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P2001647 – Brighton and Sussex University NHS Trust  
Brighton 3Ts

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Section 3.1.9 Fire Strategy Review Early Works

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## Technical Note



<b>Project:</b>	Brighton 3Ts	<b>Date:</b>	6 August 2014
<b>Client:</b>	BDP	<b>Author:</b>	John Barnfield
<b>Ref:</b>	TS14236-N01-ISSUE 1	<b>Checked by:</b>	Russell Clinton
<b>Re:</b>	Potential impacts of new HTM guidance		

### Introduction

This Technical Note presents a summary of our preliminary fire safety review of the proposals for Brighton 3Ts, hospital in terms of the potential impact of changes that have been made to fire safety guidance presented in NHS Health Technical memoranda (HTMs).

#### HTM 05-02

The primary guidance on fire safety in hospitals is presented in HTM 05-02.

When the original fire safety strategy was developed in 2011, the 2007 version of HTM 05-02 would have been applicable. However, in April 2014 a new version of HTM 05-02 was introduced and the application of the new document could have a significant impact on the cost of fire safety provisions.

The headline issues arising from the introduction of the 2014 guidance that are apparent from a preliminary review of the scheme are summarised in Table 1.

#### HTM 05-03

Guidance that is supplementary to HTM 50-02 is presented in the HTM 05-03 series of documents. A number of these documents were updated towards the end of 23 September 2011 e.g.:

HTM 05-03A	Fire safety (Primarily fire safety management)
HTM 05-03D	Commercial enterprises
HTM 05-03F	Arson prevention
HTM 05-03H	Reducing false alarms
HTM 05-03K	Fire risk assessments
HTM 05-03M	Atria

Draft C of the fire strategy was issued on 5 October 2011 but does not appear to refer to the updated HTM 05-03 documents.

The changes introduced into the 2011 versions of HTM 05-03 parts D and M may impact on the atrium designs and any commercial enterprises (i.e. shops, cafes, etc.) within the buildings. However, the specific impacts would need to be the subject of a detailed review.

The changes to the other parts of HTM 05-03 would not be expected to have any significant impact on the fire strategy in its current state of development.

## Non-compliances

Table 1 summarises new significant items of non-compliance that arise from the introduction of the 2014 version of HTM 05-02. The list is not necessarily complete and other items may be identified following a detailed review of the design proposals.

**Table 1 – Non-compliances arising from introduction of 2014 version of HTM 05-02.**

Item and HTM 05-02 reference	Change to guidance	Comments
<b>Sprinkler protection</b>		
Table 5	Table 5 now states that healthcare buildings greater than 30m height are “not permitted” unless fully sprinkler protected (BS 12845 life safety system).	Compliance would require extension of sprinkler protection throughout all parts of the Stage 1 building.
<b>Escape lighting</b>		
3.79	Emergency escape lighting in accordance with BS 5266 is now specified to all areas in addition to hospital’s emergency lighting.	Section 22.1 of the October 2011 fire strategy states that emergency escape lighting is not required (i.e. consistent with 2007 version of the HTM).
<b>Motorised Fire and smoke dampers</b>		
Table 7	Motorised fire and smoke dampers are required to sub-compartment walls.	Previously thermally activated dampers were acceptable in sub-compartment walls.
<b>Escape bed lifts</b>		
3.49	Departments providing facilities for very high dependency or bariatric patients should have access to at least two remotely located escape bed lifts (HTM 05-03E).	This may require uprating of the specification of some lifts.
<b>Fire-fighting hose-lay distances</b>		
Table 11	All points within the building should be accessible within 45m of a route suitable for laying fire-fighting hose or 60m if the building is fully sprinkler protected.	The fire strategy (section 18) refers to a 60m hose lay distance. If full sprinkler protection is not provided additional dry riser outlets (and possibly additional stairs) would be required.
<b>Other items</b>		
3.73	Sub-compartmentation of plant rooms is recommended to separate essential services and plant serving very high dependency facilities.	This may impact on plant and equipment layouts.

Table 6	Free swing devices to relatives overnight rooms, ward kitchens etc.	Previously self-closing devices were acceptable.
5.62	Cavity barriers required to sub-divide cavities (e.g. ceiling voids) at 20m intervals.	Previously only ceiling voids exceeding 400m <sup>2</sup> required the provision of cavity barriers (i.e. distance between barriers could exceed 20m).

## Conclusions

Implementation of the 2014 edition of HTM 05-02 could have a number of significant design and cost impacts including those highlighted above. The following items appear to be the most significant.

- Full sprinkler protection to Stage 1 building.
- Motorised fire and smoke dampers in sub-compartment walls.
- Provision of emergency escape lighting.
- 45m fire-fighting hose-lay distance if the buildings are not fully sprinkler protected.

The approach to be adopted will need discussion and agreement with the Trust and approvals bodies but the options for dealing with the new HTMs appear to be:

- Compliance with updated documents.
- Establish agreement to the continuing adoption of 2007 document.
- Adopt the new HTMs and address any new derogations required on a case by case basis.

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# Technical Note



**Project:** Brighton 3Ts  
**Client:** BDP  
**Ref:** TS14236-N02-ISSUE 2  
**Re:** Helipad - fire safety review

**Date:** 28 August 2014  
**Author:** J Barnfield  
**Checked by:** S Hibberd

## Introduction

This Technical Note presents a summary of our preliminary fire safety review of the proposed helipad that is to be located on top of the existing Thomas Kent Tower building of the Brighton and Sussex University Hospitals Trust.

The review considers compliance with statutory (life safety) requirements and NHS guidance: primarily HTM 05-02 (Fire safety in the design of healthcare premises) and HBN 15-03 (Hospital helipads).

The review is intended to cover items that may have a major impact on cost or the architectural arrangement. Detailed aspects of design, such as the direction of door swings etc. have not been addressed at this stage.

We understand that the helipad is required to accommodate helicopters in excess of 15m in length but not exceeding 24m (i.e. category H2). It has been assumed that no helicopter refuelling or maintenance facilities are to be provided.

The main variations from guidance that have been identified are presented in Table 1 and the key design risks that have been identified are summarised below:

- ▶ The existing stairs from level 15m may not be suitable for stretcher evacuation.
- ▶ The unenclosed external stairs and escape routes are contrary to HTM guidance.
- ▶ Exit ramps have a gradient of 1:12 rather than the recommended 1:20.

Non-compliance with standard guidance will continue to represent a design risk until any necessary derogations are agreed with the Trust and approvals bodies.

Table 2 summarises the main fire safety measures that are likely to be necessary to achieve compliance with HTM requirements. However, these items should be treated as indicative only until the fire safety strategy has been fully developed.

## Non-compliances

Table 1 summarises the significant items of non-compliances with HTM 05-02 and HBN 15-03 identified from a preliminary review of the proposals. The list is not necessarily complete and other items may be identified during the development of the detailed fire safety strategy.

**Table 1 – Variations from standard guidance**

Item	Conflict with guidance	Comments
<b>Provisions for escape</b>		
HTM 05-02 precludes the use of external stairs and open roofs for patient escape. HTM 15-03 recommends that patients should be protected “as far as possible” from adverse weather conditions.	The current proposals rely on open stairs to traverse multiple levels (circa 15m) and the open roof to give access to protected escape stairs.	In adverse weather conditions (e.g. ice and snow) the use of exposed escape routes could be challenging. However, the escape routes will be used very rarely and generally for a single patient only. The suitability of the external escape routes and potential need for weather protection should be reviewed.
All stairs should be suitable for stretcher evacuation (e.g. sized for mattress evacuation)	The existing stairs from level 15 downwards are not sized for mattress evacuation. The proposed northern stairs between level 15 and level 16 are not sized for mattress evacuation.	All new stairs and ramps should be sized for mattress/stretcher evacuation (assisted patient evacuation and restricted ambulant passing). It is recommended that a trial be carried out to confirm whether or not stretcher evacuation is feasible via the existing protected stairs at level 15.
HTM 15-03 recommends that all ramps should have a maximum gradient of 1:20.	The proposed ramps off the helipad to the lift will have a gradient of 1:12.	The impact of the increased gradient should be reviewed and agreed with Trust. Options such as speed limited trolleys should be considered.
Risk of lift failure at critical time to be assessed.	It is not known if the new Trauma Lift is designed as an escape lift.	Designing the patient lift as an escape bed lift in accordance with HTM 05-03E should significantly mitigate concerns regarding lack of weather protection to escape routes.
<b>Fire service facilities</b>		
The helipad is not a normally occupied floor and therefore the extension of fire-fighting shafts above level 14 should not be necessary for statutory compliance.	Extension of fire-fighting shafts might be requested by fire service.	It should be confirmed that fire service will not request fire-fighting shafts up to helipad level.

Item	Conflict with guidance	Comments
<b>Structural fire protection</b>		
Elements of structure should be designed to achieve 120 minutes fire resistance.	New structural elements supporting the helipad will not be provided with fire protection.	Where the new structure may be subject to significant fire attack localised fire protection should be provided or potential risk areas (e.g. helipad staff room) should be enclosed in fire resisting construction.

## Fire safety measures

Table 2 summarises the main fire safety measures that are likely to be necessary to achieve compliance with statutory and HTM requirements. However, these items should be treated as indicative only until the fire safety strategy has been fully developed.

**Table 1 – Main fire safety measures**

	Fire safety provision	Comments
1	Helipad to have two access points on opposite sides. Preferably two ramps but one ramp and a stair is acceptable.	Ramp and stair provided. See also table 1.
2	Ramps should be 1:20 or flatter if possible.	See table 1.
3	Landings 1m below helipad level should be provided for fire-fighting purposes.	Landings provided
4	Two foam jets. One on each fire-fighting landing capable of supplying 500l/min for 10min.	Provided
5	Portable fire-fighting equipment. 45kg compatible dry powder, 18kg CO <sub>2</sub> .	Provided
6	Three trained RFFS personnel with full protective equipment.	
7	Rescue equipment including bolt cutters, axe, power saw etc. as recommended in paragraph 5.25 of HTM 05-13. Medical equipment pack.	Weatherproof store provided.
8	Facilities for fuel and fire-fighting run-off. Pipework fire protected where passing through the building.	
9	Internal spaces such as RFFS accommodation, lifts, plant-rooms etc. to be provided with fire safety provisions (e.g. detection, alarm, hazard room enclosure as per HTM 05-02 or at least no worse than in existing TKT building.	
10	All escape routes to be provided with suitable signage (BS 5499) and escape lighting (BS 5266).	

	Fire safety provision	Comments
11	Qualitative design Review (QDR) involving designers, approvals bodies and Trust now required by 2014 version of HTM 05-02.	May be an effective forum to review and achieve agreement to derogations highlighted in table 1.

## Conclusions

The proposals contain a number of significant non-compliances with standard guidance and it is therefore recommended that the options for resolving these be reviewed with the design team and approvals bodies at the earliest opportunity.

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# Technical Note



<b>Project:</b>	Brighton 3Ts	<b>Date:</b>	29 August 2014
<b>Client:</b>	BDP	<b>Author:</b>	J Barnfield
<b>Ref:</b>	TS14236-N03-ISSUE 1A	<b>Checked by:</b>	S Hibberd
<b>Re:</b>	Energy Centre - Fire safety review		

## Introduction

This Technical Note presents a summary of our preliminary fire safety review of the proposed amendments to the existing energy centre that is located below the A&E and pathology facilities of the Brighton and Sussex University Hospitals Trust.

The review considers compliance with statutory (life safety) requirements and NHS guidance: primarily the 2014 edition of HTM 05-02 (Fire safety in the design of healthcare premises).

The review is intended to cover items that may have a major impact on cost or the architectural arrangement. Detailed aspects of design, such as the direction of door swings etc. have not been addressed at this stage.

We understand that the existing energy centre and oil storage facilities are being remodelled to include new CHP plant and associated transformers.

The main variations from guidance that have been identified are presented in Table 1. In a number of respects the building is not consistent with current HTM guidance. However, subject to providing adequate means of escape and fire separation the proposed changes should be consistent with Building Regulations (i.e. the level of fire safety should be made no worse than existing).

However, it should be established whether the Trust wish to bring the existing facilities up to current standards. This would require additional fire safety measures such as the installation of an automatic suppression system.

The drawing mark-ups appended to this note indicate the suggested compartmentation and escape route provision to achieve statutory compliance.

Table 2 summarises the main fire safety measures that are likely to be necessary to achieve compliance with HTM requirements. However, these items should be treated as indicative until the fire safety strategy has been fully developed.

## Non-compliances

Table 1 summarises the significant items of non-compliances with HTM 05-02 identified from a preliminary review of the proposals. The list is not necessarily complete and other items may be identified during the development of the detailed fire safety strategy.

**Table 1 – Non-compliances with standard guidance**

Provision	Conflict with guidance	Comments
<b>Means of warning and escape</b>		
The maximum travel distance in a plant-room should not exceed 25 m or 12m in a dead end. (Extended to 35m and 25m for low risk plant e.g. AHUs). Escape routes to be minimum 2m clear height.	Dead end travel distance from CHP transformer room exceeds 12m.  Two escape routes are required from the mezzanine.	Provide alternative clear escape route through CHP as indicated on attached sketch.  Provide second route off mezzanine as indicated on attached sketch.
Escape stairs should be enclosed in fire resisting construction and discharge to outside.	Open stairs and ladder from boiler room mezzanine do not meet this recommendation.	Travel distances are within guidance and the mezzanine is assumed to have only a low and occasional occupancy. An open stair and ladder is therefore considered acceptable subject to agreement with approvals bodies.
<b>Internal fire spread (structure)</b>		
Table 1 of HTM 05-02 precludes locating the main boilers and high risk plant adjacent to very high dependency patient accommodation.  Automatic suppression is recommended if such plant is located adjacent to normal dependency patient accommodation.	It is understood that that auto suppression is not provided to the energy centre.	As the energy centre is existing there is no requirement under Building Regulations to meet current guidance. The uses of the adjacent accommodation (horizontally and vertically) should be confirmed. If there is no existing auto-suppression system it should be established whether the Trust wish to upgrade to, more closely, meet current standards. If there is an existing suppression system a similar level of protection should be maintained.
New recommendation of 2014 edition of HTM 05-02. Plant rooms to be sub-compartmented to separate essential services (e.g. power and ventilation serving very high dependency areas).	It is not known if this provision is applicable to the Energy Centre.	Review relevance and if relevant establish whether Trust wish to implement this provision.

Provision	Conflict with guidance	Comments
Motorised fire and smoke dampers should be provided in all compartment and sub-compartment walls.	It is not known what type of fire dampers are currently installed in fire resisting construction or their current state of maintenance.	Review existing installations and establish whether upgrading of existing dampers and fire stopping etc. is appropriate.
<b>External fire spread</b>		
External walls may need to be fire resisting to prevent fire spread from building to building.	The location of new 3Ts building places a potential restriction on unprotected areas to the external wall of boiler plant room.	The provision of a fire resisting wall (60 min) between boilers and CHP plant as shown on attached sketch should remove any restrictions on external wall.

## Fire safety measures

Table 2 summarises the main fire safety measures that are likely to be necessary to achieve compliance with statutory and HTM requirements. However, these items should be treated as indicative only until the fire safety strategy has been fully developed.

**Table 2 – Main fire safety measures**

	Fire safety provision	Comments
1	Travel distances to be maximum of 12m (25m in low risk areas) in dead ends and 25m where escape is available in two directions.	See table 1
2	Fire alarm and detection to be installed in accordance with HTM 05-03B and BS 5839: Part 1 (L1).	
3	All escape stairs should be enclosed in fire resisting construction.	Open stair proposed - see table 1.
4	Escape lighting to BS 5266	
5	Fire safety signage to BS 5499	
6	New elements of structure to provide 120 minutes fire resistance (or equal to existing building if lower rating).	Fire resistance of existing building structure to be established.
7	Fire stopping of service penetrations to have same fire resistance as separating element.	Condition of existing fire stopping should be established.

	Fire safety provision	Comments
8	Fire & smoke dampers in floors and walls to be operated by activation of fire and smoke detection and thermal release.	New fire dampers should be motorised fire and smoke dampers. Nature and state of existing fire dampers should be established (see table 1).
9	Automatic fire suppression is specified in HTM 05-02 where main boilers and similar plant is located adjacent to patient accommodation.	See table 1
10	Space separation requirements determined using methods in BRE report BR 187.	No restrictions anticipated if boiler and CHP rooms are fire separated.
11	Fire hydrant to be available within 90m of entrance to Energy Centre.	Location of fire hydrants to be confirmed.
12	Fire tender access to be available to 15% of building perimeter.	Access available via service road.

## Conclusions

Subject to the compartmentation and escape provisions highlighted in this note the energy centre would be expected to meet the requirements of the Building Regulations and Regulatory Reform (Fire Safety) Order 2005.

There are potential non-compliances with current HTM guidance and it should be established whether the Trust wish to upgrade the fire safety provisions to more closely meet current HTM guidance.

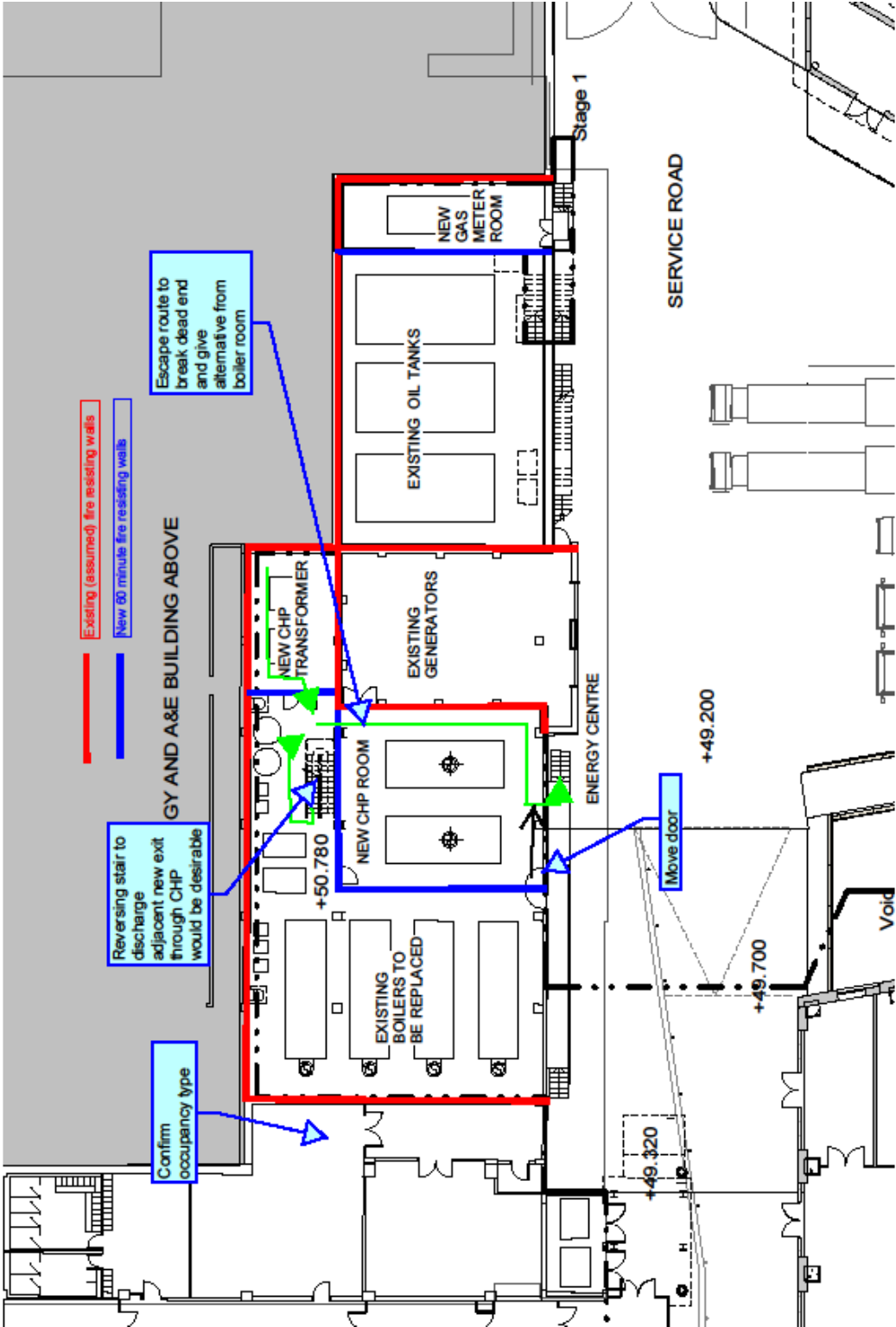
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Level 3 (Ground)



Level 4 (Mezzanine)

