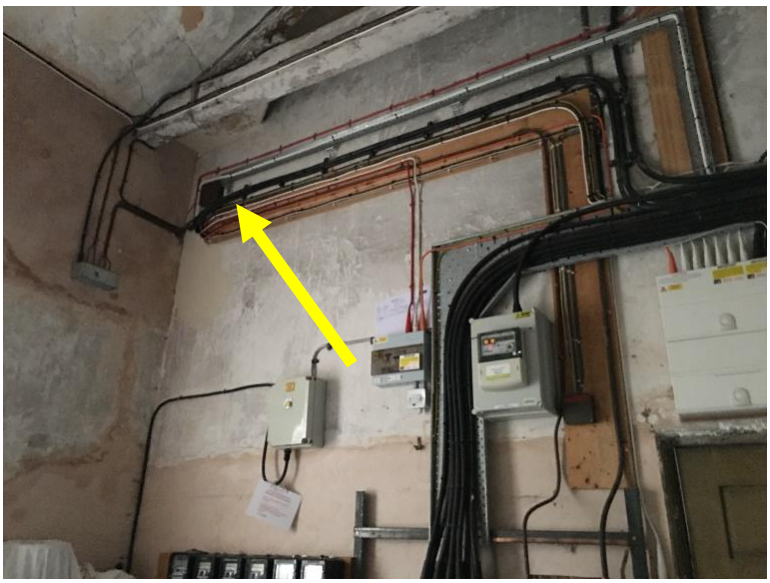
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a) the door is overhauled and
b) The loose joints are cleaned up and re-glued
c) The security bars are located elsewhere or are hung so that the shutter fully closes.

9. Old Kitchen Electrical Intake Room

The mains electrical intake, room KG08, has the site incoming mains. It would be difficult to enclose the switchgear as it's so large. The room itself should therefore provide the fire protection by carrying out the following works.

a) The hole created for the passage of cables near the top of the East wall should be effectively fire-stopped with an Ablative Rockwool batt, sealed around the edges with intumescent mastic.



b) The door is too thin and fragile to afford even 30 minutes fire resistance. I therefore recommended an FD60s door and frame is inserted on the inside of the existing door opening. The existing door could then be made outward opening to conceal the new door.

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Existing door



Incoming mains



10. Old Kitchen

The Old kitchen was designed and built a safe distance from the mansion to prevent fire spread. It's linked by a corridor, but very unlikely a fire would spread to the mansion because of the proposed new fire door next to door 22. The glazed door to the kitchen doesn't need to be fire resisting as its scale and very low fire loading makes it impossible for a fire to reach flashover.

When assessing the spread of fire and smoke, it's always anticipated there will be an ignition source large enough to have the energy to grow and spread. The proposal to use the ranges in the kitchen does not therefore increase the risk of fire.

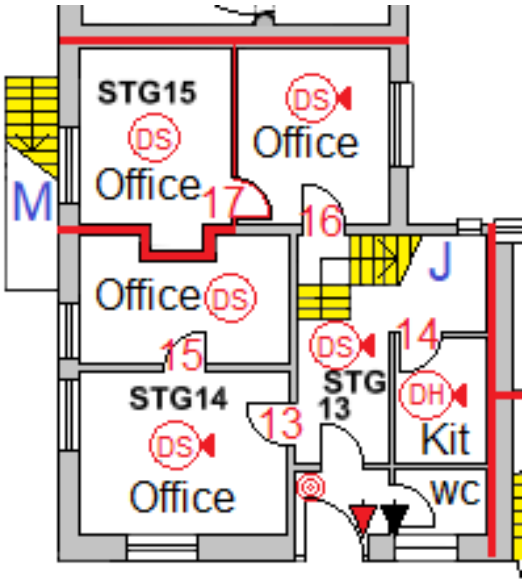
It is expected that a hot works permit system would be in place for this use with a safe system of work.

11. Stable Yard Office

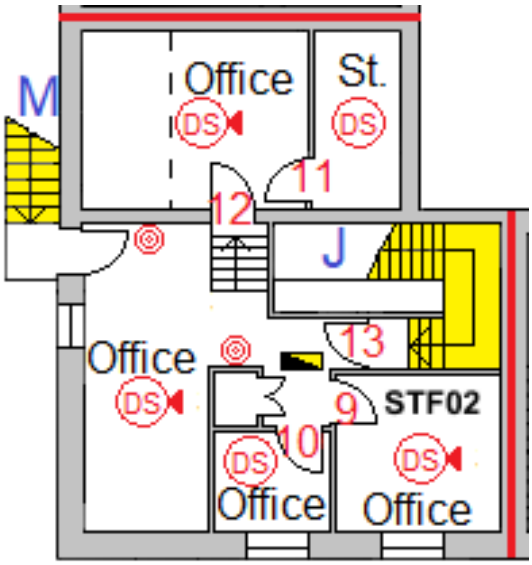
The layout of the Stable Yard offices has changed since the plans were drawn, with new partitions and new offices to the West. The new layout with proposed detection has been used in this report as seen below.

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Ground floor offices



First floor offices



It would be normal practice to make the window next to the stairs fire resisting, but a risk assessed approach shows that if a fire were to occur in office STG15, the internal stair would remain useable, providing the door is fire resisting and self-closing.

12. Access and water supplies for firefighters

Access for fire appliances is via a 3.09m gate to the West of the Mansion House and to the North corner of the gravel drive. The gate is fractionally narrower than the 3.1m recommended in ADB but has been shown to be wide enough for the local fire appliances. Heavy vehicles cannot approach the base of the steps because of the cellars beneath them.

Fire hydrants are adjacent to the drive to the West of the Outer Yard, Stable Block and Mansion House as shown on the site plan. The covers are all painted a conspicuous yellow and the ones on the drive are provided with indicator signs.

Access and water supplies are therefore adequate.

13. Conclusion

Erddig is an excellent example of a building which retains all the original features. This makes it important to avoid altering those items which make it important, including the doors.

By analysing the weaknesses in layout and use of the spaces, it is possible to predict the likelihood of fire and smoke spread and its passage through the building. By making some strategic alterations such as the insertion of 7 new fire door sets, the upgrade of dozens of historic doors is avoided.

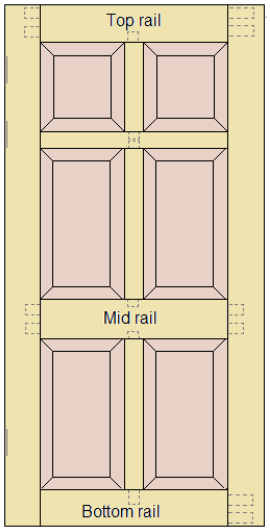
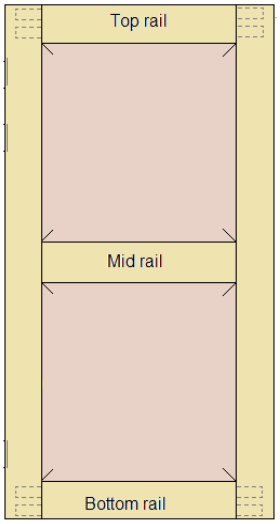
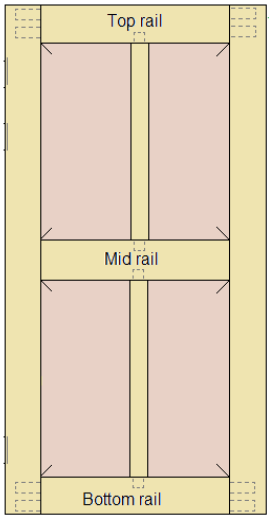
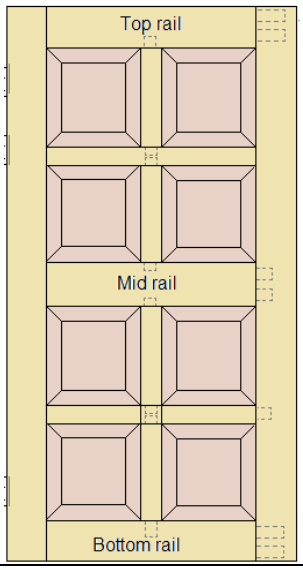
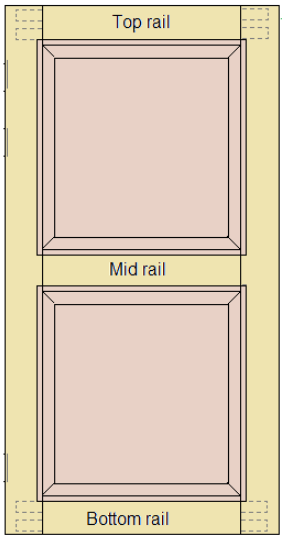
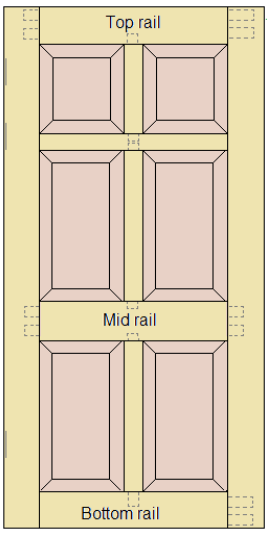
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Those doors in the schedule which do require some intervention would benefit from excellent workmanship from a competent joiner and carpenter, rather than the crude upgrades seen in some of the storage areas.

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Appendix 1. Door schedule

The most common door types in Erddig are shown below and numbered for the schedule. There are also some very rare and unique doors that warrant every effort to retain in its original form. The same applies to the hinges, many of which are original.

Type 1 *Six panel doors with raised and fielded panels and plain on the reverse*  	*Type 2* *Two panel doors with tapered fields on one side and plain on the reverse.*  	*Type 3* *Four panel door with plain or fielded panels* 
Type 4 *Eight panel doors with raised and fielded panels on one side*  	*Type 5* *Two panel doors with planted panels on the rear of the door.*  	*Type 6* *Six panel door raised and fielded on both sides* 

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The existing doors will provide fire and smoke protection to the escape routes long enough for an evacuation to take place. However, for property protection, many of the doors are too thin to resist distortion when exposed to heat for a prolonged period, even if they are upgraded.

To reduce the number of doors that require extensive upgrading works, it is suggested that some strategically placed new FD30s door sets are provided to bolster the compartmentation. These could be plain fire door blanks, painted to fit in with the background, which are held in the open position with electro-magnets or Freedor devices which self-close on activation of the fire alarm.

The ground floor locations are

a) Between the Ground floor Garden Museum room G11 and the passage G06. This would create a fire compartment from East to West along the line of the two chimneys, to include doors G6 and G8. This is also a recommendation of the fire risk assessment of January 2022.
b) More controversial is a new set of double doors across the ground floor main passage G08 to create another compartment line from East to West, also in line with the chimneys. This has now been changed to a proposed fire shutter, so door G14 to the electrical intake room is to remain as existing together with Doors G11 and G12, with their ventilation holes.
c) Between staircase A and corridor G17. This would allow the doors G17, G19 and G20 to remain as existing.
d) To the South of the original external door G22 all as shown on the plan on the next page marked with red asterisks.

Original external door G22 with glazing

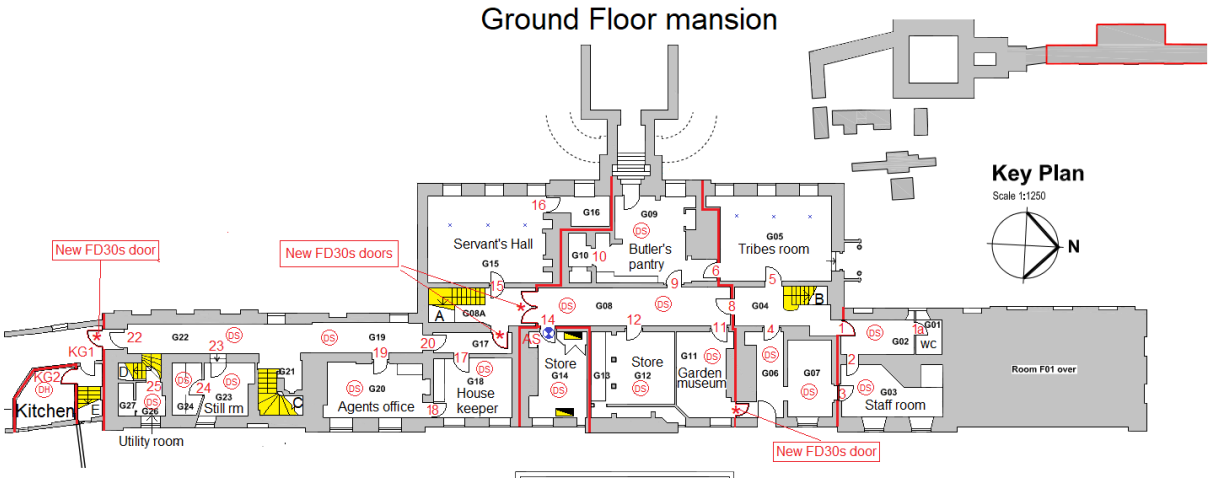


Closed door G22 showing warping

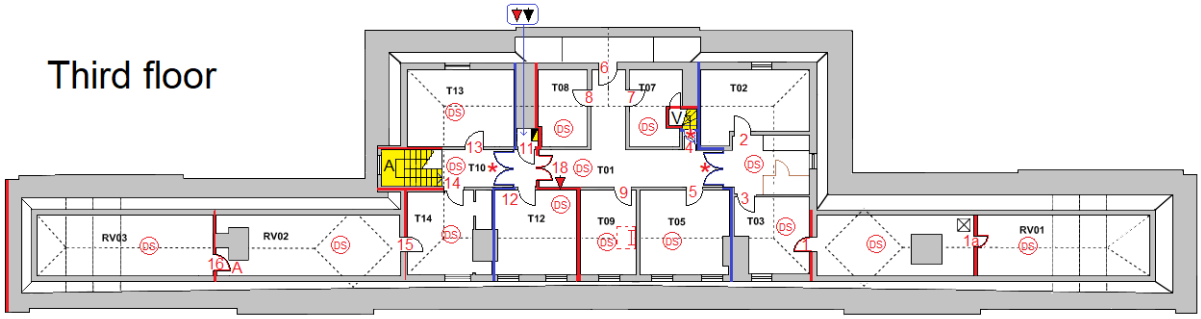


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These four sets of doors will protect and fire separate both main staircases and isolate the main house from the Kitchen and Stable yard. If they are not provided doors 10, 17, 14, 12 and 9 will need to upgraded to FD30s self-closing standard.



The other locations are across the 3rd floor corridor as shown in blue on the plan below and inside the staircase enclosure to the attic. The first set of new cross-corridor doors to the South will protect the third floor from a fire occurring elsewhere in the building and the second set to the North will separate divide the corridor in two to reduce the size of a fire which could start there.



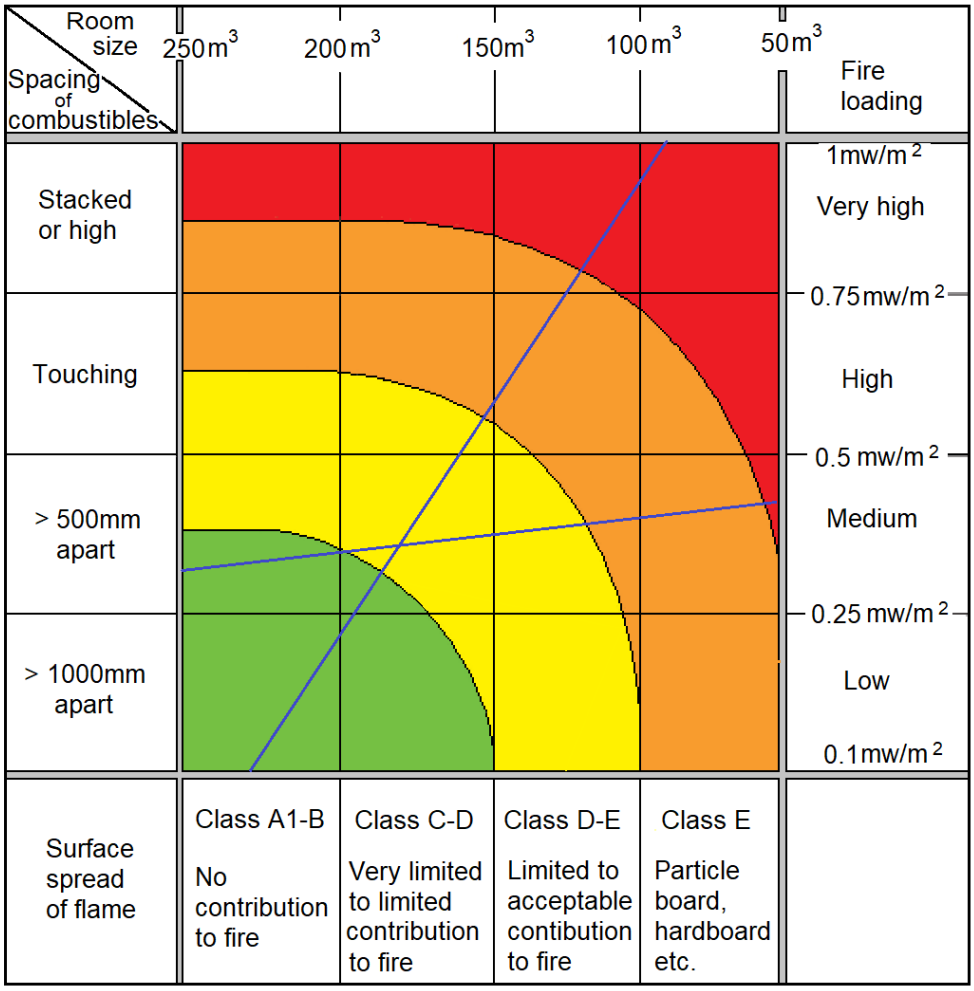
The doors in the table on pages 19 – 39 have been colour coded to show the degree of upgrading they would require to provide 30 minutes fire resistance in a fire occurring in the room they are protecting. The severity of the fire will vary according to the room size, the fire loading, the surface spread of flame rating of the walls and the spacing of the combustibles. The matrix from the HE/IFE publication "Guide to the Fire Resistance of Historic Timber Panel Doors' has been used to give this grading.

Where new doors or cross corridor partitions have been provided the doors which otherwise have required upgrading have been noted, together with doors to rooms that fall outside the range of room sizes that have been tested. In these cases, the colour coding has still been used, but annotated with N/A.

The door numbering follows the room numbers wherever possible, but the prefix has been omitted on the plans for easier reading. For example T05 on the third floor plan above is shown as 5.

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Example of the matrix used to determine the degree of upgrading



	Plus		
Door to have self-closing device or room steward	Door to have self-closing device and cold smoke seals	Door to have self closer, intumescent strips cold smoke seals & 30 min burn through	Door may not afford 30 mins fire protection, consider reducing fire load or fit suppression

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Ground floor											
Door no	Situation	Type	Notes	Frame	Panel	Field	m^2	m^3	Fire load	SSF	Res
G1	Corridor/stair Baize covered Glazed panel with Pyrodur secondary glass.	3	This provides protection between the staff room and stair B. Warped at base with adjusted stop. Recommend:- a) 12mm batwing smoke seals in frame to fill 6 and 7mm gaps. b) The 9mm gap at base is acceptable. c) This door to be kept shut by managing.	33	20	14 Glass panel	Circulation space, but protecting stair B from staff room.			0	
G1a	Toilet door 4 panel	3	Not required to be FR								
G2	Staff room/ corridor	3	Door G1 provides FR for staff room and WC lobby, so G2 does not need to be FR.	33	12		19	47	2mw $0.1/m^2$	0	
G3	Staff room /family museum	N/A	This door has been sealed off and behind board in staff room. Acceptable smoke stopping capability				19	47	2mw $0.1/m^2$	0	
G4	Stair B /corridor open to museum spaces.	5	Very low fire load and passage is connected to Family Museum and Garden Museum rooms. No fire resistance is required if new door is provided across passage to Garden Museum.	33	12						
G5	Tribes room G05 /Stair B	Novel	Steel faced, no strips or seals, but well fitting into frame.				37	96	2.5mw $0.06/m^2$	0	

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G6	Butlers pantry /Tribes room	1	On proposed compartment line, Butler's Pantry has higher fire load than Tribes room.	40	15		24	62	2.5mw 0.1/m^2		
G8	Held open with hook	1	On proposed compartment line. Recommend a) Freedor be provided. b) Pack out bottom hinge to square door in frame.	47	14		Circulation space				
G9	Vertical and horizontal plank door. Butlers Pantry /corridor	Novel	Strap hinges on pintles	50			24	62	2.5mw 0.1/m^2		
G10	Cupboard in Butlers Pantry		Not required as fire door.								
G11	Garden museum/corridor	5	Vent holes drilled in top panel. Very low fire load and room is connected to adjacent passage and Family Museum.	33	16	12	17	42.5	1mw 0.06/m^2	0	N/A
G12	Store/passage	5	Vent holes drilled in top panel. Store permanently ventilated to outside. Locked shut	35	20	15	24	63	5mw 0.21/m^2	0	
G14	Electrical intake/ Passage	2	Already fitted with smoke seals and intumescent strips. Fillet of wood on sloping top of door. Top gap 11mm<15mm, so:- a) thicker fillet required with b) new intumescent strip and cold smoke seal	35	21	15	16	41	2mw 0.13/m^2	0	
G15	Servants Hall/passage, Double swing.	2	a) Either fit combined intumescent strips and cold	45	15		40	99	4mw 01/m^2	0	

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	Protects stair A		smoke seals in edge and top of door, or b) preferably provide a door stop on top and both edges to make the door inward opening and c) fit intumescent strip on door edges and d) batwing smoke seals In corner of stops, e) Hold open device required								
G16	Servants Hall/scullery		Not required to be FR								
G17	Housekeeper's room/passage	1	Glazing above door not FR. If new FD30s door to corridor G17 introduced between passage and stair, no further work required	37	6		16	41	3mw 0.18/m^2		
G18	Housekeeper's room/Agent's office	1	Not required to be FR	37	6						
G19	Agents Office /corridor	6	Higher grade door than others on this floor. If proposed FD30s door to corridor G17 is provided no further work required.	35	25	10	18	45	4mw 0.2/m^2	2	
G20	Corridor/stair A	1	Glazing above door already reinforced with single panel of Pyrodur fire resisting glass.	44	20	12	Circulation spaces				
G21	No door		Opening to stair only				Circulation space				
G22	Corridor/corridor	Unique	Originally an external door. 7 panel with cracked centre panel of glass. Large gap at base. Top	40	20		Circulation spaces				

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			fitted with existing fillet of wood. Warped and does not fit frame. Recommend:- a) supply a new FD30s door and frame to South of this location held open on magnet or Freedor. See item 4 in opening paragraphs.								
G23	Still room/corridor	Unique	Single plank door with six panel frame fixed to front. No upgrade required as very low fire load.	35	21		9.9	35	1mw 0.1/m^2	0	
G24	Still room and prep room	6	Tenon joint on top rail split, door should be dismantled and re glued (and pinned if necessary).	36	20	8	Too small for matrix, but this door is not required to be fire resisting.				
G25	Flat utility room/stair D	3	4 panel with horizontal planks on rear. 4mm glass panels over. Recommend that :- a) the glazing is reinforced by fitting a pane of 30-minute fire resisting glass over the top. Self closer not required as this is kept shut & on public route.	54			Too small for matrix.				

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First Floor											
Door no	Situation	Type	Notes	Frame	Panel	Field	m^2	m^3	Fire Load	SSF	Res
F1	Stair B half-landing/ Chapel corridor	4	Satisfactory condition as it is one of two doors between the Chapel and staircase B	38	33	11	Circulation space			0	
F2	Corridor/Chapel	4	Satisfactory condition as it is one of two doors between the Chapel and staircase B	32	28	10	60	306	6mw 0.1/m^2	B	
F3	Chapel/Chinese room lobby	4	Large gap at top, recommend it is fitted with a fillet of wood glued and screwed or pinned in place.	42	32	10	60	306	6mw 0.1/m^2	B	
F4	Chinese room /chapel lobby	4	Satisfactory condition as it is one of two doors between the Chapel and Chinese room	42	32	10	Too small for matrix			0	
F5	Tapestry room/Chinese room	4	Satisfactory condition and not required to be FR.	48	46	13	13	51	3mw 0.2/m^2	0	
F6	Saloon/Tapestry room	4	On fire line, satisfactory as it is between two large rooms with low fire loads.	38	33	13	13	51	3mw 0.2/m^2	0	
F7	Saloon/stair B	4	Satisfactory as it is from one of the largest rooms with low fire loading Auto closer required	37	37	18	70	264	5mw 0.07/m^2		
F8	Library/stair B	4	Large gap at the top of the door. High fire load, so door to have; - a) fillet of hardwood glued and screwed or pinned to the top	42	39	17	37	140	20mw 0.54/m^2		

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			of the door to reduce the gap to about 4mm, b) intumescent strips to be fitted in routered grooves to top and both edges, c) batwing smoke seals in corner of door stops. d) Panels to be upgraded by gluing Fireface Plus veneer, stained to match, on the fielded parts only of the panels to the library side of the door.								
F9	Entrance Hall/ stair B	3	Top panels glazed, but satisfactory as it is from one of the largest rooms with low fire loading.	48	8mm glass		55	204	9mw 0.2/m^2	0	
F9a	Entrance Hall/ Stair A	3	Auto closer required								
Front door	Entrance lobby external fire exit		This door has suffered from weathering and will need complete refurbishment to ensure it is openable, as it was so stiff it was unclear if it was unlocked. It will probably need dismantling and the joints re-glued and tightened.								

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F10a	Saloon/ Dining room lobby	4	Satisfactory as it is between two of the largest rooms with low fire loading	38	33	14	70	266	6mw 0.1/m^2	0	
F10b	Dining room/ Saloon lobby	4	Satisfactory as it is between two of the largest rooms with low fire loading	37	33	11	66	185	7mw 0.11/m^2	0	
F11	Saloon/Stair A	4	Satisfactory as it is between one of the largest rooms and stair B with low fire loading	38	28	11	66	185	7mw 0.11/m^2		
F12	Drawing room/Stair A	4	Satisfactory burn through capability as it is between large room and stair A with low fire loading. Large gap of 11mm at top so;- a) fillet of hardwood should be glued and screwed or pinned to the top of the door to reduce the gap to about 4mm, b) Auto closer required	50	13		40	152	9mw 0.2/m_2		
F12a	Drawing room /Entrance hall.	4	On fire compartment line. Satisfactory condition.	48	12		40	152	9mw 0.2/m_2		
F12b	Drawing room /Entrance hall.	4	Also, on fire compartment line. Satisfactory condition.	32	10		55	204	9mw 0.2/m^2	0	
F13	Dining room/Stair A	4	Satisfactory as it is between large room and stair A with low fire loading. Auto closer required if room not stewarded permanently	38	17	6	66	185	7mw 0.11/m^2	0	

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F14	Dining room/ servery	4	On fire compartment line. Satisfactory condition. Latched shut	38	26	10	9	36	6mw 0.66/m^2	0	Too small
F15	Servery/ top of stair C	1	Replace combined intumescent strip and cold smoke seal with intumescent strip only in the door and batwing smoke seal against the stop.				9	36	6mw 0.66/m^2	0	Too small
F16	Flat, Spare room/lobby	1	Not required to be FR								
F17	Flat, Spare room/lobby	1	Not required to be FR								
F18	Flat entrance door/stair D	Fire door blank	FD30s fire door blank in good condition, no further work required.								
F19	Flat, Spare room/lobby	1	Not required to be FR								

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Second Floor											
Door no	Situation	Type	Notes	Frame	Panel	Field	m^2	m^3	Fire Load	SSF	Res
S1	Store/corridor	1	Existing crude upgrade possibly because of single direction of travel				20	89	7mw 0.35/m^2	0	
S2	Store S03 /corridor S02	1	Existing crude upgrade				21	94	8mw 0.38/m^2	0	
S3	Store 03 /store S01	1	Not required to be FR as between rooms.								
S4	Store 05 /corridor	1	Existing crude upgrade				7.7	34	4mw 0.5/m^2	0	N/A
S5	Store 06 /corridor	1	Batwing smoke seals required in corner of stops.	32	20	08	23	81	5mw 0.02/m^2	3	
S6	Corridor stairs/ Stair B landing	1	Full flight down from risk rooms/corridor, so burn-through not a problem. Provide batwing smoke seal.				Circulation spaces				
S7	Blue bedroom/ room S06	1	Not required to be FR as between rooms								
S7a	Blue bedroom/Print room	1	Not required to be FR as between rooms								
S8	Blue bedroom lobby/ stair B	1	Lobby approach to Blue bedroom, door satisfactory.	30	21	6	23	78	5mw 0.2/m^2	3	
S8a	Blue bedroom /lobby	1	Lobby approach to Blue bedroom, door satisfactory.	30	21	6	23	78	5mw 0.2/m^2	3	

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S9	S09 / top landing Stair B	1	Satisfactory as it is between large room and top of stair B with low fire loading	32	20	8	37	122	6mw 0.2m^2	1	
S10	Store / top landing Stair B	1	Door satisfactory as kept locked shut and good fit.	30	19	8	10	33	Too small for matrix	0	N/A
S11	Print rm/top landing stair B	1	Door satisfactory	31	20	9	15	50	3mw 0.2/m^2	0	
S12	Gallery /stair B landing	1	Doors provide separation between stairs A and B, so recommend batwing smoke seals only.	30	19	8	35	115	4mw 0.11/m^2	0	
S13	Gallery/Stair A landing	1	Doors provide separation between stairs A and B, so recommend batwing smoke seals only.	30	19	8	35	115	4mw 0.11/m^2	0	
S14	Cupboard / landing stair A	1	Cupboard door keep locked shut						Too small for matrix	0	N/A
S15	WC / landing stair A	1	Note required to be FR								
S16	Nursery/WC	1	Not required to be FR								
S17	White bedrm / landing stair A	1	Provide batwing smoke seals for cold smoke stopping capability	32	10	6	27	81	5mw 0.2	3	
S18	Nursery/ landing stair A	1	Although West Nursery has low fire loading, nursery S19 below has high fire load, so a. intumescent strips to be in routered grooves to top and both edges,	45	20	10	29	93	3mw 0.1/m^2	0	

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			b. batwing smoke seals in corner of door stops. c. Panels to be upgraded by gluing Fireface Plus veneer, stained to match on the fielded parts only of the panels to the nursery side of the door.								
S19	Nursery/nursery	1	Fillet of hardwood to be glued and screwed to top of door, where gap up to 25mm exists. No other works as door S18 above protects stair.	44	22	10	13	42	7mw 0.5/m^2	0	
S20	Landing stair A /corridor S20	1	Satisfactory condition							0	
S21	Red bedroom /corridor S20	1	Satisfactory condition	32	21	8	23	76	5mw 0.2/m^2	0	
S22	Corridor S22/ corridor S20	1	Not required as fire door as internal door S22a provides adequate protection.							0	
S22a	Corridor S22/ corridor S20	Fire door blank	New FD 30s self-closing fire door in good condition.							0	
S23	Flat bedroom /corridor S22	1	Satisfactory condition.	32	20	5	17	56	6mw 0.35/m^2	0	
S24	Spare room/ corridor S22	1	Recommend a filet of wood on the top of the door as there is a gap 7-15mm. No need for intumescent strips or smoke seals	28	47	32	10	33	3mw 0.3/m^2	0	N/A

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S24a	Flat lounge / corridor S22	1	Satisfactory condition	30	12	7	29	96	5mw 0.17	0	
S25	Flat lounge, stair D landing	1	Satisfactory condition	30	12	7	29	96	5mw 0.17	0	
S25a	Flat lounge /kitchen	1	Satisfactory condition, although the FRA recommends a self - closing device. The Freedor would be suitable here. Intumescent strips and cold smoke seals not required.	38	15	8	29	96	5mw 0.17/m^2	0	
S26	Flat Kitchen/ stair D landing	1	Satisfactory condition, although the FRA recommends a self - closing device. The Freedor would be suitable here. Intumescent strips and cold smoke seals not required.	32	20	8	14	45	4mw 0.3/m^2	0	
S27	WC		Not required to be FR								

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Third Floor and roof voids above N & S Wings											
T1	Store T03 / North roof void	Unique	Vertical planks with fire-line board on rear. Vertical door with sloping hatch above Intumescent strips and cold smoke seals to edges. The sloping hatch is causing damage to fire-line board of the vertical door. It is recommended that a hardwood lipping is applied to the top face of the fire-line board to protect it from further damage. The missing board can be filled with a cementitious filler.					Baton to protect fire-line board			
RV1a	DD 60 hatch in brick wall dividing RV01	Fire door blank	Satisfactory condition								
T2	Passage/store	2	Too small for matrix, but would require full upgrade if over 50m^3 No latch on door	30	10	7	21	42	7mw 0.33/m^2	0	N/A
T3	Passage/store	2	Too small for matrix, but would require full upgrade if over 50m^3 No latch on door	28	13	7	13	26	7mw 0.54/m^2	0	N/A
T4	Stair/passage used for storage	2	Too small for matrix but would require full upgrade if over 50m^3 Door in poor condition, at base of stairs serving roof void. New door recommended.	29	9	7	11	30	8mw 0.7/m^2	0	N/A

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T5	Store/passage	2	Not thick enough for full upgrade. Door is latched.	30	12	7	26	60	8mw 0.3/m^2	0	N/A
T6	Hatch/ West roof void		Vertical planks on hatch with fire door blank behind. Satisfactory								N/A
T7	Store/ side passage	2	Too small for matrix	30	10		5.6	11	2mw 0.36/m^2	0	N/A
T7a	Store/under stair cupboard		Underside of stair not protected. Empty cupboard and fix fire-line board across opening with intumescent mastic around edges so that it cannot be opened. Door could be planted on top of fire-line board if required.								N/A
T8	Store/side passage	2	Too small for matrix	30	10		9	19	4mw 0.44/m^2	0	N/A
T9	Store/passage	2	Too small for matrix. Warped door with planted stop to compensate	30	15	7	15	37	6mw 0.4/m^2	0	N/A
T9a	Hatch to loft in ceiling.	blank	Fire door blank with intumescent strips and cold smoke seals. All satisfactory							0	N/A
T11	Electricity cupboard/ passage and landing of stair A	5	Top and sides of frame have intumescent in the face of the stops. This will push door open if activated. Replace stop and fit intumescent strips and cold smoke seals in top and both edges of the door.	29	40					2	N/A

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			Reduce 25mm gap at bottom of door by fitting 15mm fillet of hardwood.								
T12	Store/landing stair A	2	Good fit at top. 8.5mm at base, which is acceptable	30	13	7	15	30	5mw 0.33/m^2	0	N/A
T13	Bedroom/ landing stair A	5	Sloping top gap 3-7mm. This could be covered with a 12mm batwing smoke seal.	30	45		26	60	5mw 0.2/m^2	0	
T14	Display room/ landing stair A	5	5mm gap at top and 10-15mm at bottom. Fire load includes the cupboard contents. Fit batwing smoke seals to top and sides.	30	45		14	28	6mw 0.47/m^2	0	
T15	Store T014 / South roof void	Unique with T3	Vertical planks with fire-line board on rear. Vertical door with sloping hatch above Intumescent strips and cold smoke seals to edges. The sloping hatch is causing damage to fire-line board of the vertical door. It is recommended that a hardwood lipping is applied to the top face of the fire-line board to protect it from further damage. The missing board can be filled with a cementitious filler.							0	N/A
RV16	FD60 s door between roof voids	Fire door blank	Held open on magnet but catches on smoke seal so does not fully close onto the stops, Remove the combined strips and seals and replace with intumescent strip only.								N/A

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Central roof void above Mansion										
RV1	Stair V /roof void (fire barrier D)	New FD30s	Satisfactory condition							
RV2	Roof void/void Fire barrier A	New FD30s	Satisfactory condition							
RV3	Roof void/void Fire barrier B	New FD30s	Satisfactory condition							
RV4	Roof void/void Fire barrier C	New FD30s	Satisfactory condition							

Ground Floor Outer Courtyard											
Door no	Situation	Type	Notes	Frame	Panel	Field	m^2	m^3	Fire load	SSF	
HBG01	Lift/shop lobby	Steel	Although mentioned in FRA, this door will probably provide 30 minutes fire resistance, but is not necessary as the adjacent staircase is open at the base and top.								
HBG02	Lobby/ shop	Double swing Glass	Not fire resistant, but satisfactory if exit available through upstairs kitchen to external stairs.								
HBG03	Shop/store	FD30s blank	Seal between the frame and wall with intumescent mastic.	45							

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Outer Courtyard First Floor											
HBF01	Stair 0 landing/cafe	V planks on horizontal planks	43mm x 31mm vision panel. Provide batwing smoke seals and Freedor self-closing device	48			109	339	7mw 0.06/m^2	1	
HBF02	Lift/landing	Steel door	Although mentioned in FRA, this door will probably provide 30 minutes fire resistance, but not necessary as the adjacent staircase is open at the base and top.								
HBF03	Kitchen /servery	V planks on horizontal planks	On strap hinges and hooks, but good fit. Hooked open so:- a) Provide Freedor s/c & b) Batwing smoke seals	48			33	102	5mw 0.15/m^2	1	
HBF04	Kitchen /servery	V planks on horizontal planks	On strap hinges and hooks, but good fit. Hooked open so:- a) Provide Freedor s/c & b) Batwing smoke seals	48							
HBF05	Kitchen/exit	Double swing	Faulty hinges that need repair or replacing.								

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Old Kitchen Ground Floor											
KG1	Office stair/ corridor KG01	1	Seal gap above door frame with intumescent mastic	38	36	23	Circulation space				N/A
KG3	Office kitchen/stair	Fire door blank FD30s	Satisfactory								
KG4	Old Kitchen/ Corridor KG01	3	Glazed top panels, Not FR, but very large room with v low fire load so satisfactory, even if oven ranges are in use.				58	291	5mw 0.08/m^2	0	
KG5	Old Kitchen/ corridor KG06	3	Very large room with v low fire load so satisfactory, even if oven ranges are in use.				58	291	5mw 0.08/m^2	0	
KG6	electrics/ corridor KG06	1	Poor quality door, suggest it is replaced with a new FD30s fire door and frame, opening into the room. The existing door could be rehung to open outwards into the corridor.								
KG7	Scullery/corridor KG07	1	Too small for matrix, but low fire load, so no fire resistance required.								
KG8	Store/electric room	3	Between rooms so no FR required.								

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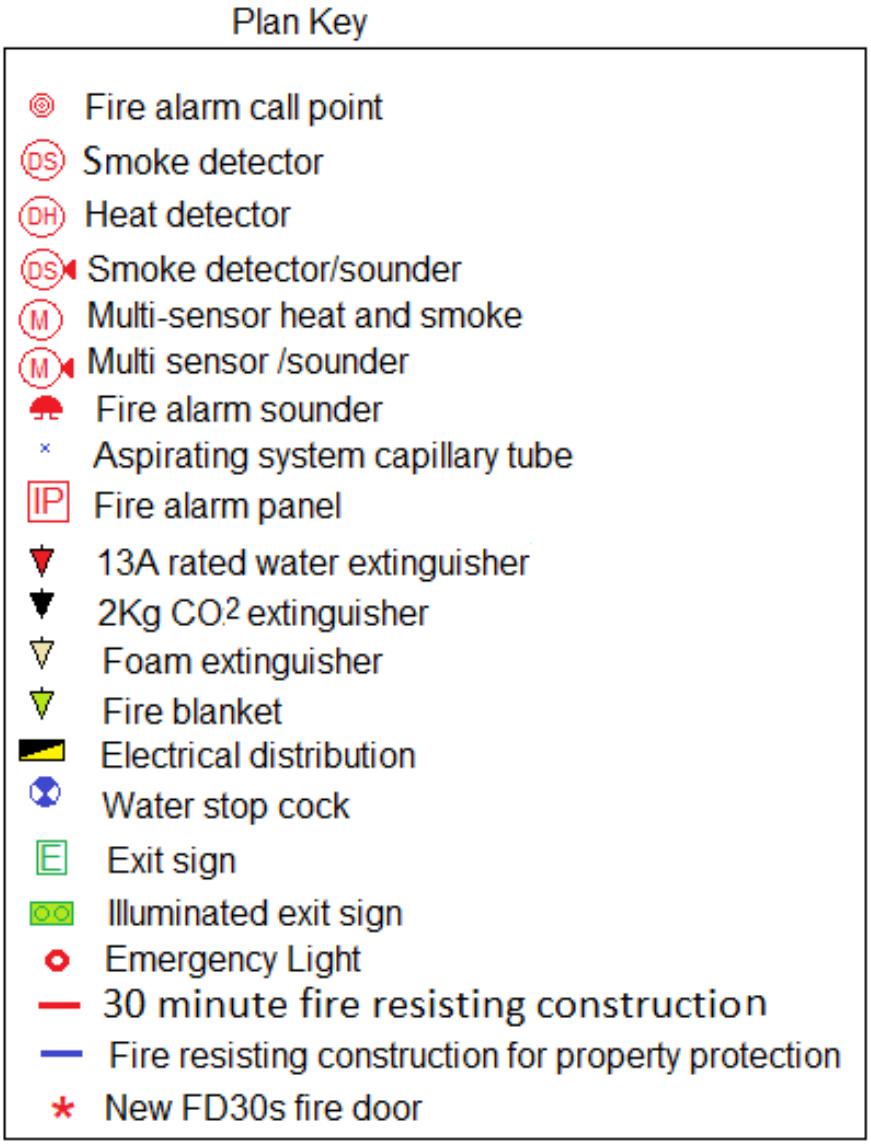
KG9	Stair L/ Sink room	3	Too small for matrix, but low fire load, so no fire resistance required.								
Old Kitchen First Floor											
KF4	WC/landing	3	Not required to be FR								
KF5	Office/landing	3	Self-closing door satisfactory condition				13	31	3mw 0.23/m^2		N/A
KF6	Office landing	3	Self- closing door satisfactory condition				19	47	4mw 0.2/m^2		
KF1	Corridor used as store / landing	Plank door	Very thin plank door with no fire resistance. No action required								
KF2	Store/corridor used as store	3	Very thin door no FR No action required	Consider whole top floor as one compartment as storage only with detection.							
Stable Yard Ground Floor											
STG 1-5	All stable of external doors		Not required to be FR								
STG6	Dairy/passage	3	4 panel plank door, no FR, but OK as only open passage outside	48	10		38	156	2mw 0.05/m^2	0	
STG 12	Waiting area/ passage to laundry yard										
STG13	Office/stair J	FD30s blank	Georgian wired vision panel. Self- closer to be repaired or replaced	44	13 VP						
STG14	Kitchenette /stair J	Hollow core door	No cooking here, so can be left as it is.								

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STG15	Office/Office	Hollow core door	Not required to be FR								
STG16	Office/ Stair J	Hollow core door									
STG 17	Office/Office	FD30s blank	Fit self-closing device	This office has a window opening onto an external stair. If this door is self-closing the internal stair will then be protected from a fire within this office and the external stair can be treated as an accommodation stair and left unprotected.							
Stable Yard First Floor											
STF 7	Store/Carriage shed	Plank door	High level door in Carriage shed, no fire resistance.	22	Treat as one fire compartment with loft						
STF 8	Store/store STF03	Sliding panel	No fire resistance to partition or door		Treat as one fire compartment across both stores						
ST F9	Office/office	Hollow core door	No FR required, 2 directions of travel								
STF 10	Office/Office	Hollow core door	No FR required, 2 directions of travel								
STF 11	Store/office	Hollow core door	No FR required, 2 directions of travel								
STF 12	Office/Office	Hollow core door	No FR required, 2 directions of travel								
STF 13	Stair J Office	Hollow core door	No FR required, 2 directions of travel								
STF 14	Stair K/store	Plank door	No FR required store only above open stone stair								

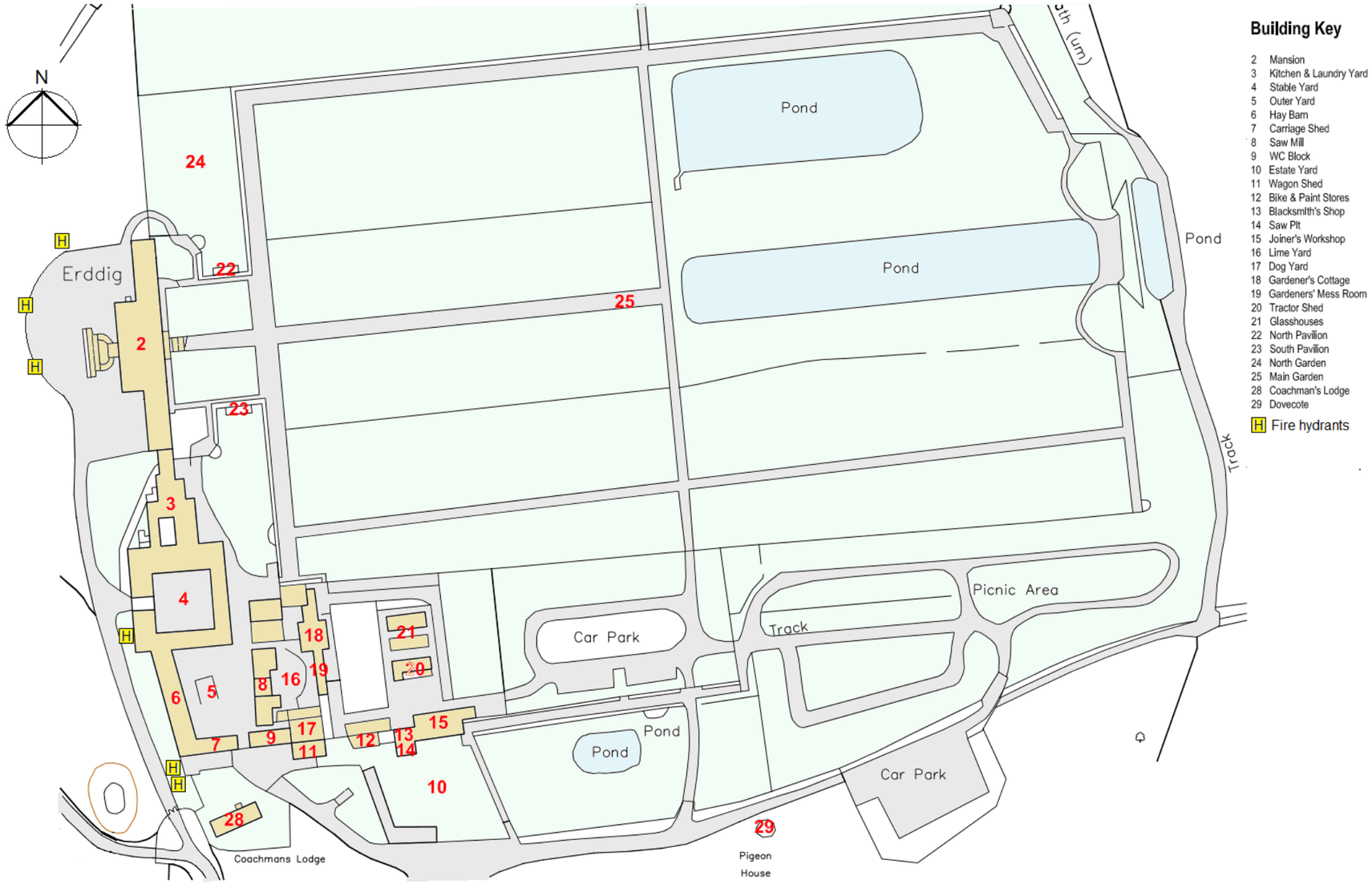
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Appendix 2. Key for plans and plans



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Site Plan



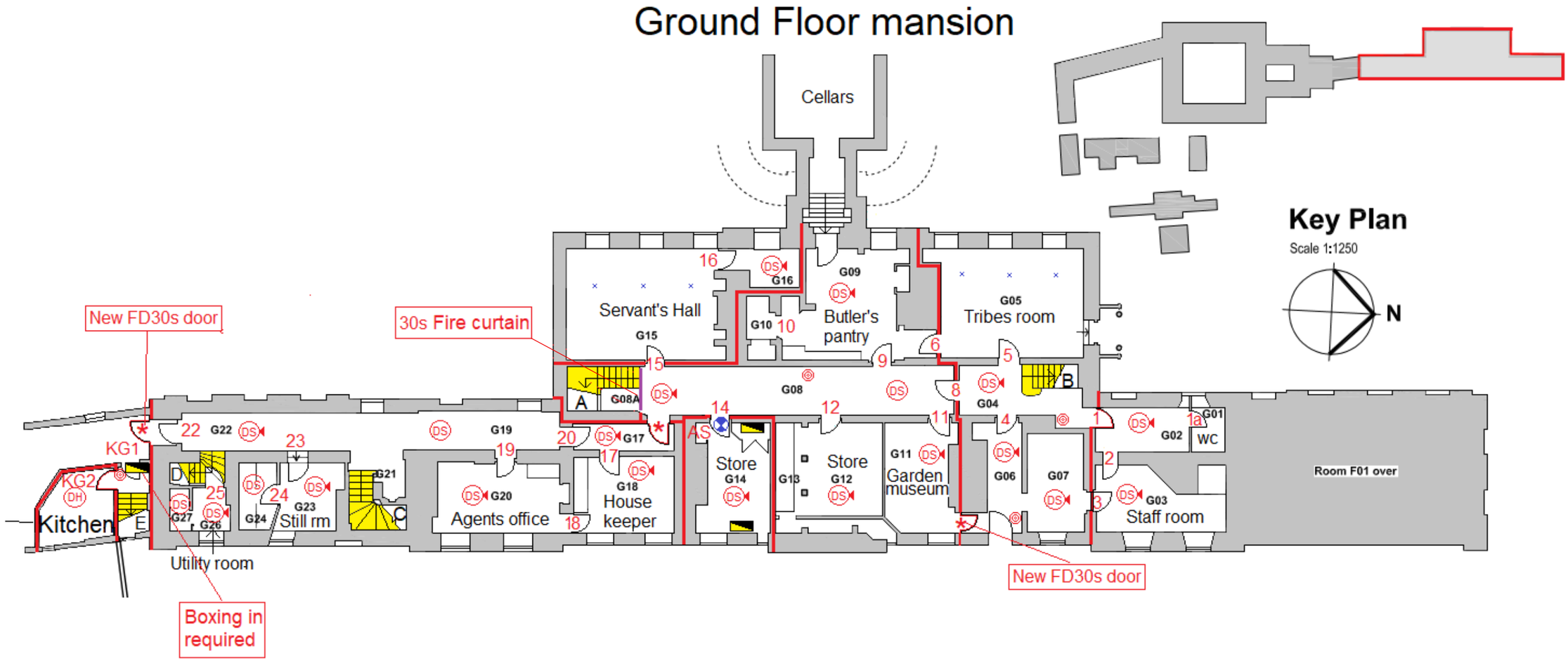
Building Key

2	Mansion
3	Kitchen & Laundry Yard
4	Stable Yard
5	Outer Yard
6	Hay Barn
7	Carriage Shed
8	Saw Mill
9	WC Block
10	Estate Yard
11	Wagon Shed
12	Bike & Paint Stores
13	Blacksmith's Shop
14	Saw Pit
15	Joiner's Workshop
16	Lime Yard
17	Dog Yard
18	Gardener's Cottage
19	Gardeners' Mess Room
20	Tractor Shed
21	Glasshouses
22	North Pavilion
23	South Pavilion
24	North Garden
25	Main Garden
28	Coachman's Lodge
29	Dovecote

H Fire hydrants

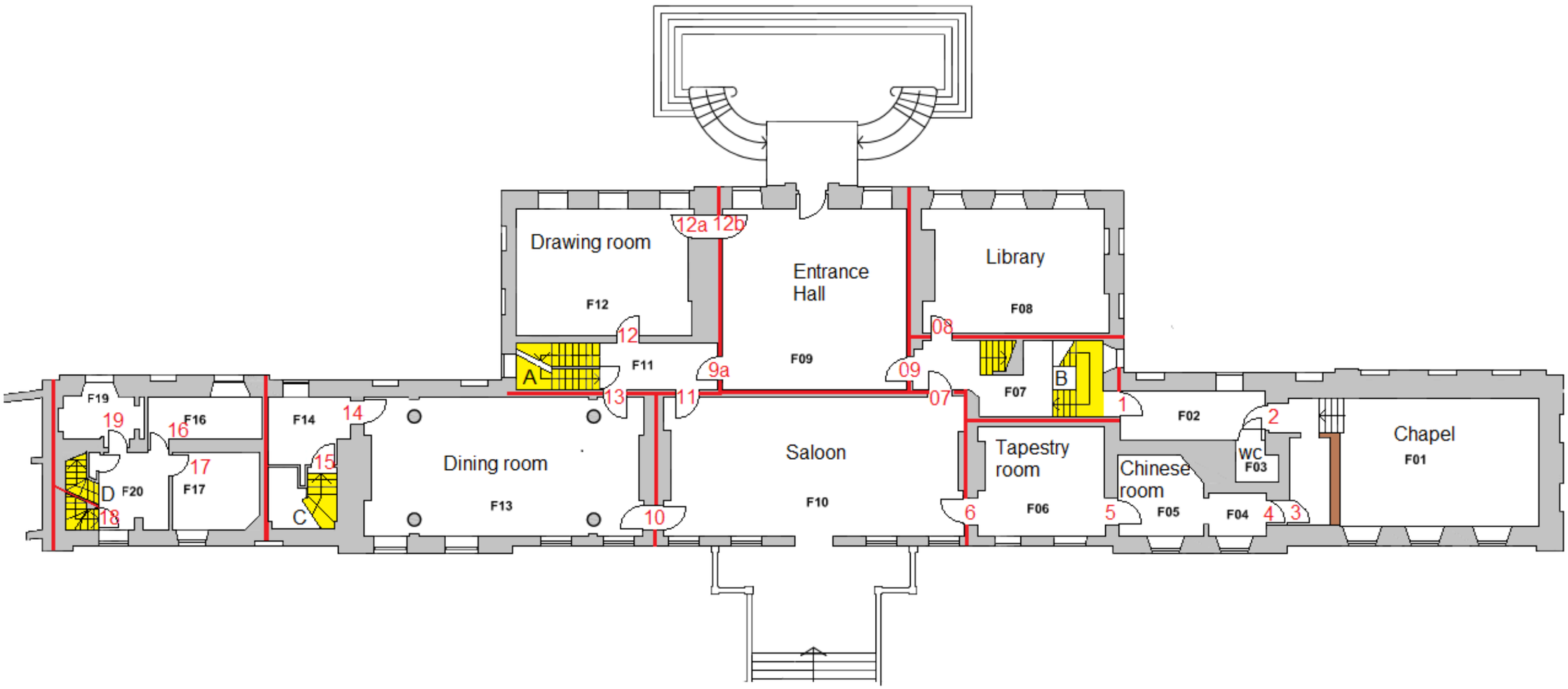
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Ground Floor mansion



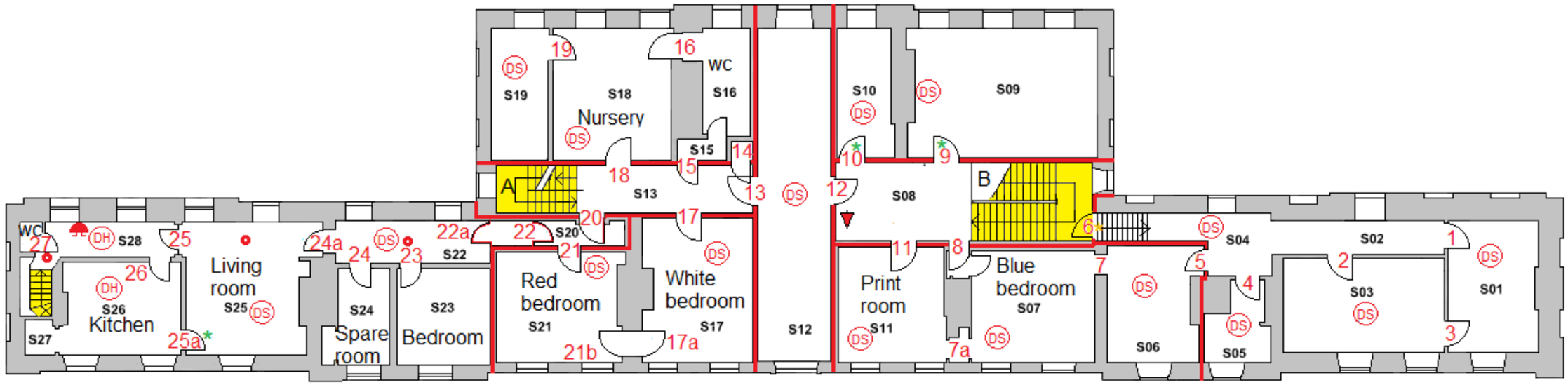
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First Floor



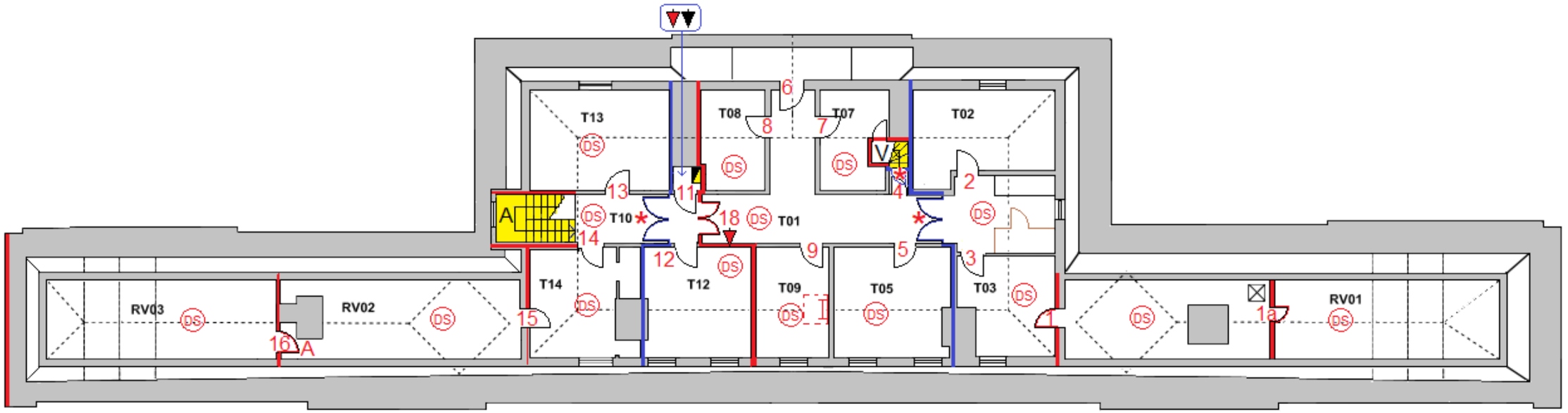
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Second floor



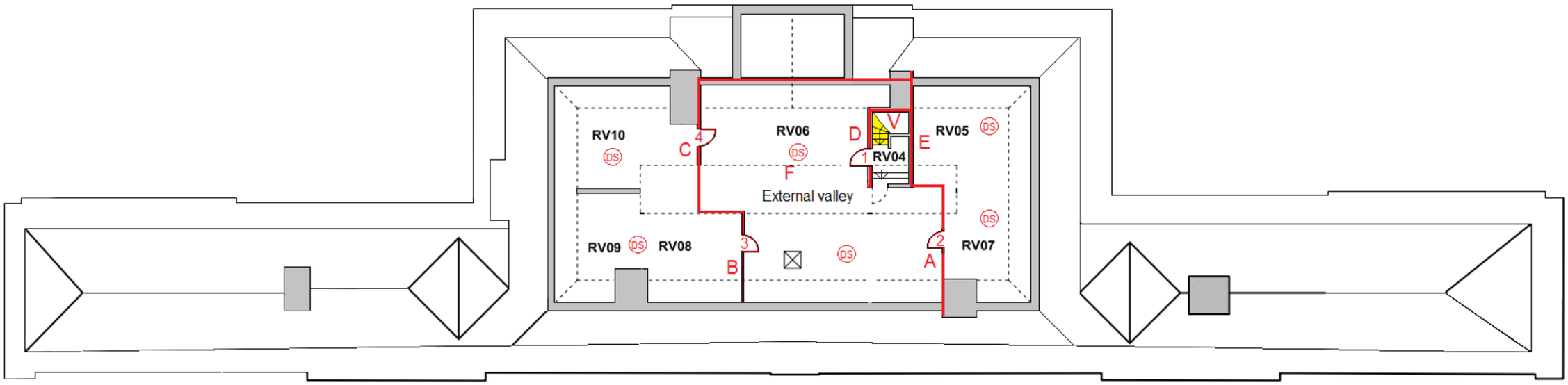
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Third floor



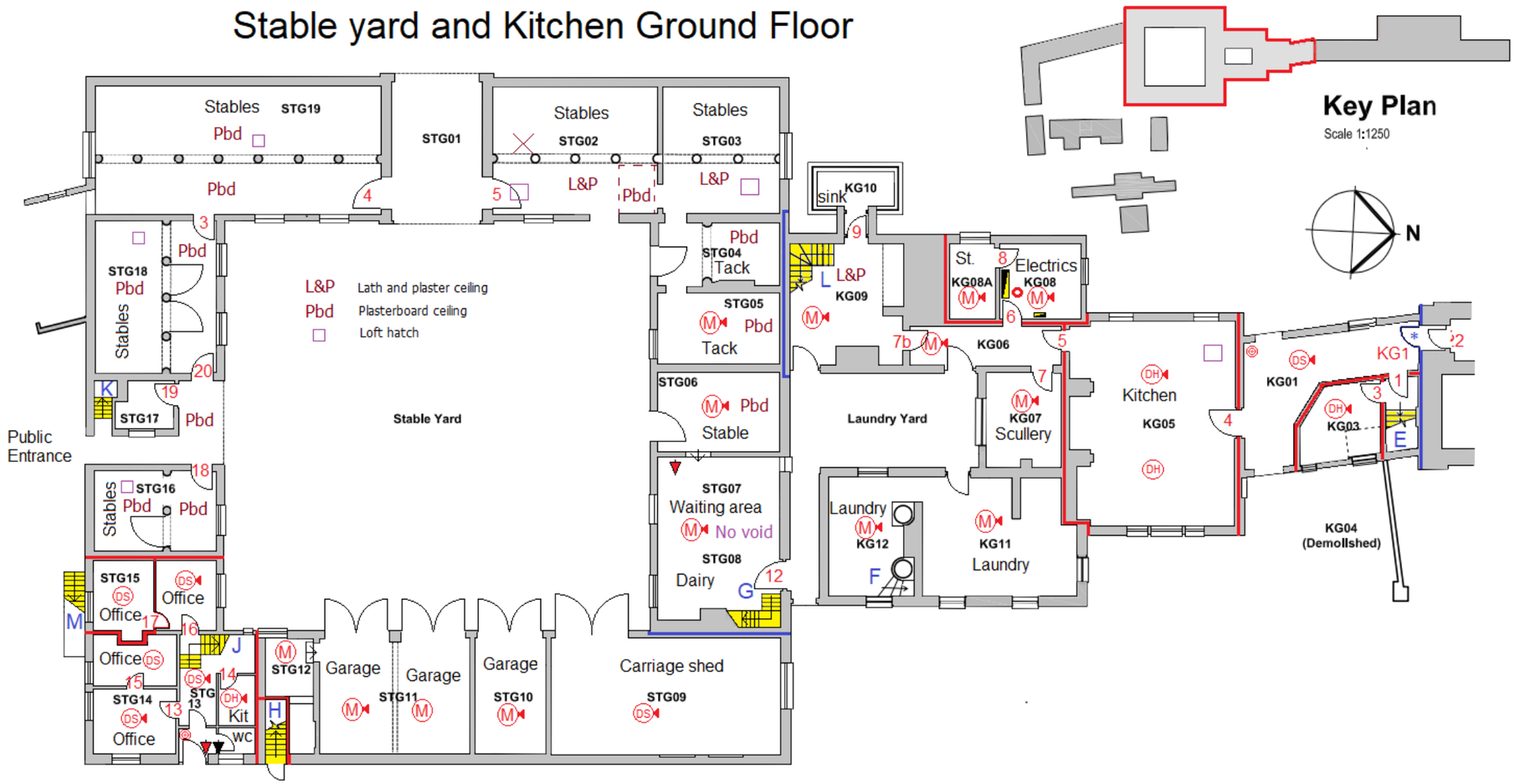
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Mansion Roof



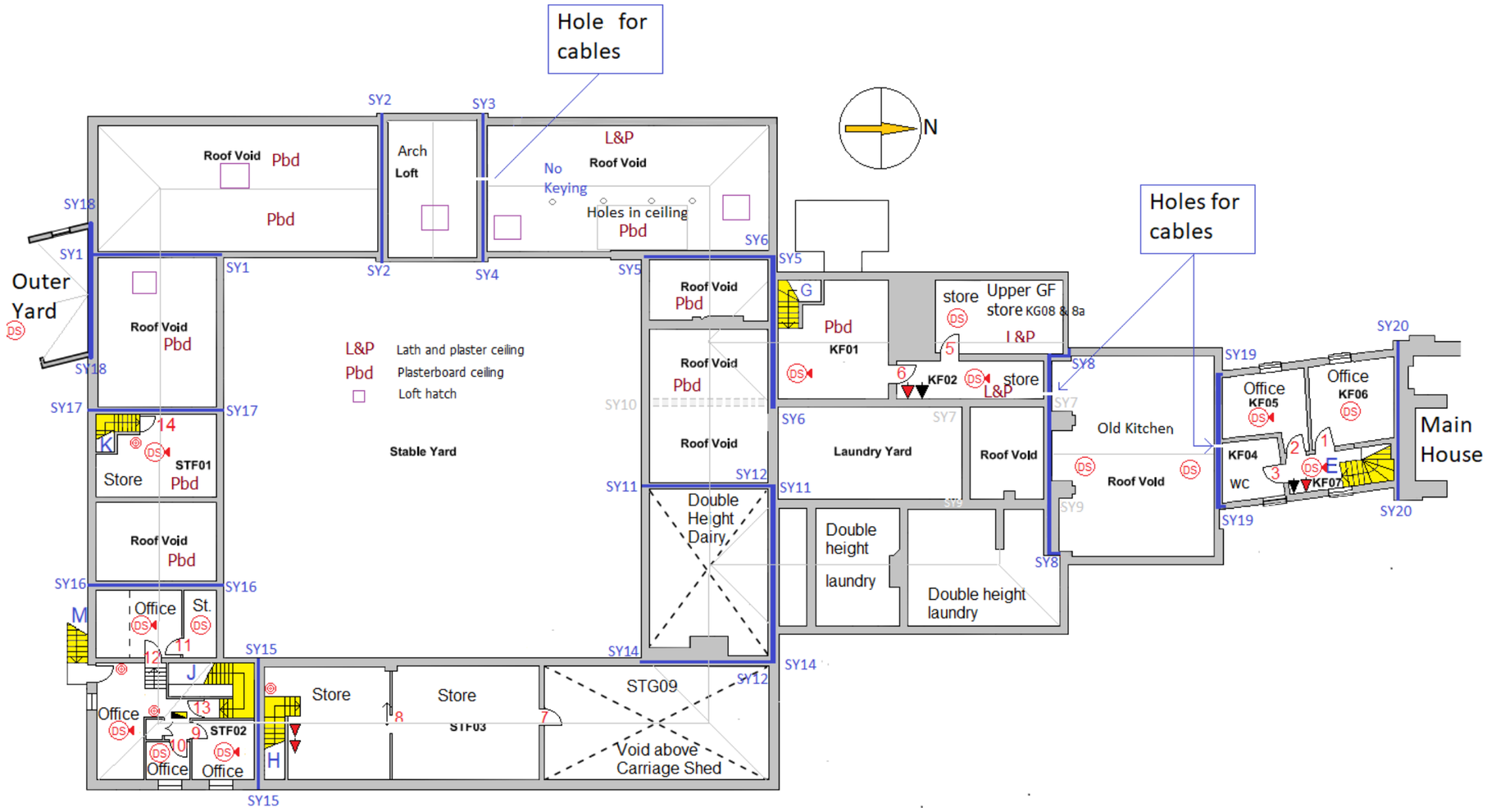
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Stable yard and Kitchen Ground Floor



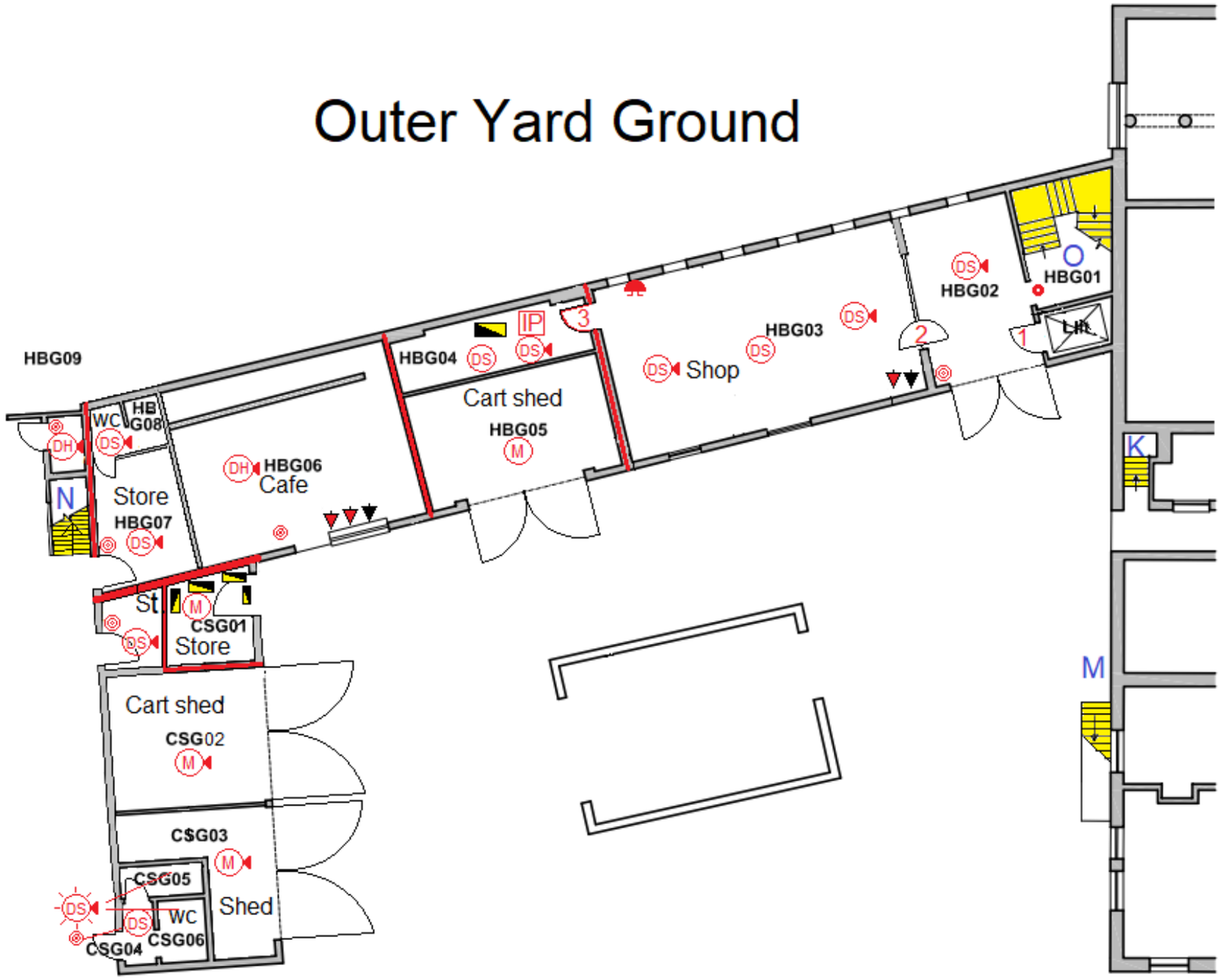
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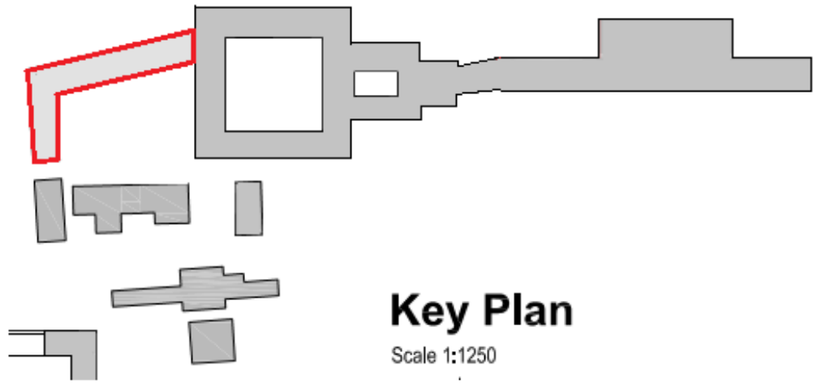
Stable Yard and Kitchen First Floor and Roof Voids



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Outer Yard Ground



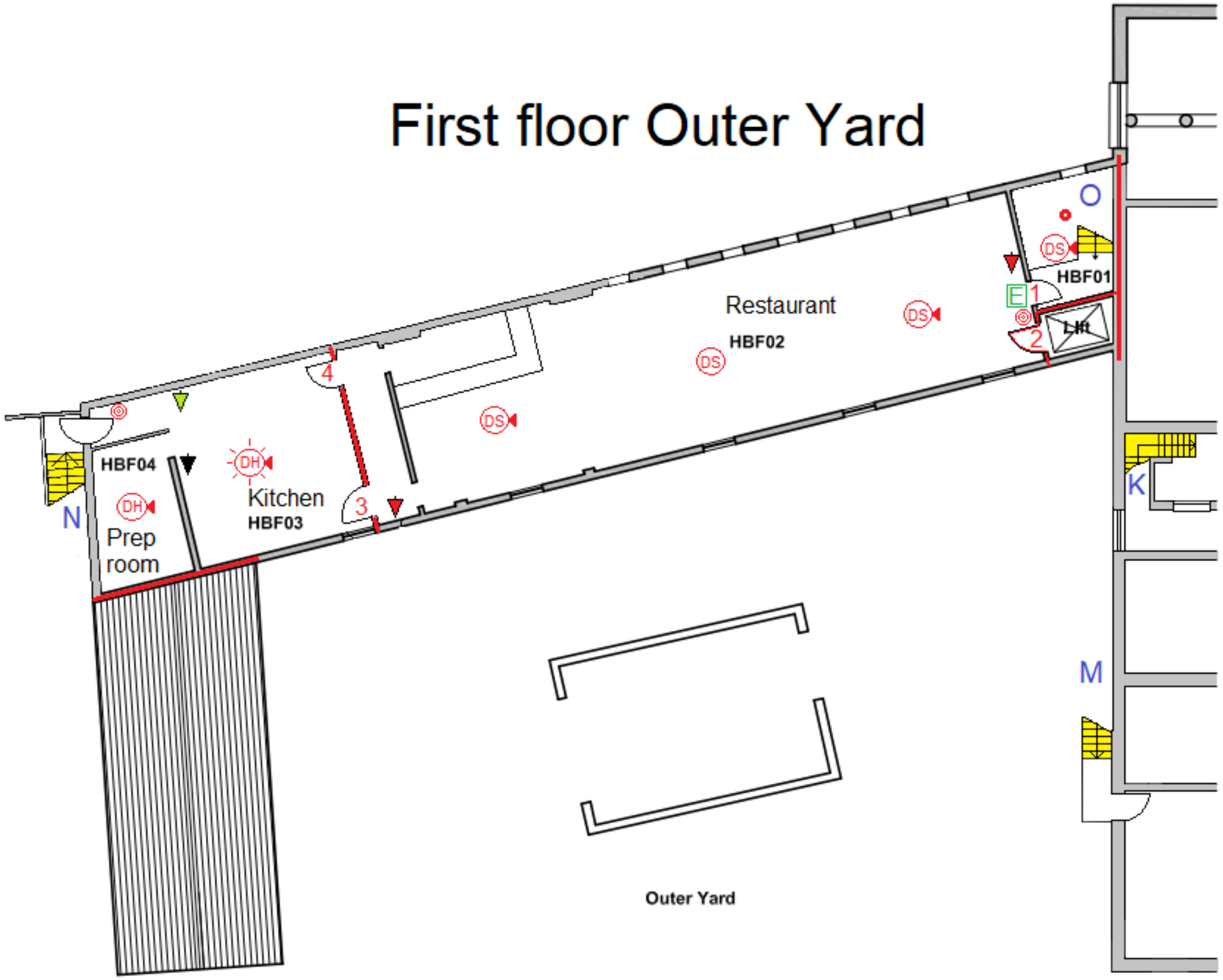


Key Plan

Scale 1:1250

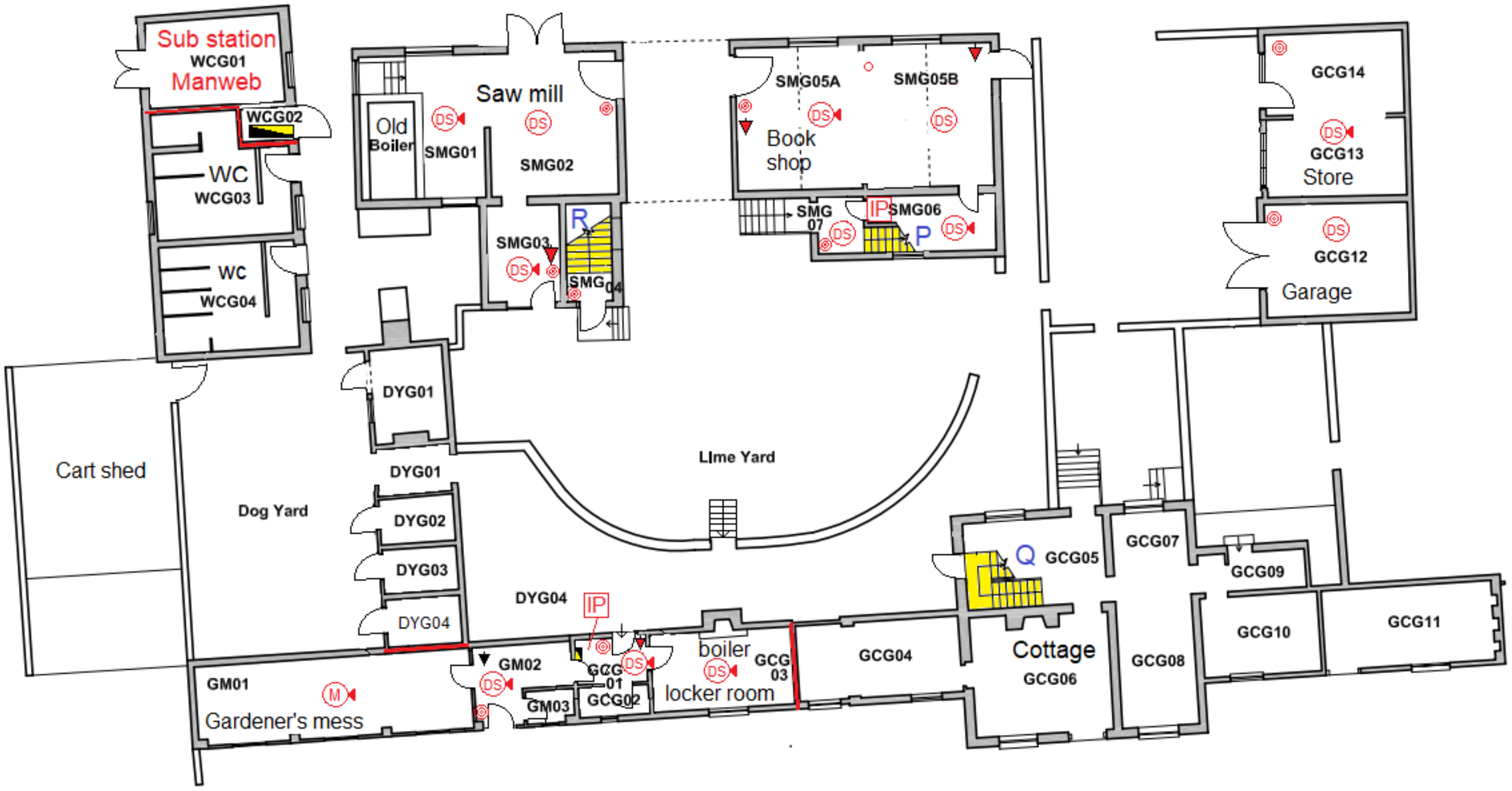
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First floor Outer Yard



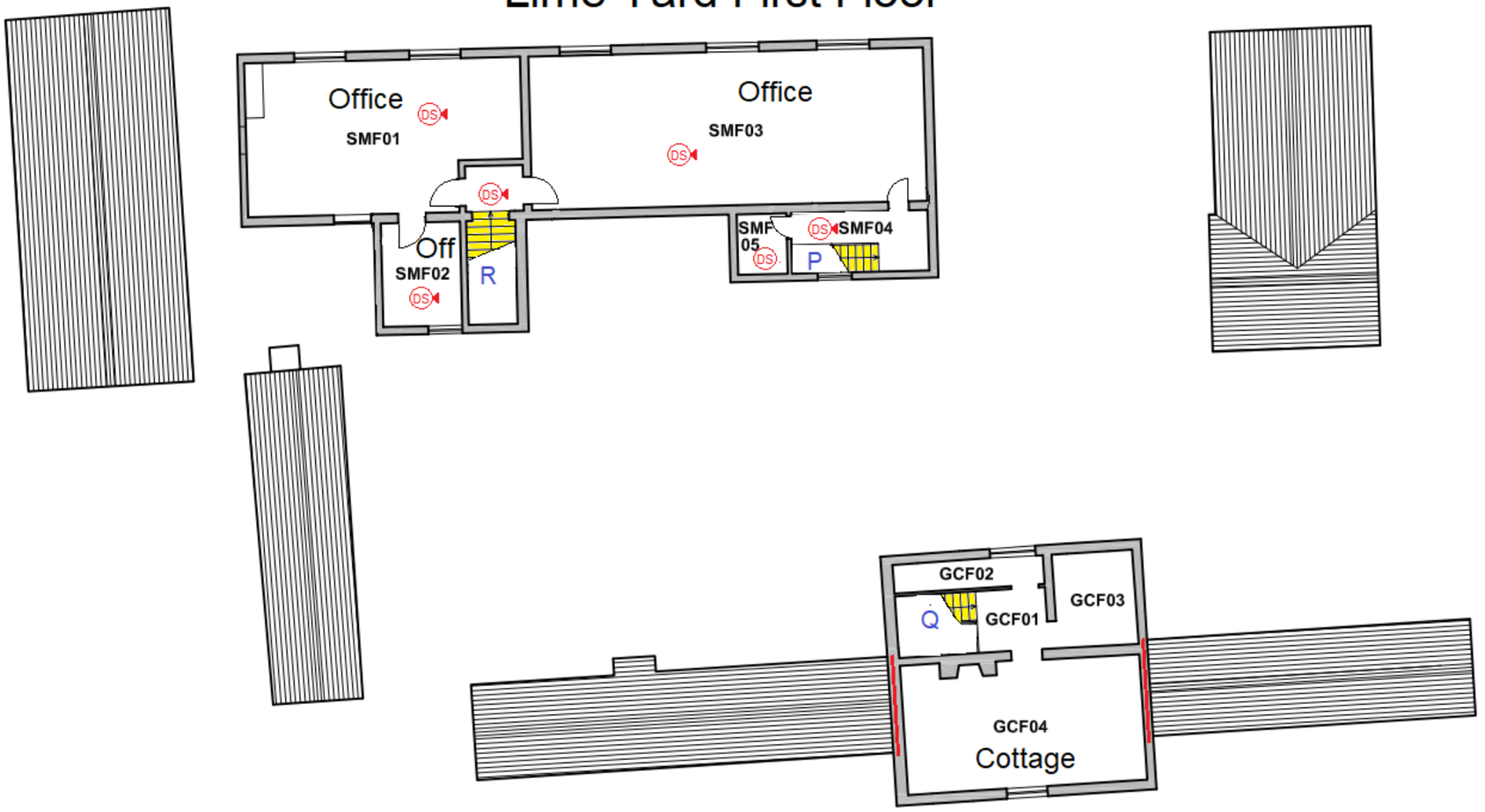
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Lime Yard Ground Floor



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Lime Yard First Floor



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