



## Document Control

Rev	Date	By	Comments
E	Mar 20	J Thrupp	Update
F	Feb 21	UoL	Interface Updates
G	Sept 21	UoL	Void Clarification update
H	19 Sept 21	UoL	Life Cycle analysis Added
I	7 Oct 22	UoL	VADS and mounting locations information updated
J	24 Oct 22	UoL	Minor Alterations

## Design Guidance

- The central alarm receiving centre (ARC) for all projects whether new development, full or part refurbishment shall be the University central campus security where all fire and fault activations shall report in the first instance. Signalling shall be via a dedicated network outlet for signalling only. The fully addressable fire alarm panel shall operate over the Drax network.
- The fire alarm classification for all Academic buildings shall be to a minimum L2 classification and L1 for all Residential buildings.
  - The additional areas for L2 definition should include, as a minimum, the following areas such as kitchens, electrical distribution rooms, store areas if not fire resistant or where escape of smoke can occur, plantrooms, boiler rooms and similar high risk areas.
- Minimisation of nuisance alarms shall form an integral part of the design stage of any fire alarm system. Where specific areas present the risk of nuisance alarms, consideration shall be given to the use of specialist automatic detection methods. The specification of any such system shall be agreed with the University fire officer and maintenance team prior to specification.
- It is the university's preference to operate a 1 out all out policy. No phased evacuation philosophy shall be adopted without consultation of the University fire officer during design stage.
- Design cause and effect schedules shall be provided by the designers (in accordance with the Building Safety Act) for University agreement at least 1 month prior to commissioning in order to assess the final fire strategy of the building including room and device reference addressing.
  - The designers shall be responsible for the coordination of the schedule between all parties including input from the fire alarm system installers.
  - The cause and effect shall include for all necessary interfaces and consider shutdowns and/or operation philosophy changes of the following as a minimum
    - CHP engines
    - Boilers
    - Gas valves/Medem units
    - Air handling systems
    - Safety Circuits
    - BMS operations
- The treatment of fire detection in ceiling voids 800mm and above shall be given careful consideration as detailed in the following clauses and as follows.
  - The University do not wish to un-necessarily install void detection where risk is shown to be low and this is explained in the following main paragraph.
  - If void detection is required it can be expensive to maintain and expensive to undertake compliance checks. The University therefore require void detection to be analysed on a whole life cost basis taking into consideration the capital installation cost and the life cycle maintenance and compliance costs.
  - The fire alarm designers will therefore be required to analyse the requirements of void detection and



in all instances, where this is extensive requiring several detectors, look at the possible cost benefits of an alternative Aspirating solution(s). This analysis work shall be undertaken at RIBA stage 3 latest and the options presented to the University who will then give guidance as to which type of system to include for tender issue.

7. The treatment of ceiling voids greater than 800mm in accordance with BS5839:1 shall be risk assessed and discussed with the Fire System designer and the Fire Officer. However the University would normally expect to see void detection determined as follows
8. Void detection shall be included within all voids above escape routes where they are 800mm deep or greater.
9. Void detection shall be included within all voids above rooms adjacent to escape routes where such rooms do not have a fire resisting construction to the escape route and the voids are 800mm deep or greater.
10. Void detection shall be included within any voids containing fan coils, heat recovery units, motors, other sources of combustion or the like where they are 800mm deep or greater.
11. Detection is not needed in voids 800mm or greater above other rooms, not included in the above, where the voids are without any sources of combustion, i.e. only containing lights and cables.
12. Void detection shall not be installed un-necessarily where the risk is identified as being low.
13. In areas where a large number of detectors would be required due to beams and other obstructions then other detection systems should be considered such as Aspirating (FAAST/VESDA) units. See previously.
14. Fire alarm audibility shall be achieved using a voice annunciated system for all new developments. PA/VA shall not be implemented for this purpose and refurbishment projects shall be discussed with the university estates/ fire officer to decide whether the extent of refurbishment warrants a full replacement of voice annunciation or whether traditional sounders shall be utilised. Buildings shall not be left with a mix of system audibility types.
15. Electromagnetic door hold open devices shall be installed to all circulation routes where doors do not open directly into a protected stairwell or refuge area. Door sensor alarms shall be installed to all residential kitchen doors to prevent from being left open.
16. Multifunctional devices shall be used in all cases where sound/ speech & strobe functions are required in lieu of separate devices.
17. All university fire alarm panels shall be linked via the Drax AMX network, preferably hard wired and at least dual path with signal redundancy, currently provided around campus. Allowance shall be made in all system designs to network the Fire alarm control panels via the SMaRT Watch and SMaRT Cube interfaces via RS232 port connections. Where required allowance shall be made to provide RS232 ports to existing panels to enable network management of the system being modified.
  - Any power supplies for the interlinks and signalling shall have a stand alone UPS backup providing at least as much time standby as for the fire alarm system itself.
  - If the backup power supplies fail they shall automatically provide an alarm.
18. Visual Alarm Devices (VAD's) shall be provided in all areas where it is deemed that a person may be alone within the building.
  - This shall include as a minimum all WC's, changing and shower facilities.
  - All rooms denoted as occupancy of three persons or below.
  - All lecture theatres, seminar rooms and teaching spaces.
  - In any rooms which are being provided with Audio Visual facilities.
  - Also in line with the limited number of University of Leicester Generic Room Data Sheet if these are stated as being required.
  - VAD installed density, floor area per beacon, must be within manufacturers installation data specifications.
  - The VAD devices must be installed full in accordance with the manufacturers requirements and recommendations. Wall devices must only be installed on walls and ceiling devices must only be installed on ceilings. They must be installed in accordance with the manufacturers installation certification.
  - The VAD cabling must also be installed fully in accordance with the manufacturers installation certification and recommendations. Wall mounted devices must be connected bottom entry only.



19. Fire alarm interface devices shall be provided to all systems as described later within this document. Where provided a key isolation 'test facility' shall be provided adjacent to the panel capable of isolating some devices from the general fire alarm periodic testing to minimise disruption to the building and occupants.
  - All interface devices shall have an easily readable site label detailing what the device does and the system it interlinks to. Text in plain simple English wording.
  - Multi channel interface devices shall have such plain wording for each such channel.
20. Refuge alarm systems must not form part of the combined WC toilet alarm system. These systems shall remain independent and monitored from the secure lobby and building reception respectively.
  - See the details within the separate design guide for Refuge Systems.
21. Fire alarm interface units shall be included within all projects for
  - Certain maglock and door interfaces. See Access Control design guide for further details.
  - AV systems in Lecture theatres and large teaching spaces. The fire interface unit shall disable all audio and all visual presentations in these spaces such that any fire alarm audio signals or fire alarm visual signals are correctly heard and seen by occupants.
  - The above item (b) must not impede any hard of hearing systems repeating fire alarm warnings.
  - Interlinks to building heating and ventilation systems. This shall be programmable building by building after design consultation but must always include gas systems.
22. Spare capacity for future extension or alterations
  - All containment for any loop wiring shall have a minimum 20% spare capacity for additional cables.
  - The loops themselves shall have spare capacity for an additional 20% devices on any individual loop.
  - The loops themselves shall have spare capacity for a 20% length extension
  - The loops themselves shall have 20% spare capacity for additional current draw
  - The panels and any cards shall have 20% spare capacity for 2 additional cards and/or loops
23. All general circuit wiring **must** be routed and contained within the floor area served by the respective circuit.
24. A document holder shall be provided for the fire brigade building documents. This to be a bright red "Leicestershire Fire brigade" A3 wall mounted, lockable holder. This to contain
  - Contact details of accountable persons.
  - As built building plans showing all fire related equipment.
  - Fire zones.
  - Cause and effect schedule.
25. A wall mounted building zone chart shall be provided alongside the main fire alarm panel in a glazed fixed frame. It shall be a minimum A3 size. All to be clearly coloured and easily read.

## Design Components

Item	Manufacturer	Comments
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Panels	Gent Vigilon	<p>All main fire alarm indicator panels and system devices shall be truly 'open/managed protocol' and shall include the provision of unlimited future software access and manufacturer support updates for specific use on UOL campus.</p> <p>Panels shall be modular in construction and allow for future expansion. RS232 interface card to be provided for off-site DRAX network monitoring.</p> <p>Control and indicating equipment shall be microprocessor based and operate under a multi-tasking software program. Operating programs and configuration data must be contained in easily updateable non-volatile memory. (EEPROM)</p> <p>It shall be possible for the engineer to perform configuration upgrades on site using the control panel or a handheld programmer. Necessary programming equipment and connection leads shall be provided at handover for the specific system specified.</p> <p>No more than 200 addressable input or output points shall be controlled by a single loop card.</p> <p>Main fire alarm indicating equipment shall be capable of indicating the following as a minimum:</p> <ul style="list-style-type: none"> <li>• Networkable</li> <li>• 1-6 loops</li> <li>• 32 zone minimum</li> <li>• Where there are more than 32 zones or where zones form part of a network system a mimic panel must be fitted at the main fire panel.</li> <li>• Power AC healthy</li> <li>• Common fire/ fault</li> <li>• System/ CPU fault</li> <li>• Charger &amp; Battery supply fault</li> <li>• 8 line 40-character alpha numeric display of Fire condition and location.</li> <li>• Minimum 30-character label per device</li> <li>• An interface unit for connection to a central receiving station with clean contact changeovers.</li> </ul> <p>A blue key switch should be utilised for isolation of Fire links to Security Control. This key switch control may also be used for local over-ride to key elements of plant within the respective building for testing purposes. Key to be captive with indicator to prevent inadvertently leaving in the isolated position and shall be clearly engraved.</p> <p>Repeat panels must be of a functional types.</p>
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Devices / Equipment	Gent Vigilon S-Quad	<p>All devices must be truly 'open/ managed protocol'.</p> <p>Solutions for High sensitivity areas shall include provision for an air aspiration system. Other detection types may be considered via approval.</p> <p>Particular care shall be taken to select appropriate devices for harsh environments – i.e. Cold Rooms.</p> <p>Carbon Monoxide detecting devices shall be utilised for all areas where CO may be present such as adjacent to domestic boilers or within bio solid fuel storage bins.</p>
Fire Alarm Interface Operations		<p>Door access devices shall all fail open unless the security requirements of the building dictates otherwise through consultation with the estates/ security department. All fire door holders shall release.</p> <p>All plant to be auto resetting after a fire condition and lifts shall be supplied with multichannel interfaces for alternative destination control should the fire detection be at ground floor level.</p> <p>The cause and effect shall include for all necessary interfaces and consider shutdowns and/or operation philosophy of operation of the following as a minimum</p> <ul style="list-style-type: none"> <li>• CHP engines</li> <li>• Boilers</li> <li>• Gas valves/Medem units</li> <li>• Air handling systems</li> <li>• Safety Circuits</li> <li>• BMS operations</li> </ul> <p>The mechanical control panel shall receive a series of fire alarm condition notifications via volt free contacts to indicate the zone in which the fire condition has been activated. The mechanical control panel shall correlate the fire alarm zone activation to the AHU/ chilled water circuit and shutdown the respective mechanical services ONLY within the area of alarm.</p> <p>Incoming services such as gas shall be shut down upon full activation of a fire alarm condition.</p>



Sounder devices		<p>The University of Leicester preference shall be to use loop powered sounders throughout the installation. Speech annunciated evacuation shall be implemented.</p> <p>Sounder devices shall be fully adjustable from 0-110dB.</p> <p>Where required to meet building regulations Pt M or to supplement sounder levels in areas with high ambient noise, VAD's shall be provided integral to the sounder device and shall be of the LED type.</p>
Electromagnetic door hold open devices	Briton 996	<p>Mounting application and finish to be discussed with the project team and agreed at design stage.</p> <p>Hold open devices shall not be used to doors directly onto the primary escape staircases.</p>
Aspiration systems	Gent FFAST Vesda Compact	<p>Air sampling fire sensing systems shall be employed in areas difficult to access, exceed recommended working height for conventional detectors and high-risk areas. Typical areas where air sampling systems shall be included are:</p> <ul style="list-style-type: none"> <li>• Atria spaces</li> <li>• Lift shafts</li> <li>• Primary Server rooms</li> </ul>
Wiring System	Delta Firetuf FP200 Gold	<p>Red sheath (may require to be screened in mini trunking/ conduit in surface applications).</p> <p>Where rising or inverted cables are installed these shall be secured by metallic fixings (no non metallic shall be used) tie wraps.</p> <p>Fire resisting cable to be tested to CWZ standards.</p>

### Framework Contractors

Service	Specialist	Address & Contact Details
Honeywell Gent	Gent 24 Approved Systems Integrator	<a href="https://www.gent.co.uk/gent24/locator/">https://www.gent.co.uk/gent24/locator/</a>