Fire Safety Strategy for DAS

Project Title	UCL Bicentennial Project – Main Quad and Wilkins Building
Client	Gardiner & Theobald LLP
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Bureau Veritas have been engaged to provide a fire safety strategy for the UCL Bicentennial Project involving different proposed works:

- Remodelling of the Main Quad
- Refurbishment of Wilkins Cloisters and adjacent rooms
- Possible pedestrianisation of Gordon Street

1 Main Quad

The Main Quad is an outdoor space and therefore it sits outside the scope of the Building Regulations 2010. However, it is noted the Main Quad plays a crucial part in the current Fire Vehicle Access to the UCL Buildings surrounding it. This report will only focus on assessing how the proposal affects the access and facilities for the fire service which is the only aspect of the Building Regulations 2010 impacted by the Main Quad remodelling.

Everything related to the increased number of people attending an event in the Main Quad and their evacuation falls outside the scope of the Building Regulations and this report, as it is an outdoor space. This will need to be assessed by a specialist contractor dealing with crowd management during events, potentially with the aid of a software simulating evacuation models for a large number of people in this type of circumstances, and in line with UCL Fire/Building Management Team expectations.

Currently the buildings surrounding the Main Quad are not provided with fire mains. For this approach, ADB Vol.2 requires fire vehicle access in line with the Table below:

Table 15.1 Fire and rescue service vehicle access to buildings not fitted with fire mains

Total floor area[1] of building (m²)	Height of floor of top storey above ground (m)[2]	Provide vehicle access to:	Type of appliance
Up to 2000	Up to 11 Over 11	See paragraph 15.1 15% of perimeter	Pump High reach
2000–8000	Up to 11 Over 11	15% of perimeter 50% of perimeter	Pump High reach
8000–16,000	Up to 11 Over 11	50% of perimeter 50% of perimeter	Pump High reach
16,000–24,000	Up to 11 Over 11	75% of perimeter 75% of perimeter	Pump High reach
Over 24,000	Up to 11 Over 11	100% of perimeter 100% of perimeter	Pump High reach

NOTES:

1. The sum of the area of all storeys in the building (excluding basements).
2. For storage buildings (purpose group 7(a)), measure height to mean roof level (see Appendix D).

Looking at the provided sections by the architects, the buildings around the Main Quad do not have a top occupied storey exceeding 11m in height, apart from the Northwest Wing and Chadwick Building in proximity of the main gate entrance to the Main Quad.

Therefore, as per client's request, a high reach appliance is recommended, which would also provide more cover in case of roof fires around the Main Quad. Please see below access route parameters for high reach appliances to be met.

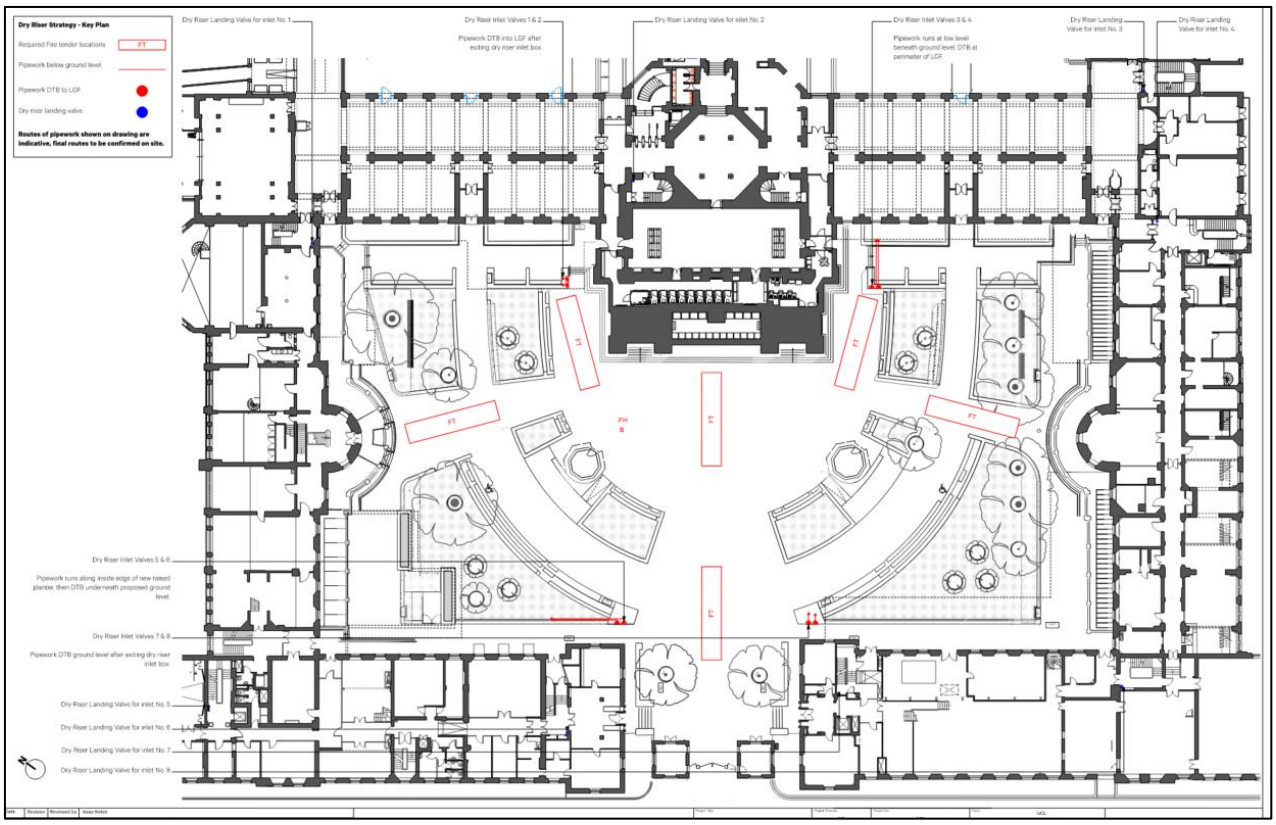
Appliance type	Min. width of road between kerbs	Min. Width of gateways	Min. Clearance height	Min. Carrying capacity	Min. Turning circle	
					Between kerbs	Between walls
High Reach	3.7m	3.1m	4.0m	17.0 tonnes	26.0m	29.0

The firefighting access strategy of the UCL Buildings around the Main Quad has always relied upon perimeter access, which is confirmed by no fire mains currently provided.

ADB Vol.2 requires a percentage of the perimeter of buildings not provided with fire mains to be accessible to firefighters based on the sum of the area of all storeys in the building and their height of floor of the top storey above ground, as shown in the previous table.

No information has been issued to Bureau Veritas on how the existing firefighting access strategy has been designed, if it considers each UCL building individually, if it takes into account the total perimeter of each UCL building, etc.

However, providing that the redesign of the Main Quad does not affect negatively the existing Fire Vehicle access to the surrounding buildings, the proposed scope of work is not deemed to worsen the existing condition. See below proposed Fire Vehicle locations following a Fire Vehicle Swept Path Analysis performed by the Design Team which is in line with the existing approach.



There is a proposed installation of dry risers to provide additional hose coverage inside the surrounding buildings. However, based on the above paragraphs, the dry risers' provision is voluntary as not part of the existing firefighting access strategy.

Fire mains should be designed and installed in accordance with BS9990. ADB states access should be provided for the Fire Vehicle to within 18m of each fire main inlet connection point. Inlets should be on the face of the building and the fire main inlet connection point should be visible from the parking position of the appliance. Each fire hydrant should be clearly indicated by a plate, fixed nearby in a conspicuous position, in accordance with BS 3251.

Fire tender access is shown within 18m of the proposed dry riser inlet connection points but these are currently not located on the buildings façades.

Dead-end fire service access roads may be up to 20 metres long without being provided with a turning bay (**A fire service vehicle should not have to reverse further than 20m**).

Fire appliances are not standardised. The building control body may, in consultation with the local fire and rescue service, use other dimensions.

The roadbase can be designed to 12.5 tonne capacity. Structures such as bridges should have the full 17-tonne capacity. The weight of high reach appliances is distributed over a number of axles, so infrequent use of a route designed to accommodate 12.5 tonnes should not cause damage.

The remodelling of the Main Quad for hosting public events must consider that this space needs to be available for Fire Service intervention and therefore a strong management should be in place ensuring the large number of persons and eventual temporary structure located in the space for events purposes do not cause any impediments to the firefighting operations for a fire happening in the surrounding buildings. This should be reviewed and agreed by the approval authorities.

The dry risers are proposed to be provided with an inlet valve positioned externally and internal landing valves should be provided at each floor level, including the ground level, in the stair enclosures. However the new dry risers inlets proposed into the landscape will currently only extend to Ground Floor. The approach consists in running the dry riser pipes into the buildings at basement level, route them to the required locations at lower ground floor level and then rise to above and stop the pipework at ground floor level where outlets are present.

BS9990 recommends that any run of connecting pipe between the inlet and the run of the main should be kept to a minimum (no greater than 18m) and should be given a fall towards the drain valve.

Bearing in mind these are listed buildings with low design flexibility, the proposed dry riser strategy is technically not fully complaint with current Guidance for various reasons:

- The dry riser inlets are not located on the buildings' elevations;
- The dry riser outlets should be located within protected (enclosed in fire rated construction) stairs at each floor level and this is currently proposed only at Ground Floor;
- The hose coverage limit from a dry riser outlet to the furthest point of the internal floor area cannot exceed 45m (assuming no firefighting shafts are provided in the buildings). This has not been assessed by Bureau Veritas due to lack of information provided;
- Any run of connecting pipe between the inlet and the run of the main should be kept to a minimum (no greater than 18m) and should be given a fall towards the drain valve and this is not currently achieved.

The proposed dry risers' provision is not required for Building Regulations purposes as the existing firefighting access strategy is not changing within the proposed scope of work.

However, if a voluntary provision of dry risers is required by the client, currently the design does not achieve full compliance and represent an approval risk to be reviewed and approved by Building Control and the LFB.

Confirmation is required in regard to existing fire hydrant provision on site. If an existing fire hydrant is located not more than 100m from the dry riser inlets, additional fire hydrants will not be required.

If an existing hydrant is not provided within 100m of the dry riser inlets, then a new fire hydrant should be provided within 90m of the dry riser inlet points in accordance with BS9990.

Each hydrant should be clearly identified by a plate and fixed in accordance with the recommendations of BS3251.

The UCL Fire Safety Team has highlighted an existing hydrant is present roughly in the middle of the Main Quad and that this should be retained and accessible at all times.

2 Wilkins Building

The Wilkins Building is considered an educational establishment and therefore this fire strategy has been developed on the basis that the premises fall into Purpose Group 5 – Assembly and Recreation.

Within the areas of the Wilkins Building subject to the refurbishment works, the evacuation strategy is assumed to be based on a simultaneous evacuation strategy, where all occupants will escape at the same time upon detection of fire.

Current occupancy figures have not been provided to Bureau Veritas. However the nature of the refurbishment works is not deemed to increase the number of people present in the premises covered by this report. Therefore no updated means of escape sizing analysis has been deemed necessary to be carried out, as long as the current situation is not worsened by the proposed refurbishment.

For travel distance, the refurbishment works involves demolition of existing partitions at both basement and ground level, merging two existing stairs into an open one discharging at ground level into the building. Removing one storey exit at basement could be considered a worsening condition in terms of travel distances, however the existing two stairs to be removed are assumed not to be included in the currently available means of escape dedicated to the basement occupancy. This is because one stair appears to be an accommodation stair dedicated to the existing dining areas and the other discharges in an open manner at ground level without any fire rated enclosure. These existing escape routes would not be compliant escape routes under current Guidance and therefore the proposed works are not deemed to worsen the existing arrangement.

Similarly for vertical means of escape, the proposed alterations will remove two stairs at basement level, creating a new open accommodation stair discharging at ground floor. This is not deemed a worsening condition, as the existing stairs now removed are not acceptable escape routes in line with current Guidance and they should not be counted as available means of escape in any configuration. It is noted currently both existing stairs to be removed are not discharging in compliance with Guidance at Ground Floor. This is because one stair discharges into a dining room and the other has no door, making this an open stair which is already an unacceptable means of escape. It is recommended building management ensures storage of fire load does not happen under the new proposed.

No impact is assumed on the current available means of escape arrangement for disabled occupants. However the inclusion of a platform lift within the new stair core is deemed an improvement to the overall accessibility of the building.

Fire detection and alarm will be a minimum a Type ‘M’ standard of fire detection and alarm system to BS5839-1 should be provided.

It is assumed no automatic fire suppression system covers the premises.

Any altered elements of structure essential for maintaining the stability of the building shall be afforded a minimum of 60 minutes load-bearing capacity.

No alterations to the existing external walls are assumed to be included in the proposed refurbishment works.

The proposed works within the Wilkins Building also do not have any impact on the current firefighting access strategy requiring no further comment.