

THE GRENFELL TOWER INQUIRY

EXHIBIT JDE/8

This is the Exhibit marked “JDE/8”
referred to in the witness statement
of Jonathon David Earl

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GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

1: PROJECT OVERVIEW

The project is for a significant refurbishment of an existing residential 120 dwelling apartment block, for Kensington & Chelsea TMO, with the building remaining fully occupied throughout the duration of the works,

The lower 4 levels of the building referenced as grd, mezz, walkway and walkway 1 have been completely regenerated to provide 9 new apartments, a Boxing Gym, Day Nursery, Community Centre and open atrium entrance area.

Major mechanical upgrades include a new building wide communal heating system and a new automatic smoke extract & fire detection system.

With the exception of the introduction of new communal heat interface units and kitchen extract fans within each dwelling, no refurbishment works were undertaken within the existing apartments.

There was an extensive refurbishment of the existing apartment lift lobbies.

The existing door entry and access control systems have been upgraded and renewed.

Externally the entire building envelope has been re-clad and glazed. A new play area has been installed for the Day Nursery and the building perimeter landscaped.

The elements and extent of the electrical works undertaken on the project has been outlined in the following sections.

2: SUB-MAIN DISTRIBUTION

SCOPE OF WORKS	<p>To adapt the building's existing main and sub-main distribution system to accommodate the new Nursery, Boxing Club, Community Room and additional new apartments.</p> <p>Strip out any redundant sub-mains no longer required.</p> <p>The existing 3 no. main UKPN heads were to be retained and revised, main Landlord's switch fuse and busbar along with the following sub-mains:</p> <ul style="list-style-type: none">• Basement boiler and plant services distribution board• Roof top plant and tank room services distribution board• Distribution board serving core lift lobbies and stairs• 120 no. apartments <p>The following new sub-mains have been installed:</p> <ul style="list-style-type: none">• New nursery distribution board – metered• New boxing club distribution board – metered• New community room distribution boards – Landlords• New mechanical services distribution board – roof plant areas – Landlords• New external lighting distribution board <p>Additionally new primary & backup power supplies have been installed to serve the building's new auto smoke extract system.</p>
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GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

METHOD OF INSTALLATION	Generally sub-mains have been installed using LSF XLPE SWA cables routed either on steel galvanised cable trays or clipped directly to the building fabric.
LIFE SAFETY POWER SUPPLIES	<p>Grenfell Tower has an extensive forced smoke extract system which is qualified as a life safety service. Subsequently the system requires both primary and secondary protected power supplies.</p> <p>The primary supply is fed from the main Landlords distribution busbar located in the ground floor main switch room in Grenfell Tower.</p>
LIFE SAFETY POWER SUPPLIES	<p>The secondary or backup supply is fed from the adjacent Grenfell Walk building and can be accessed from Intake no. 7. On entering Grenfell Tower the supply is terminated to a dedicated distribution board located in the ground floor main hub room within the main Community centre.</p> <p>All life safety sub-main power supplies are installed using fire rated Pirelli FP600 SWA cable either fixed to galvanised cable tray or clipped directly to the building fabric.</p> <p>All life safety switchgear can be identified by dual supply warning labels affixed to each item of equipment.</p>

3: DAY NURSERY PREMISES

SCOPE OF WORKS	A complete new electrical installation has been carried out to serve the new ground floor Nursery area.
METHOD OF INSTALLATION	<p>The Nursery installation has been installed utilising BS7211 LSF multi core double insulated cabling on cable trays/ baskets, fully concealed within suspended ceiling voids and dry wall construction.</p> <p>Due to the inclusion of accessible lift out ceilings throughout, the installation can be considered fully rewirable for future services or alterations.</p>
LUMINAIRES:	Generally all lighting sources within the day nursery are high efficacy LED sources. All luminaires are connected to the hard wired installation via flexed plug-in ceiling rose units.
LIGHTING CONTROL:	Local wall mounted light switches to offices, play areas and WCs. PIR presence detectors to store rooms.
EMERGENCY LIGHTING:	Standalone 3 hour LED light modules within main play areas and emergency versions of standard light fitting within all other areas. Emergency testing via local key switches.

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SMALL POWER ACCESSORIES:	Small power accessories within the Day Nursery have been selected from the MK Electrics 'Logic Plus' ranges.
FIRE ALARM:	<p>The Day Nursery has an independent, addressable L2 fire detection and alarm system.</p> <p>The system is connected to the Landlord's Tunstall Telecom remote response facility to ensure the system is monitored out of hours.</p> <p>Method of Installation: Pirelli FP200 Plus fire alarm cabling clipped directly to the building structure, concealed within suspended ceiling voids and dry lined walls.</p>
MISCELLANEOUS ITEMS:	<p><u>Disabled WC alarm:</u></p> <p>The disabled / special needs WC has been fitted with a standalone distress alarm call system.</p> <p>The system has a pull cord activation within the WC cubicle, a flashing beacon/ sounder alarm outside the cubicle and additional alarm in the main office. The reset facility is located in the WC cubicle to ensure each call is actioned before the system can be silenced.</p> <p>Method of installation: 230V power supply cabled in BS7211 twin & earth cable to the main control unit, then 1308 multi-core security cable to pull cord, reset and sounder units.</p> <p><u>Extract fan boost</u></p> <p>The Nursery kitchen, WC and disabled WC have a mechanical extract ventilation (MEV) system installed.</p> <p>The MEV system is designed to 'trickle' continuously with a boost facility triggered by activation of the local light switches.</p> <p>The control circuit for the boost facility is a 230V circuit wired directly from the main MEV unit through a single pole of the double pole switches used to switch the general room lighting. This differs in the main WC due to the two-way switching arrangements. In this instance the boost control is via ceiling mounted PIR presence detector unit.</p> <p>Method of installation: BS7211 on cable trays/ baskets concealed within ceiling void and dry wall construction.</p> <p><u>Door Bell</u></p> <p>Access to the Nursery is via a simple 12V doorbell system from the main front entrance. Bell sounders are located in the main connecting corridor and in play area 2.</p>

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4: BOXING CLUB

SCOPE OF WORKS	A complete new electrical installation has been carried out to serve the new walkway level Boxing club.
METHOD OF INSTALLATION	<p><u>Lighting & power.</u></p> <p>The electrical installation within the Boxing Club has been installed utilising a surface mounted steel trunking containment system with single core LSF cables. Drops to wall mounted accessories and switches are installed in galvanised steel conduit</p> <p>The installation can be considered fully rewirable for future services or alterations</p>
LUMINAIRES	<p>The main open gymnasium areas are served by protected high frequency (HF) fluorescent batten type luminaires mounted directly to the cable trunking containment system.</p> <p>Changing rooms and disabled WC are served by recessed LED down lights.</p> <p>Luminaires within changing room and WC suspended ceiling are connected to the hard wired installation via flexed plug-in ceiling rose units.</p>
LIGHTING CONTROL	Local wall mounted light switches to all areas
EMERGENCY LIGHTING	Emergency versions of standard light fitting within all areas. Emergency testing via local key switches.
SMALL POWER ACCESSORIES	Small power accessories within the Boxing club have been selected from the Deta 'Metal Clad' ranges.
FIRE ALARM	No fire alarm system was required in this section of the building.
MISCELLANEOUS ITEMS	<p><u>Disabled changing alarm:</u></p> <p>The disabled / special needs WC & changing room has been fitted with a standalone distress alarm call system.</p> <p>The system has pull cord activation within the WC cubicle and a flashing beacon/ sounder alarm outside the cubicle. The reset facility is located in the WC cubicle to ensure each call is actioned before the system can be silenced.</p> <p><u>Method of installation:</u></p> <p>230V power supply cabled in single core cables within steel conduits to the main control unit, then 1308 multi-core security cable to pull cord, reset and sounder units.</p>

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MISCELLANEOUS ITEMS	<u>Extract fan boost</u> The Boxing club changing area and disabled changing room have a mechanical extract ventilation (MEV) system installed. The MEV system is designed to 'trickle' continuously with a boost facility triggered by activation of the local light switches when the room is in use. The control circuit for the boost facility is a 230V circuit wired directly from the main MEV unit through a single pole of the double pole switches used to switch the general room lighting. Method of installation: LSF single core cables within steel conduit and trunking containment infrastructure.
	<u>Access control and door entry</u> The boxing club has a standalone door entry system which is interfaced with the building's main Entrotec access control system. An audio handset complete with door release button is installed within the main gymnasium area which receives calls from the ground floor door entry panel at the main entrance to the boxing club. The boxing club management has been issued key fobs to gain access to the main entrance at ground floor level.
	<u>Smoke ventilation</u> A smoke ventilation facility comprising actuator driven AOV window, smoke detection unit and fireman's override switch has been installed to ventilate the Boxing Club entrance lobby in emergency conditions. The AOV has been interfaced with the building's main smoke extract system and as such has is being monitored and can be controlled via the touch screen main control unit located in the building's main entrance foyer. <u>Method of Installation</u> FP200Plus cabling concealed within the building fabric

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5: COMMUNITY CENTRE

SCOPE OF WORKS	A complete new electrical installation has been carried out to serve the new ground floor Community Centre.
METHOD OF INSTALLATION	The Community Centre installation has been installed utilising BS7211 LSF multi core double insulated cabling on cable trays/ baskets, fully concealed within suspended ceiling voids and dry wall construction. Due to the inclusion of accessible lift out ceilings throughout, the installation can be considered fully rewirable for future services or alterations.
LUMINAIRES	Generally all luminaires within the Community Centre are high efficacy LED sources. All luminaires are connected to the hard wired installation via flexed plug-in ceiling rose units.
LIGHTING CONTROL	Local wall mounted light switches.
EMERGENCY LIGHTING	Emergency versions of standard light fittings within all other areas. Emergency testing via key switches adjacent to DB LL1.
SMALL POWER ACCESSORIES:	Small power accessories within the Community Centre have been selected from the MK Electrics 'Logic Plus' ranges.
FIRE ALARM:	No fire alarms required in this section of the building
MAIN HUB ROOM	The main hub or comms room housing control equipment for the building's door entry access control CCTV and smoke extract systems is located within the main Community Room suite. For details of above services refer to specific sections of this manual.
MISCELLANEOUS ITEMS:	<p><u>Disabled WC alarm:</u></p> <p>The disabled / special needs WC has been fitted with a standalone distress alarm call system.</p> <p>The system has a pull cord activation within the WC cubicle, a flashing beacon/ sounder alarm outside the cubicle and additional alarm in the main office. The reset facility is located in the WC cubicle to ensure each call is actioned before the system can be silenced.</p> <p>Method of installation: 230V power supply cabled in BS7211 twin & earth cable to the main control unit, then 1308 multi-core security cable to pull cord, reset and sounder units.</p> <p><u>Extract fan boost</u></p> <p>The Community room kitchen, WC and disabled WC have a mechanical extract ventilation (MEV) system installed.</p>

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MISCELLANEOUS ITEMS:	<p>The MEV system is designed to 'trickle' continuously with a boost facility triggered by activation of the local light switches.</p> <p>The control circuit for the boost facility is a 230V circuit wired directly from the main MEV unit through a single pole of the double pole switches used to switch the general room lighting.</p> <p>Method of installation: BS7211 on cable trays/ baskets concealed within ceiling void and dry wall construction</p>
	<p><u>Access control and door entry:</u></p> <p>The Community Centre, being a Landlord area is served by the building's main Entrotec access control and door entry system.</p> <p>An audio handset complete with door release button is installed within the main community room which receives calls from the ground floor door entry panel at the main building entrance.</p> <p>The Community Centre management has been issued key fobs to gain access to the main entrance at ground floor level.</p>
	<p><u>Smoke ventilation</u></p> <p>A smoke ventilation facility comprising actuator driven AOV vents, smoke detection unit and fireman's override switch has been installed to ventilate the Community Centre entrance lobby in emergency conditions.</p> <p>The AOV has been interfaced with the building's main smoke extract system and as such has is being monitored and can be controlled via the touch screen main control unit located in the building's main entrance foyer.</p> <p><u>Method of Installation</u> FP200 Plus cabling concealed within the building fabric</p>

6: MAIN ENTRANCE LOBBY (ATRIUM)

SCOPE OF WORKS	<p>A complete new electrical installation has been carried out to serve the new ground floor main entrance lobby & atrium area.</p> <p>Circuits are fed from DB LL2, which is located in the main hub room which is in the ground floor community centre.</p>
METHOD OF INSTALLATION	<p>The entrance lobby installation has been installed utilising BS7211 LSF multi core double insulated cabling on cable trays/ baskets, fully concealed within suspended ceiling voids and dry wall construction.</p>

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METHOD OF INSTALLATION	The suspended ceilings are an inaccessible metal frame type and as such the installation should be considered 'non rewirable'.
LUMINAIRES:	<p>A combination of feature pendants within the main atrium and vandal resistant bulkheads to walkways and stairs. Generally all luminaires are high efficacy LED sources.</p> <p>Main feature lighting is extra low voltage. There is a main lighting termination box within the ceiling void at Walkway level which houses the ELV driver units; this will need to be accessed for maintenance by a mobile working platform.</p>
LIGHTING CONTROL:	<p>Internal wall mounted photocell unit controlling all lobby lighting circuits through contactor units via a control circuit. The photocell is located on the wall at approximately 2.4m to the left hand side as you enter at the main entrance.</p> <p>Please note the project architect wished to create a "secure occupied" aesthetic within the entrance lobby when viewed from outside the building. Therefore the photocell unit is set to a sensitive level, ensuring that the lighting system will only switch off in bright sunlight conditions</p> <p>Lighting to each of the two main entrance canopies, atrium and boxing club, is controlled independently by externally mounted photocell units. These are set on 'dusk 'til dawn' factory settings.</p>
EMERGENCY LIGHTING:	<p>Emergency versions of standard luminaires.</p> <p>Emergency test via key switches adjacent to DB LL2</p>
SMALL POWER ACCESSORIES:	Lockable 13A socket outlets selected from the MK Electrics 'Metalclad Plus' ranges.
FIRE ALARM:	No fire alarm requirements in this section of the building
MISCELLANEOUS ITEMS:	<p><u>Environmental automatic opening vent (AOV) system</u></p> <p>The entrance lobby is fitted with AOV system to control the environment within the main glazed atrium.</p> <p>The system comprises 17 no. automatically controlled windows driven by actuator units which operate at a desired pre-set temperature via a thermostat sensor unit located, wall mounted on level 1 walkway. The temperature is set to open the windows at 21°C and close again when the temperature drops to 18°C. All actuators are cabled and set to work simultaneously.</p> <p>There is an additional rain sensor located on the main entrance canopy roof; this unit automatically closes open vents in rainy conditions.</p> <p>The main control panel is located in the community centre hub room, from this panel the system can be manually overridden or temperature ranges altered.</p>

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	<p><u>Method of Installation:</u> BS7211 LSF multi core double insulated cabling on cable trays/ baskets, fully concealed within suspended ceiling voids and dry wall construction.</p> <p><u>Special notes:</u> There is a main termination box located within the ceiling void, main lobby area on the level 2 walkway. This is accessed via a purpose made access hatch. The termination box is the main connection unit where the main circuit cables terminate with the flexes which run to each individual actuator unit.</p> <p>Access to this termination box must be via a mobile working platform</p>
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7: LIFT LOBBIES (NEW)

SCOPE OF WORKS	The existing ground, mezzanine, walkway and walkway 1 levels of the building have been converted into 9 no. new apartments. Subsequently the lift lobby areas have been stripped out, redesigned and refurbished. A complete new electrical installation has been installed.
METHOD OF INSTALLATION	<p>New lighting & small power services have been installed utilising Pirelli FP200 cabling concealed within the building fabric – steel conduit drops from ceiling void when services are on concrete supporting walls.</p> <p>Ceiling voids are inaccessible, therefore installation should be considered non-rewireable for future services without considerable damage to decoration.</p> <p>New circuits are cabled back to the existing Landlords distribution board (DB LL1) located in the main ground floor switch room</p>
LUMINAIRES	28W HF fluorescent vandal resistant bulkhead luminaires throughout.
LIGHTING CONTROL	Lift lobby lighting is 24-hour operational – no switching facility.
EMERGENCY LIGHTING	<p>Emergency versions of standard luminaires.</p> <p>Emergency test via key switches adjacent to DB LL1</p>
SMALL POWER ACCESSORIES:	Lockable 13A socket outlets selected from the MK Electrics 'Metalclad Plus' ranges.
FIRE ALARM:	<p>There is no audible fire alarm system within the building's lift lobbies.</p> <p>The lift lobbies are protected by forced automatic smoke extract system, which is activated by smoke detector units located within each lift lobby. Additionally there are Fire Brigade override switches also within each lobby.</p>

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	For full details of the building's smoke extract system refer to the specific section 3 of this manual and the associated mechanical services O&M manual.
MISCELLANEOUS ITEMS:	No additional systems

8: LIFT LOBBIES (EXISTING)

SCOPE OF WORKS	<p>Existing lift lobbies, serving levels xxx to xxx have been refurbished to accommodate the new district heating installation and associated service riser.</p> <p>The existing electrical installations have been adapted and re-used to accommodate the new bulkhead structures required to conceal the new district heating pipework.</p>
METHOD OF INSTALLATION	The existing installation is PVC single core cables in steel conduit containment emanating from the existing electrical service risers. Any alterations have been carried out like-for-like with LSF single core cables.
LUMINAIRES	The existing 28W 2D HF fluorescent Design Plan Quadrant vandal resistant luminaires have been re-used.
LIGHTING CONTROL	Lift lobby lighting is 24-hour operational – no switching facility.
EMERGENCY LIGHTING	<p>Emergency versions of standard luminaires.</p> <p>Emergency test via key switches adjacent to DB LL1</p>
SMALL POWER ACCESSORIES:	Lockable 13A socket outlets selected from the MK Electrics 'Metalclad Plus' ranges.
FIRE ALARM:	<p>There is no audible fire alarm system within the building's lift lobbies.</p> <p>The lift lobbies are protected by forced automatic smoke extract system, which is activated by smoke detector units located within each lift lobby. Additionally there are Fire Brigade override switches also within each lobby.</p> <p>For full details of the building's smoke extract system refer to the specific section 3 of this manual and the associated mechanical services O&M manual.</p>

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MISCELLANEOUS ITEMS:	<p><u>Wi-Fi power supplies</u></p> <p>Power supplies for a Wi-Fi system have been installed on levels x, x for a smart energy metering system. System installed by others. For further details refer to the mechanical services O&M manual set.</p> <p>The outlets are located in the main electrical risers and have been spurred from the Landlords small power circuit.</p>
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9: APARTMENTS

SCOPE OF WORKS	To design, supply & install the complete lighting and small power installations within each of the building's 9 no. new apartments. Works to include 230V domestic fire alarm system and works in association with mechanical heating & ventilation systems.																				
DISTRIBUTION:	<p>Surface mounted high integrity consumer control units (CCUs) located within entrance hall service cupboard.</p> <p>Apartment CCUs are split load units providing RCD protection to circuits as applicable and main switch MCB protection to dedicated circuits such as fire alarm.</p> <p>Typical circuit designation as follows:</p> <p>MCB Protected ways:</p> <table> <tr> <td>10A</td><td>Fire detection system</td></tr> <tr> <td>-</td><td>Spare way</td></tr> </table> <p>RCD1 Protected ways:</p> <table> <tr> <td>40A</td><td>Cooker control unit</td></tr> <tr> <td>32A</td><td>Lounge/ bedrooms ring circuit</td></tr> <tr> <td>-</td><td>Spare way</td></tr> <tr> <td>-</td><td>Spare way</td></tr> </table> <p>RCD21 Protected ways:</p> <table> <tr> <td>32A</td><td>Kitchen ring circuit</td></tr> <tr> <td>6A</td><td>Lighting circuit</td></tr> <tr> <td>16A</td><td>Mechanical radial – HIU, MEV</td></tr> <tr> <td>-</td><td>Spare way</td></tr> </table> <p>MCB units are 6kA with B-Type breaking curves</p>	10A	Fire detection system	-	Spare way	40A	Cooker control unit	32A	Lounge/ bedrooms ring circuit	-	Spare way	-	Spare way	32A	Kitchen ring circuit	6A	Lighting circuit	16A	Mechanical radial – HIU, MEV	-	Spare way
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METHOD OF INSTALLATION	<p>BS7211 LSF/ LSF double insulated multi-core cables fixed directly to ceiling soffits, routed through ceiling voids and dry lined stud partition walls.</p> <p>Generally fast fix dry lined back boxes have been utilised throughout. Fire rated intumescent pads have been utilised to all back boxes within main party walls between apartments and communal corridors.</p>																				

GRENfell TOWER: DESCRIPTION OF ELECTRICAL SERVICES

LUMINAIRES	<p><u>Luminaires: Walkway +1 (high ceiling apartments).</u> Lounge/ Bedrooms/ Entrance Hall: Standard bayonet cap pendants c/w compact fluorescent low energy lamps</p> <p>Kitchen: 2 no. 25W surface mounted LED panel luminaires Bathroom: 2 no. 18W HF fluorescent recessed down light</p> <p><u>Luminaires: Mezzanine (low ceiling apartments)</u> Lounge/ Bedrooms/ Entrance Hall: Decorative wall mounted glass sconce type luminaires with 12W LED E27 lamp</p> <p>Kitchen: 2 no. 25W wall mounted LED panel luminaires Kitchen: Over counter LED strip task lighting Bathroom: 1 no. 25W wall mounted LED panel luminaire</p>
LIGHTING CONTROL	Local room light switches
EMERGENCY LIGHTING	Not applicable
LIGHTING & POWER ACCESSORIES:	Lighting & power accessories have been selected from the MK White Logic Plus ranges.
FIRE ALARM:	<p><u>Walkway apartments</u> 230V mains connected system to LD1 standard, comprising heat detector unit within the kitchen area and smoke detector units within all other habitable rooms</p> <p><u>Mezzanine apartments</u> 230V mains connected system to LD3 standard, comprising heat detector unit within the kitchen area and smoke detector within entrance hall.</p>
MISCELLANEOUS ITEMS:	<p><u>Telephone installation:</u> A dedicated telephone line has been cabled back to the building's BT mainframe. The master outlet is located within the main lounge of each apartment.</p> <p><u>Door entry system</u> Each apartment is equipped with an Entrotec audio door entry handset connected to and able to open the main entrance door to the building</p> <p><u>Extract fan boost</u> The new apartments have a mechanical extract ventilation (MEV) system installed.</p> <p>The MEV system is designed to 'trickle' continuously with a boost facility triggered by activation of the local light switches which runs on for a desired pre-set time period after the switch has been turned off. There is an additional switch located within the kitchen which when activated boosts the system only for the desired pre-set time period.</p>

GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

MISCELLANEOUS ITEMS	<p>The control circuit for the boost facility is a 230V circuit wired directly from the main MEV unit through a single pole of the double pole switches used to switch the general room lighting.</p> <p>Method of installation: BS7211 on cable trays/ baskets concealed within ceiling void and dry wall construction.</p>
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10: DOOR ENTRY & ACCESS CONTROL

INTRODUCTION	<p>The system has been installed on a subcontract basis by nominated subcontractor SW Security. For detailed information please refer to section 4 of this O&M manual set.</p>
SCOPE OF WORKS	<p>Design, install & commission a new Entrotec audio door entry and access control system serving the building's 129 no. dwellings, which is to integrate with the existing site wide PAC – Stanley access control system.</p> <p>To extend the PAC access system to accommodate 7 no. additional doors within the Grenfell Tower building as follows:</p> <ul style="list-style-type: none">• Main entrance to building• Main entrance to Boxing Club• Entrance to ground floor Community Centre• Main atrium partition door between entrance lobby & Boxing Club stairs• Door to ground floor lift lobby• Door to mezzanine lift lobby• Door to level 1 lift lobby <p>To relocate the main PAC – Stanley head end equipment from basement plant area to a new main hub room located at ground floor level within the new community centre.</p> <p>Note: Existing cabling and containment between floor level service risers to apartment handsets has been retained and revised. All other elements of the Grenfell Tower building door entry and access control systems have been renewed.</p> <p>The existing front end PC complete with Easy Net residential software has been retained and reused.</p>
DESCRIPTION	<p>Grenfell Tower is served by an integrated door entry and access control system. The door entry is an Entotec Apex audio only door entry system, which has been integrated into the existing site wide PAC Stanley access control system. The two systems have been fully integrated so that the access system fob readers are incorporated into the existing Entrotec entry panels.</p> <p>The door entry system serves each of the building's 129 no dwellings as well as the ground floor community centre. Each have been supplied with a new audio handset receiver, which when activated unlocks the main front entrance magnetic locking devices.</p>

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DESCRIPTION	<p>The access control system has two main entry panels, one at the main building entrance and one at the side entrance to the boxing club. There are a further 5 no. internal doors on the system as previously listed.</p> <p>The main control equipment and front end PC for both systems is located in the new hub room which is within the new ground floor community centre.</p> <p>The front end PC is equipped with Easy Net residential software package; new key fobs can be programmed and issued from this location.</p> <p>The access control system forms part of a site wide PAC Stanley access control system which also serves the neighbouring Grenfell Estate buildings.</p> <p>The tenants' existing key fobs are compatible with the new system. 5 no. additional key fobs have each been issued to the community centre and boxing club respectively</p> <p>Fireman's "drop key" override switches have been installed at each of the two main entrances, once activated the system has been programmed to hold open all internal lift lobby doors for a 2-minute period to allow Fire Brigade entry into the main lift cores.</p> <p>Additionally the system is programmed so that when a resident "buzzes in" a guest at the main front entrance, the door to the ground floor lift lobby is held unlocked for a further 20 seconds to allow the guest access to the lift lobby without the use of a fob.</p> <p>The system push-to-exit buttons are combined PTE & emergency 'fail safe' override units. This is to negate the use of emergency override break-glass units which are constantly subject to vandalism, which in turn renders the entire system unsecure.</p> <p>To use the push-to-exits in override mode the push button must be held in a depressed position whilst simultaneously opening the door.</p> <p>Additional notes: The boxing club has a 'standalone' door entry system which is also integrated into the PAC Stanley access control system.</p> <p>The Day Nursery premises has no interface with the PAC Stanley access control system. Access to the Nursery is via a doorbell system from its' main entrance at ground floor level</p>
METHOD OF INSTALLATION	<p>The system is cabled using ELV CW1308 security cable, generally routed on galvanised cable trays or within steel conduits, concealed within the building fabric.</p> <p>The system's main control panel is located in the ground floor hub room; sub panels are installed within the main electrical risers, located either side of the main lift shafts.</p> <p>Each door entry handset is individually cabled to ensure continuity of system should cabling to a single handset be compromised.</p> <p>The system should be considered generally un-rewireable, although the main backbone structure can be accessed, replaced via the main service risers, and the main front entrance panel can be accessed via floor ducts from the main hub room.</p>

GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

<p>SYSTEM PROTOCOLS:</p>	<p>Main Entrance Entry Panel:</p> <ul style="list-style-type: none"> • Primary function is to provide access and egress to the building's 129 no. apartments and Community Centre • Residents access is via assigned proximity fob • Visitor access via audio call • Egress via 'push-to-exit' button • Residents entry for apartments only - no access to Community Centre • Fireman's override emergency entry switch. <p>Boxing Club Entry Panel:</p> <ul style="list-style-type: none"> • Primary function is to provide access and egress to the level 1 Boxing Club premises • Management access via assigned proximity fob • Visitor access via audio call • Egress via 'push-to-exit' button • Boxing Club entry only – no access for Grenfell Tower residents • Fireman's override emergency entry switch. <p>Internal Door - Entrance Community Centre:</p> <ul style="list-style-type: none"> • Primary function is to provide access and egress to the Ground floor Community Centre • Management access via assigned proximity fob • Visitor access via audio call • Egress via 'push-to-exit' button • Community centre access only– no access for Grenfell Tower residents <p>Internal Door – Glazed partition in main Atrium:</p> <ul style="list-style-type: none"> • Primary function is to provide access and egress between Grenfell Tower entrance lobby and staircase to walkway levels. • Residents access via assigned proximity fob • No visitor access through this door • No 'push-to-exit' facility • Access for Grenfell residents only • No access for Boxing Club or Community Centre <p>Internal door – Ground floor lift lobby</p> <ul style="list-style-type: none"> • Primary function is to provide access and egress to the ground floor lift lobby • Residents access via assigned proximity fob • Visitor access via timed delay from main entrance call panel • Egress via 'push-to-exit' button • Residents/ visitors entry only <p>No access for Community Centre users</p>
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GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

SYSTEM PROTOCOLS:	<p>Internal door – Mezzanine lift lobby</p> <ul style="list-style-type: none">• Primary function is to provide access and egress to the mezzanine lift lobby• Residents access via assigned proximity fob• No visitor access to this door• Egress via 'push-to-exit' button• Residents' entry only• No access for Boxing Club users <p>Internal door – Walkway Level 1</p> <ul style="list-style-type: none">• Primary function is to provide access and egress to the mezzanine lift lobby• Residents access via assigned proximity fob• No visitor access to this door• Egress via 'push-to-exit' button• Residents' entry only• No access for Boxing Club users
MISCELLANEOUS ITEMS:	

11: CCTV INSTALLATION

INTRODUCTION	<p>The system has been installed on a subcontract basis by nominated subcontractor SW Security. For detailed information please refer to section 4 of this O&M manual set.</p>
SCOPE OF WORKS	<p>Relocate front end equipment of existing site wide CCTV system from the original strong room location to the new main hub room, located within the new ground floor Community Centre.</p> <p>Design, supply and install a new digital I.P HD CCTV system to monitor the Grenfell Tower main entrance atrium and ground floor lift lobby.</p>
DESCRIPTION	<p>A new CCTV system has been installed to monitor the main entrance atrium and ground floor lift lobby. There are a total of 5 no. digital I.P. dome cameras – locations as follows:</p> <ol style="list-style-type: none">1. External – mounted on the main entrance canopy2. Main entrance lobby – viewing the Community Room entrance3. Main entrance lobby – viewing the main entrance door4. Boxing Club entrance lobby – viewing the main entrance5. Ground floor lift lobby. <p>The front end recording equipment comprises an 8-channel digital I.P. HD recorder with 12Tb storage and is located within the main hub room.</p> <p>The system is internet protocol and as such can be remotely interrogated by the end user.</p>

GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

METHOD OF INSTALLATION	<p>RG59 coax cable and Cat5E cable from hub room to each camera. All cabling concealed on cable trays within building fabric.</p> <p>The installation should be considered non-rewireable</p>
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12: SMOKE EXTRACT VENTILATION SYSTEM

SCOPE OF WORKS	<ol style="list-style-type: none">1. To install the smoke detection & control elements of the building's main smoke extract system. Control equipment such as control panels, fire override switches and pressure switches have been supplied by specialists PSB. Smoke detector units have been provided as part of the electrical contract.2. To supply and install a 'standby' life safety power supply from the adjacent Grenfell Walk building to ensure secondary power supplies should the primary Grenfell Tower supply suffer a failure.3. Supply and install fire rated power supplies to PSB system equipment in accordance with PSB requirements.4. Supply and install 2 no monitored smoke vent systems to serve the Boxing Club and Community Centre main entrance lobbies.
DESCRIPTION OF ELECTRICAL WORKS	<p>An extensive forced smoke extract & environmental ventilation system has been installed to serve the lift lobby areas of the building. The system has been designed by specialist subcontractors PSB and has been delivered as part of the main mechanical services package.</p> <p>For details of the system and its' functionality please refer to the specific section within the mechanical services O&M manuals</p> <p>Main & sub main power supplies, fire detection and system controls have been carried out within the electrical services package.</p> <p><u>Main supplies:</u></p> <p>The building's main smoke extract system is deemed a 'life safety' system and as such under BS9999 2008 must be provided with fire protected primary and secondary or essential power supplies</p> <p>The primary power supply, rated at 40A 3-phase emanates from the main Grenfell Tower Landlords busbar unit and terminates into a dedicated 2-way TP&N distribution board located adjacent to the busbar in the main Grenfell Tower LV switch room.</p> <p>The secondary power supply, rated at 40A 3-phase emanates from the neighbouring Grenfell Walk building and terminates into a second dedicated 2-way distribution board which is located in the Grenfell Tower main ground floor hub room.</p> <p><u>Sub-main power supplies:</u></p> <p>The smoke extract system is served by two main inverter panels which feed the system's main extract fans and outstations. Inverter panel no. 1 is located in the ground floor main hub room; inverter panel no. 2 is located at roof level in the main tank room.</p>

GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

DESCRIPTION OF ELECTRICAL WORKS	<p>In compliance with BS 9999 each of the 2 panels require both primary and secondary power supplies which should be installed, taking separate routes from source to final destination. The cables should be fire rated and the cable runs should take separate routes so as to avoid simultaneous mechanical or physical damage from a major event such as a gas explosion from one of the apartments.</p> <p>In a new build scenario this would be achieved by designing separate paths or risers within the fabric of the building. However in the case of Grenfell Tower which is an existing building, the only service routes are formed around one central core, making it impossible to provide separate cable routes within the confines of the existing building.</p> <p>As a result of the a consultation with Kensington & Chelsea Building Control it has been agreed that both supplies could be installed within the central core, within separate risers either side of the main lift shafts. The rationale being that although installed within the same fire compartment, both cables are 2-hour fire rated and are separated by sufficient distance so as to avoid simultaneous mechanical / physical damage.</p> <p><u>Control Stations</u></p> <p>From the main inverter panels a series of outstation control panels have been installed at each level of the building.</p> <p>It is from these outstations that the control circuits powering the floor level damper units, smoke detectors, Fire Brigade override switches and pressure switches have been cabled.</p> <p><u>A.O.V. Systems</u></p> <p>Two no. additional smoke ventilation facilities, comprising actuator driven AOV window, smoke detection unit and fireman's override switch have been installed to ventilate the Boxing Club and Community Centre entrance lobbies in emergency conditions.</p> <p>Each AOV has been interfaced with the building's main smoke extract system and as such has is being monitored and can be controlled via the touch screen main control unit located in the building's main entrance foyer.</p>
METHOD OF INSTALLATION	<p><u>New Secondary Supply from Grenfell Walk</u></p> <p>The main secondary supply from Grenfell Walk is routed from the local Landlord's intake no. 7 located at mezzanine level. The intake is situated directly opposite Grenfell tower, on the other side of the service road that dissects the two buildings.</p> <p>The new supply is a 40A TP&N and emanates from spare capacity on the general Landlord's lighting and power distribution system. The new supply is clearly labelled to indicate its' "essential supply" status and the location of its' designated load.</p> <p>The new supply cable has been installed using Pirelli FP600 2-hour fire rated steel wire armoured (SWA) cable. The cable exits at high level to the rear of the Grenfell Walk intake room, and then utilises existing high level containment infrastructures across the service road which adjoins the high level soffit of the main entrance canopy to Grenfell Tower.</p> <p>From the Grenfell Tower entrance canopy soffit the new supply enters the Grenfell Tower building via the existing cable way through the fresh air duct down into the basement boiler house.</p>

GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

METHOD OF INSTALLATION	<p>Once entering the basement area the supply cable routes through to the central core, utilising existing steel cable tray containment and turns up into the new main hub room where it terminates to the new secondary essential services distribution board.</p> <p><u>Primary & secondary power supplies to roof top panel</u></p> <p>The primary power supply to the roof top panel is rated at 20A TP&N and emanates from the primary essential services distribution board located within the main Grenfell Tower electrical LV switch room.</p> <p>From the distribution board Pirelli FP600 fire rated SWA cable has been installed across the short distance through the basement telecom hub room to the main service riser on the right hand side of the main lift shaft. From here the cable runs vertically up the main service riser into the main roof top plant area. Once in the roof top plant room the cable terminates, along with the secondary supply into an automatic changeover unit located adjacent to the main roof top inverter panel.</p> <p>The secondary power supply to the roof top panel is rated at 20A TP&N and emanates from the new secondary essential service distribution board located in the main ground floor hub room. The supply is installed in FP600 SWA cable, routed up through the main service riser to the left hand side of the main lift shaft to the main roof top plant area. Once in the roof top plant room the cable terminates with the primary supply to the aforementioned automatic changeover unit located adjacent to the main roof top panel.</p> <p>In the roof plant area both cables, as far as is practicable take separate routes from the service riser entry points to the final location of the roof top panel.</p> <p>The FP600 cabling is generally installed on galvanised steel cable tray containment fastened with stainless steel cable ties.</p> <p><u>Primary & secondary power supplies to ground floor hub room</u></p> <p>The primary power supply to the ground floor inverter panel is rated at 20A TP&N and emanates from the primary essential services distribution board located within the main Grenfell Tower electrical LV switch room.</p> <p>From the distribution board Pirelli FP600 fire rated SWA cable has been installed across the short distance through the basement telecom hub room over to the service riser on the left hand side of the main lift shaft. From there the cable runs the short distance up into the main ground floor hub room, where it terminates, along with the secondary supply into an automatic changeover unit located adjacent to the ground floor inverter panel.</p> <p>The secondary power supply emanates from the new secondary essential services distribution board located in the main ground floor hub room. The supply is installed using single core cables within steel trunking, terminating into the aforementioned automatic changeover unit located adjacent to the ground floor inverter panel.</p> <p>The FP600 cabling is generally installed on galvanised steel cable tray containment fastened with stainless steel cable ties.</p>
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GRENFELL TOWER: DESCRIPTION OF ELECTRICAL SERVICES

	<p><u>Control equipment</u></p> <p>Circuits serving outstations, damper units and control equipment have been carried out using Pirelli FP200 Plus multi-core fire rated cable on steel cable trays when in service risers and clipped direct the building fabric in lift lobby areas.</p> <p>The master outstation is located within the main ground floor hub room, the remaining outstations are located within new riser shaft at each building level</p>
ADDITIONAL NOTES:	<p><u>Power Supply Status Monitoring</u></p> <p>In accordance with the guidance set out in BS5999: 2008 - Code of Practice for Fire Safety in the Design, Management and Use of Buildings as there is no designated fire control room there is no requirement for a central status panel to monitor the system primary and secondary power supplies.</p> <p>Each of the two system automatic changeover units will have their own supply indicators incorporated within the unit. These will indicate that a power supply is present and whether the unit is currently running on either the primary or secondary supply.</p>
CAUSE & EFFECT	Refer to Mechanical services O&M information