**Landlord Services**

**Neighbourhoods**

**Planned Programmes**

**Mechanical and Electrical Section**

**Preliminaries, Materials, Workmanship**

**& Specification of Works**

**Fire Sprinkler Installation**

**Site Address:**

**Butler House**

**Summerhill Road**

**St George**

**Bristol**

**BS5 8HQ**

**Works to be carried out on behalf of Bristol City Council**

**Service Director**

**The Bungalow**

**Sandy Park Road**

**Brislington**

**Bristol**

**BS4 3NZ**

**Engineer: Rich Griffin**

**Date: May 2020**

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# 1.0 Specification of Works

1.1 Performance Objectives

### 1.1.1 General

This specification is for automatic fire sprinklers that are to be installed in residential and/or domestic occupancies and within the scope of British Standard 9251:2014

This British Standard covers design, installation, components, water supplies, backflow protection, commissioning, maintenance and testing of residential sprinkler systems installed for the purpose of reducing risk to life.

These systems are primarily intended for the protection of life in case of fire and have additional benefits for property protection, environmental protection, sustainability of buildings and continuity of use and firefighter safety.

The recommendations of British Standard BS9251:2014 are also applicable to any addition, extension, repair or other modification to a residential sprinkler system.

Where applicable, the LPC Rules for Automatic Sprinkler Installations 2015

Published by the Loss Prevention Council and incorporating BS EN 12845.

This shall include retail units, commercial premises, basement car parks etc.

### 1.1.2 Scope of Works

#### 1.1.2.1 Sprinkler Installer’s Responsibilities

Design, supply, install, set to work, test, commission, fully certify and handover a fully operational sprinkler system in accordance with the function and performance with the requirements as stated in BS: 9251: 2014 Fire Sprinkler Systems for Domestic and Residential Occupancies – Code of Practice and if applicable, the LPC Rules for Automatic Sprinkler Installations 2015 published by the Loss Prevention Council and incorporating BS EN 12845.

Confirm that the Installer’s company name appears in the current “List of Approved Products and Services” published by the LPC and the current list of “LPCB Quality Assessed Companies to ISO 9001/BS 5750-1” published by the Loss Prevention Certification Board (LCPB) and the contractor has the required levels of competency to carry out, without supervision, the design, installation, testing and commissioning of the sprinkler system(s) as specified.

Provide pressure and flow requirements at each and every design point and flushing/test connection.

Confirm that the Installer’s name appears in the current ”List of Approved Products and Services” and the contractor has the suitable level of competency to carry out, without supervision, the design and installation of the system/s as specified herein.

Adopt the outline scheme design proposals indicated on the Tender drawings and specification and develop them into a detailed design of the system.

Prior to commencing the installation of the works, written approval should be obtained from the ‘Authority having Jurisdiction ‘(AHJ)

Included within the design should be the following aspects:

* Sprinkler installation.
* Ensure that all components and equipment are approved and listed under the current. ”List of Approved Products and Services”.
* Co-ordination of sprinkler positions with other building services including lighting, CCTV etc.
* Acoustic and vibration control measures.
* Pipe supports, guides and anchors.
* Expansion/contraction provision.
* Production of drawings.
* Interfaces with the BMS and fire alarm systems, if applicable, ensuring correct communication protocol.

Provide power and control wiring between the sprinkler pump motor control panel and the common remote indicator panel.

Provide power wiring to the sprinkler pump motor control panel from the distribution board in the plant room.

Provide power and control wiring to the sprinkler pumps from the motor control panel and in accordance with the relevant British Standard.

Ensure that the electrical and controls installations are made by an Electrical Contracting company that is a member of the Electrical Contracting Association (ECA) and the National Inspection Council for Electrical Installation Contracting (NICEIC).

## 1.2 Design Parameters

## 1.2.1 General

Prior to committing to any design of a residential sprinkler system for a specific property, the designer should evaluate at least the following factors before starting work on the project including acquiring specialist advice where necessary:

* The risks to be protected, including the fire loading.
* The type of occupancy of the property.
* The water supply requirements and availability.
* Any special circumstances.

Note: In some buildings or parts of buildings, a higher level of protection may be required than that provided in BS9251:2014 (BS EN 12845)

The designer must ensure that consultation takes place at an early stage with all relevant stakeholders/authorities having jurisdiction (AHJ’s) and/or others who may have a direct interest in the installation, included but not limited to:

* The Water Undertaker.
* The Fire Authority.
* The Licensing Authority.
* Building Control.
* The Insurer of the building and its contents.
* The Client – in particular, any considerations regarding vulnerability.

## 1.3 System Description

The sprinkler system shall be designed with a classification suitable for residential accommodation in high rise blocks of flats of occupancy normally expected in that environment.

The system shall be designed in accordance with BS 9251:2014 which gives recommendations for the design, installation, main components, water supplies, testing and commissioning in a domestic and residential occupancy.

The residential fire sprinkler installation shall include a water supply (mains fed or stored water), pump sets, backflow prevention device (check valve, air gap), isolating valves, flow switches, zone valves, automatic alarm system, pipework, sprinkler heads and all ancillary equipment (pressure gauges, test points etc.).

## 1.4 Controls & Alarm Requirements

### 1.4.1 General

To be in accordance with the requirements of BS 9251:2014 Fire Sprinkler Systems for Domestic and Residential Occupancies – Code of Practice and where applicable, the LPC Rules for Automatic Sprinkler Installations 2015 published by the Loss Prevention Council and incorporating BS EN 12845.

All alarm devices which are used in a domestic and residential environment must be installed in accordance with the manufacturer’s instructions.

### 1.4.2 System Operation Alarm

A water flow alarm switch shall be installed which will give reason for the addressable alarm panel to operate when the sprinkler system automatic control valve opens.

### 1.4.3 Fire Sprinkler Pump Sets

Provide an audible alarm at the BMS when CWS tank water level is below the low water level and/or in the event of pump failure.

Provide volt free contacts in the pump control panel for every one of the conditions listed below, for transmission of status or warning to the BMA.

When more than one fire pump is present, ensure that the sprinkler pumps are configured as duty and back-up units with automatic changeover.

Provide pressure switches to control each pump operation suitable for adjustment to suit actual site conditions.

Provide automatic starting controls and manual stop to the pumps as per requirements.

Provide a remote indicator panel.

Provide at the sprinkler pump motor control panel and the common remote alarm panel, the audible and visual warnings of the following conditions:

* Sprinkler Pump No1
* Pump on Demand.
* Pump Running.
* Supply Failure.
* Pump Trip.
* Sprinkler Pump No2.
* Pump on Demand
* Pump Running.
* Supply Failure.
* Pump Trip .

Provide a volt free contact within the sprinkler pump motor control panel for connection to the BMS to identify that the panel has been activated, labelled “Sprinkler Pump Alarm panel activated”

### 1.4.4 Valve Status

Provide electrical monitoring of the status of the complete installation, Control, Stop and Alarm valves.

Monitored valves shall be wired into the local Addressable Control Panel.

All other valves shall be monitored by means of a micro switch to indicate whether open or shut.

## 1.5 System Components

### 1.5.1 External Pipework

#### 1.5.1.1 Underground Pipework

Pipes shall be laid in accordance with the suppliers recommendations. Pipes and fittings shall comply with the requirements of the water supplier’s code of practice. Pipes and fittings should have sufficient corrosion resistance. Adequate precautions should also be taken to prevent damage to piping, such as passing vehicles and plant. Pipes and fittings should be cast iron, ductile iron, spun iron, reinforced glass fibre or high density polyethylene.

### 1.5.2 Internal pipework

#### 1.5.2.1 CWS Tank Room

Pipework in tank room downstream of incoming mains cold water isolation valves shall be black medium weight steel pipe to BS EN 10255, copper pipe to BS 2871 (BS EN 1057) or pressed steel (carbon or stainless steel) pipes and fittings in accordance with the appropriate specifications and British Standards valid for use in the system. When steel pipes of equal or less than 150mm dia. are threaded, cut, grooved or otherwise machined, should have a minimum wall thickness in accordance with ISO 65

#### 1.5.2.2 Risers

Pipework for risers shall be black medium weight steel pipe to BS EN 10255, copper pipe to BS 2871 (BS EN 1057) Screwed fittings should be malleable iron to BS 143 (BS EN 2041) and copper fittings to BS 864 (BS EN 1254) or pressed steel (carbon or stainless steel) pipes and fittings in accordance with appropriate specifications and British Standards. All black medium weight steel pipework shall be coated with one coat of red-oxide primer at works and re-coated following installation.

Steel pipe and fittings less than 50mm diameter shall not be welded on site unless installer uses an automatic welding machine. In no case shall welding, flame cutting, soldering or any other hot work be carried out in-situ. Welding of sprinkler pipework shall be carried out in such a way that:

* All joints are welded continuously.
* The inside of the weld does not interfere with the flow of water.
* The piping is deburred and the slag removed.
* Pipework should be installed in such a way that pipes are not exposed to mechanical damage.
* Pipework shall also be installed in such a way that it is easily accessible for repairs and alterations. Pipework shall not be embedded in concrete floors or ceilings.
* Wherever possible, pipework should not be installed in concealed spaces, which make inspection, repairs and modifications difficult.

#### 1.5.2.3 Communal Areas

Pipework for risers shall be black medium weight steel pipe to BS EN 10255 or copper pipe to BS 2871 (BS EN 1057) Screwed fittings should be malleable iron to BS 143 (BS EN 2041) and copper fittings to BS 864 (BS EN 1254) or pressed steel (carbon or stainless steel) pipes and fittings in accordance with appropriate specifications and British Standards. All black medium steel pipework shall be coated with one coat of red-oxide primer at works and re-coated following installation.

Steel pipe and fittings less than 50mm diameter shall not be welded on site unless installer uses an automatic welding machine. In no case shall welding, flame cutting, soldering or any other hot work be carried out in-situ. Welding of sprinkler pipework shall be carried out in such a way that:

* All joints are welded continuously.
* The inside of the weld does not interfere with the flow of water.
* The piping is deburred and the slag removed.
* Pipework should be installed in such a way that pipes are not exposed to mechanical damage.
* Pipework shall also be installed in such a way that it is easily accessible for repairs and alterations. Pipework shall not be embedded in concrete floors or ceilings.
* Wherever possible, pipework should not be installed in concealed spaces, which make inspection, repairs and modifications difficult.

#### 1.5.2.4 Residential Flats

Pipework and fittings in residential flats/apartments shall be ‘Blazemaster’ CPVC approved and certified for use in accordance with BS9251:2014 and BS EN 12845.

Jointing of pipework with fittings should be made by solvent cement welding methods using a proprietary solvent cement adhesive. All burrs and fittings should be removed externally and internally prior to making the joint.

Pipework should be installed in such a way that pipes are not exposed to mechanical damage.

Pipework shall also be installed in such a way that it is easily accessible for repairs and alterations. Pipework shall not be embedded in concrete floors or ceilings.

Wherever possible, pipework should not be installed in concealed spaces, which make inspection, repairs and modifications difficult.

Once a joint has been made it should be left to cure in accordance with instructions and prior to any system pressurization.

#### 1.5.2.5 Gradients

Pipework should be fixed in a manner that supports the draining of sections and/or the complete installation. Gradients of pipework should be determined by site conditions and in co-ordination with other services. Sprinkler pipework should be installed with the following minimum gradients:

* “Wet” sprinkler installation -2mm in 1.0m all pipework.

#### 1.5.2.6 Pipe Supports

Pipe supports shall be designed in accordance with requirements of British Standard 9251:2014 and Section 17.2 and Table 40 & 41of the LPC Rules.

Pipe supports shall in all cases be fixed directly to the structure. They should not be used for supporting any other installations.

The part of the structure to which the supports are fixed should be capable of supporting the pipework.

Distribution and riser pipework should have a suitable number of fixed points to take account of axial forces. No supports should be manufactured from combustible materials.

In order to secure an even load-bearing capability, pipe supports shall be of the adjustable type, should completely surround the pipe and shall not be glued, soldered or welded to the pipe or fittings.

Where supports for copper pipework are required, they shall be provided with a suitable lining with sufficient electrical resistance to prevent contact corrosion.

Supports should be secured in accordance with the manufacturer’s instructions.

Maximum spacing of pipe supports should be in accordance with BS 9251:2014 Appendix D.

#### 1.5.2.7 Drainage

All pipework must have the means to be completely drained. A drain valve must be installed at the control valve set. In the event that the whole system cannot be drained through this drain valve, additional valves should be fitted in specific locations to supplement draining.

Drain valves should be sized and fitted in accordance with BS 9251:2014 and Section 15.4 and Table 39 of the LPC Rules.

#### 1.5.2.8 Flushing/Test Connections

Flushing connections shall be fitted on the spur ends of the installation distribution pipework with or without permanently installed valves.

Flushing connections should be the same pipe diameter as the main distribution pipework. All connections should be fitted with a blank plug.

Flushing connections may also be used to check the availability of water and also for carrying out flow and pressure tests.

#### 1.5.2.9 Frost Protection

Fire sprinkler pipework will generally be installed within the heating envelope of the building and should not require any frost protection.

Frost protection will be required for all pipework, fittings, pumps etc. which will be exposed to temperatures below freezing. This will include plantrooms, external pipework, underground pipework and void spaces.

All exposed pipework within unheated spaces or outside the building which may be exposed to frost, shall be trace-heated over the exposed length and subsequently wrapped with thermal insulation to a thickness recommended by the trace-heating suppliers and weather protected in exposed positions.

All underground pipework shall be trace-heated over the entire length and subsequently wrapped in a waterproof covering.

The electrical input to the frost protection system should be fed from a reliable supply, independent of all other supplies to ensure that supplies are not inadvertently switched off.

The electrical supplies to the frost protection system should have indicator lights and ammeters to show that power is on.

Where possible these should be located on a single indicator board.

All other pipework etc. throughout the building is to be maintained at 4°C or above at all times. Frost stat controls shall be provided.

## 1.6 Pipeline Ancillaries

### 1.6.1 General

All pipework ancillaries including control valves, isolation valves, test valves, flow switches, pressure switches and sprinkler heads should all be sized and fitted in accordance with BS 9251:2014.

### 1.6.2 Control Valve Set

A set of installation control valves should be provided on each fire sprinkler installation in accordance with BS EN 12259-2 or BS EN 12259-3. The location of valves etc. is to be determined by the Engineer.

Each installation control valve set should include all necessary water proving apparatus and alarm testing facilities. A ‘wet’ type alarm valve shall incorporate an addressable Bellcheck which is incorporated to allow for remote and automatic alarm valve testing from a single control unit. The addressable Bellcheck would also ease testing, ease record keeping and encourage sustainability. An approved strobe/sounder shall be installed rather than the traditional water motor alarm gong.

### 1.6.3 Stop Valves

All isolating/stop valves which close off the water supply to the sprinklers should:

* Close in a clockwise direction.
* Be fitted with an indicator which clearly identifies whether in the open or closed position.
* Be secured in the right position using a strap and padlock or equivalent.
* All gate valves should comply with BS 5163 and butterfly valves which must be gear operated in accordance with BS 5155.
* Stop valves must not be installed downstream of the control valve set other than for testing and maintenance providing they are monitored.

### 1.6.4 Drain Valves

Drain valves shall be fitted as follows:

* Immediately downstream of the control valve set or downstream isolating valve if fitted.
* Immediately downstream of any subsidiary isolating valve.
* Immediately downstream of any subsidiary alarm valve
* Any pipe, with the exception of droppers to sprinklers, which cannot be drained through another drain valve.
* Drain valves should not be fitted any higher than 3.0m above floor level, fitted with a blank plug and sized in accordance with BS 9251:2014 and Table 39 of the LPC Rules.

### 1.6.5 Test Valves

A test valve shall be included in the control manifold and located externally to each flat/apartment. It shall be fitted as follows:

* The valve should be fitted downstream of the flow switch to allow testing of the switch.
* A test valve should also be incorporated into the system Immediately after the main incoming water flow switch within the control valve arrangement in the plantroom and in accordance with BS 9251:2014
* The test valve should be suitably sized so that the flow rate at that point in the system can be checked.

### 1.6.6 Pressure Gauges

A pressure gauge shall be installed on the incoming water main pump suction and delivery pipes and adjacent to each pump initiation pressure switch to monitor system pressure.

A pressure gauge shall also be included in the control manifold, external to each flat/apartment.

Pressure gauges must have the means to be removed or replaced without the need to interrupt system water supplies.

### 1.6.7 Water Flow Alarm Switches

The fire sprinkler installation shall be sub-divided into zones with water flow alarm switches incorporated into the system on each branch of the network and in the plantroom at the main control valve position.

Flow switches which serve each flat/apartment can be incorporated within the control manifold sited externally to the space.

### 1.6.8 Pressure Switch

An approved pressure switch shall be provided within the sprinkler installation at the main control valve.

### 1.6.9 Electronic Sounder and Strobe

An electronic sounder and strobe shall be installed external to the plantroom where all the main fire sprinkler plant is situated. The sprinkler installation must have the means of sending an alarm signal which results in the activation of the sounder and strobe.

### 1.6.10 Flow Measuring Device

An approved Flow Measuring Device must be provided in the Pump/Tank Room.

### 1.6.11 Sprinkler Heads

Sprinkler heads should be stored, handled and installed in accordance with the manufacturer’s instructions. Particular care should be taken to ensure that the sprinkler heads are not damaged in any way prior to fitting, especially the glass bulb, fusible link and the deflector. The sprinkler heads are installed using the appropriate wrench supplied by the sprinkler manufacturer. Protective covers should be left in place until the installation has been completed and the system is ready to be commissioned.

### 1.6.12 Residential Flats & Communal Areas

Sprinkler heads shall be the flat plate concealed, horizontal sidewall type sprinkler fully concealed behind a flat cover plate with a white polyester finish to give the appearance of a smooth finish.

Sprinklers should be of the type that includes a high-sensitive solder link and lever suitable for installation on concealed pipe systems.

The sprinkler orifice should have a K Factor which will allow the efficient use of available water supplies in a hydraulically designed fire-protection system.

The operating element and deflector must meet the characteristics required in a residential situation.

The two-piece sprinkler head shall allow for installation and testing prior to the cover plate being installed.

### 1.6.13 Plantrooms & Refuse Bin Rooms

Sprinkler heads in the plantrooms shall be the quick response pendent sprinkler suitable for installation in a boiler house/plantroom environment.

Sprinklers should be of the type which has a small thermosensitive glass bulb.

The sprinkler orifice must have a K Factor which will allow the efficient use of available water supplies in a hydraulically designed fire sprinkler system.

The operating element and deflector must meet the characteristics required for installation in a boiler house/plantroom situation.

### 1.6.14 Addressable Sprinkler Monitoring & Testing

Any activation of the sprinkler system, by way of signals from flow switches, shall be detected via an Addressable Control Panel/Unit which should be integrated into the fire strategy (Fire Alarms etc) for the particular high rise block and shall be the primary fire detection loop. All monitored flow switches and zone valves including plantroom flow switches shall be connected back to the Addressable Control Panel. Flow switches are to be fitted ‘Per Dwelling’ and all designated areas throughout the building. The panel shall be approved in accordance with the latest British Standard and installed and commissioned by a suitably trained, competent and approved contractor/installer. The system must have the ability to test, record and monitor all fire and fault signals from flow switches and alarm valves.

Activation of the sprinkler system shall transmit an alarm signal from the Addressable Control Panel to the BCC Control Centre who in turn will contact the Local Fire Authority.

## 1.7 Plant & Equipment

### 1.7.1 Town Mains Supply

It should be acknowledged that there is no guarantee that any particular pressure over and above the regulatory obligation will be achieved and that pressure levels that may have been available in the past may not be available in the future. Water suppliers will provide information which is as accurate as possible regarding prevailing mains pressure and any significant variations that they are aware of in order to assist in the design of an automatic sprinkler system. Water supplies may also be affected by a growth in demand and diurnal variation. Each block should be considered individually and an application for supply completed and sent to the local Water Undertaking for their recommendations and approval.

### 1.7.2 CWS Storage Tank

Where applicable and in cases were the local Water Authority cannot guarantee required design mains water pressure, design and install suitable water storage tanks with an effective capacity for the sprinkler installation as required by BS 9251:2014. Information on quantity, type, material, size, construction and access for servicing/maintenance should be provided. The stored volume of water may only be reduced if a proven rate of make-up can be guaranteed. Cold water system storage tanks should have a minimum of a 10 year guarantee.

### 1.7.3 Boosted Cold Water Supply

Where a town main supply is being used as the water supply, the incoming sprinkler supply shall be supplemented with a pressure boosting system. The unit should be WRAS and LPCB approved and BS 9251:2014 and BS EN12845:2015 code compliant. The pressure boosting system must be able to maintain the correct system operating pressure even when mains pressure is unreliable.

### 1.7.4 Sprinkler System Pumps

Design and install pumps in accordance with the provisions of BS 9251:2014 and with due consideration for the site location and conditions.

Only pumps suitable for use in sprinkler systems should be used, installed and operated in accordance with manufacturer’s instructions.

The pumps should be able to supply the sprinkler water at the sprinkler system design pressure and flow requirements at the hydraulically most favourable and unfavourable locations. The selected pumps must be:

* Located in a position that it is unlikely to be affected by a fire or protected in the event of a fire.
* Located where the temperature can be maintained above freezing.
* Protected electrically by suitable fusing. Circuit breakers are not suitable.
* Of sufficient capacity to ensure designed flow rates.
* Operated automatically on demand.
* Continuously rated.
* Constructed from corrosion-resistant material.
* Located in a position such that it is unlikely to be affected by flooding.

Isolating valves should be installed immediately downstream and upstream of the pumps to ensure ease of maintenance and/or replacement.

The electrical supply to the pumps should be installed in such a way as to minimize the risk of power failure by way of a separate fused connection taken after the meter and from the supply side of the fuse box using approved fire-resistant cabling.

Pumps should be installed and considered as duty and stand-by pumps.

Ensure that both pumps deliver, via non-return and isolating valves to a main which feeds the sprinkler control valves.

Appropriately sized test connections, complete with stop valves and readable flow meters between the sprinkler pump delivery main and town main connection.

Control and operation of the pumps should be by way of pressure switches, connected individually to the appropriate feeder main and complete with pressure gauges, isolating valves and a by-pass with check valve as required.

Delivery and suction pipework should be supported to ensure that no load is imposed on the pump sets.

Pumps shall be installed and commissioned fully in accordance with the manufacturer’s recommendations and Commissioning Engineer.

## 1.8 Signs and Notices

A location plate with the wording as follows: **‘Sprinkler Stop Valve’** shall be fixed as near as is practical to the control valve set internally and externally to the plantroom where the fire fighting plant is situated.

A sign shall be fitted close to the main and any subsidiary stop valves with the following wording: **‘Sprinkler Control Valve’**

A nameplate shall be fixed to each system pump bearing the following information:

* Output pressure in bar.
* Rated speed.
* Flow rate in litres per minute at inlet and outlet condition.

All valves and ancillary equipment used for testing and operation of the system shall be appropriately labelled.

## 1.9 Testing and Commissioning

Testing and commissioning should be carried out in accordance with all relevant clauses of BS 9251:2014 and where applicable BS EN 12845

In addition to a full visual inspection, the sprinkler system should be pressurized to a minimum of 8 bar or to 1.5 times the maximum working pressure, whichever is the greater for 1 hour. Should the sprinkler system fail to maintain pressure, a retest should be carried out once the leak/s has been found.

The sprinkler system should also be tested to check that the design flow rate at the design pressure can be achieved at the combined alarm and drain test valve. If the design flow rate and pressure cannot be achieved, the necessary changes to the system should be made and a retest carried out. Not until the design rates are achieved should the system be approved.

An alarm test should also be carried out by opening the test valve and allowing a flow of water to check if the alarm operates as designed. In circumstances where the alarm has been set up to accept remote monitoring, the signal to the monitoring station should be checked.

A certificate of compliance stating that the sprinkler system has been designed, installed and commissioned in accordance with BS 9251:2014 and BS EN 12845 if applicable should be issued by a competent person.

## 1.10 Documentation and Records

All new fire sprinkler installation drawings and associated documentation should have the following details shown:

* The name and address of the property.
* The name, address and contact details for the competent person.
* The name, address and contact details of the Designer.
* The name, address and contact details of the Contract Administrator.
* The completion date of the sprinkler installation.

A log book should be provided to the client on completion and hand-over containing the following.

A signed compliance certificate stating that the installation complies with the relevant British Standard and including any variations agreed with the AHJ together with grounds for the variation:

* The category of sprinkler system and number of sprinklers included in design.
* A general description of the system together with layout drawings and system design pressure and flow rates.
* Results of the commissioning tests.
* A list of components used and catalogue references.
* Details of all stakeholders.
* Details of the incoming water supplies including pressure and flow rate data.
* A programme of proposed future inspections and routine maintenance.
* A plan of instructions in the event of system operation or fault status.
* 24 hour contact details, should assistance be required.

All electrical works in connection with the installation will need to be certificated in accordance with NICEIC. On completion, a signed compliance installation certificate will be required, with periodic electrical installation reports to follow when the installation is routinely tested.

During its handover stage, the contractor has the responsibility to make sure that all relevant commissioning certifications, operations and maintenance manuals are available for exchange.

## 1.11 System Modifications

All system modifications should be carried out wherever possible with no drain down and without any disruption to the system using the ‘Livetap’ pressure drilling system. This work must be carried out using an approved installer with current ‘Livetap’ authorization. In cases where work cannot be carried out using ‘Livetap’, written consent must be obtained from the AHJ and procedures acquired for a planned shutdown put in place.

## 1.12 Maintenance

The sprinkler installation shall be subject to 2no inspections and testing within the first operational twelve months prior to any maintenance/service contract being let.

The system shall be tested by an approved and competent person/s and shall include the following:

Check that all system components are working as designed.

Inspect entire system for leakage.

Check that all alterations/modifications have been carried out satisfactorily and the designed system has not been compromised.

Any alterations to the structure have been accompanied by the required system alterations.

Sprinkler heads are checked for condition and whether still fit for purpose.

Painted or damaged sprinkler heads should be replaced.

All valves should be checked for free movement and that locking devices are fulfilling their purpose.

In order to establish that the system design flow rate and pressure are being met, the test valve should be rendered operational. Records of all pressure and flow rate tests should be kept and information recorded must include:

* Date of test.
* Location and identification of test point.
* Drawing reference.
* Method of test.
* Test pressure.
* Flow rate.
* Results/findings from test.
* Operative signature carrying out the test and Employee.
* Signature of witnessing supervising officer.

Alarm systems should be tested.

All remote monitoring equipment should be tested to determine that they are transmitting and receiving correctly.

## 1.13 Builders work

### 1.13.1 Internal work

#### 1.13.1.1 General

The Contractor shall allow for all making good and minor builders work as required.

Allow, making good to all holes and paintwork where work is taking place and any other items or surfaces which need making good after the works.

Any duct/riser panels removed in order to install pipework and/or fittings should be replaced and secured/sealed to the same standard as found, prior to commencing work.

#### 1.13.1.2 Core drilling

Prior to any drilling being carried out, a thorough survey of the immediate location should be carried out in order to identify existing cable and pipe routes.

Core drilling should be carried out by a fully trained and competent operative using the appropriate tools and Personal Protective Equipment. Use of water in the wet core drilling process shall be kept to a minimum without compromising the wet drilling process. In order to ensure a straight core, anchoring using correct equipment and techniques shall be employed. All equipment used in the core drilling process shall be tested prior to use.

Noise and dust are factors which must be considered during the drilling process and systems put in place to minimize the inconvenience to tenants.

#### 1.13.1.3 Boxing-in

Versa 8 pre-formed plywood flame retardant boxing (Encasement Ltd) should be used to conceal all horizontal sprinkler pipework in all apartments/flats and communal areas (Laundries, Community Rooms etc.) Pipe boxing is to be manufactured from 8mm thick compliant board with a white painted finish and fixed to a framework of softwood battens using screws and plastic white caps. Jointing of running lengths shall be made using joint covers or intumescent mastic and all corners made using pre-formed internal and external dedicated accessories. The sprinkler boxing must be fixed in order that easy access for inspection and routine sprinkler maintenance can be carried out.

When installing timber carcass for pipework boxing-in, due consideration shall be given to the method of fixing in view of the presence of artex ceilings and its asbestos content. Method of fixing battens should be agreed with Contract Administrator prior to work commencing.

Any services including cables, pipework or ventilation systems concealed within the confines of the boxing-in must be accessible for maintenance or replacement by way of removable panels.

#### 1.13.1.4 Fire stopping

Where the sprinkler pipework installation passes through elements of the building construction which have a fire or smoke rating, the openings remaining after passage of the pipework shall be sealed to maintain the degree of fire or smoke resistance of the building element. Such as fire cushions, expanding fire seal etc.

This shall be labelled on both sides of the fire proofing indicating ‘Fire Barrier’

Allowances should be made during progress of the work to provide temporary fire barriers were required up until completion of all works.

Each new fire barrier must be referenced and recorded on a log and handed over to the client on completion of all works. See Section 10.0 Documentation and Records

#### 1.13.1.5 Pump & CWS tank bases (If Necessary)

CWS tank & pump bases shall be constructed from cast in-situ reinforced concrete with a fair faced finish and chamfered on all edges.

### 1.13.2 External Work (If Necessary)

#### 1.13.2.1 CWS Tank Rooms

All materials selected should maximize durability consistent with the architectural or planning requirements for the CWS Tank Room building. External CWS Tank rooms/buildings shall be fully weatherproof, paying particular attention to design and construction details with respect to wind driven rain and storm water run-off. CWS Tank Room buildings shall be designed and constructed such that the potential for vandalism, theft and unauthorized entry is minimized.

Sufficient space shall be provided within buildings to facilitate access to plant & equipment for testing and commissioning, inspection, maintenance and installation/removal activities. A clear working area of not less than 750mm wide shall be provided all around floor-mounted equipment where necessary, for maintenance or replacement of equipment is required and where access for maintenance or redecoration of the building fabric is required.

#### 1.13.2.2 Foundations

Below ground masonry shall be a minimum acceptable standard of high density Cat 1 brickwork (Engineering Class B quality designation).

Where applicable, ducts/openings shall be incorporated within the foundations and plinths to provide access for cables and pipework.

#### 1.13.2.3 Floor

Floors shall be capable of achieving sufficient thermal insulation as necessary to provide an appropriate internal environment.

Floors shall be constructed of a type which is a full bearing monolithic in-situ concrete slab. The quality of floor finish is important and shall comply with the manufacturer’s requirements for the installation and operation of equipment, plant & CWS tank.

Once cured, concrete floors shall be prepared and painted with proprietary anti-slip floor paint system strictly in accordance with manufacturer’s recommendations.

#### 1.13.2.4 Walls

Masonry materials shall be selected to maximize durability consistent with the architectural or planning requirements for the CWS tank room.

External masonry shall be high density face brickwork with an appropriate coating system to ensure that undue moisture penetration is prevented.

Internal masonry shall be thermal blocks. The internal wall shall be constructed in a manner that presents a smooth plumb even surface in order that that essential equipment can be mounted.

Mortar shall be of a grade suitable for the masonry type and should include the use of sulphate resisting cement in below ground works.

Damp proof course shall be incorporated into the brickwork and shall be a proprietary high performance pitch-polymer system.

Brickwork wall ties to cavity walls shall be of stainless steel construction evenly spaced and staggered in alternate courses.

#### 1.13.2.5 Roofs

Tank room roofs shall be designed such that they eliminate or protect against the risk of failure due to vandalism or theft.

Roofs shall be constructed from in-situ reinforced cast concrete with a fair-faced soffit finish, slip joints at wall bearings and treated externally with polysulphide sealant.

A mastic asphalt waterproof system shall be used to protect the concrete roof and shall comprise two-coat roofing grade mastic asphalt and incorporating sheathing felt underlay beneath.

All asphalt laid roof coverings shall receive two coats of solar reflective paint finish.

Proprietary synthetic cover flashings shall be provided to upstands and both chased into joints and appropriately pointed.

Roofs to CWS tank rooms shall be designed with a minimum standard thermal transmittance U value for this type of enclosure.

#### 1.13.2.6 Doors

External doors shall be of robust construction and offer a high degree of security against unauthorized entry. However, If it was to be located in the vicinity/part of an escape route there would be a need for fire protection. As the room could be deemed a switch room, a FD60 would be suffice.

Doors to CWS Tank Rooms located in areas of medium or high risk of vandalism or unauthorized entry shall be proprietary security doors.

All external doors shall be required to open through 180̊ and/or incorporate removable panels over to facilitate the installation/removal of plant.

Doors shall be fully weathered including seals to external perimeter of door frames, cover plates and weathering to lintels over and thresholds below.

The number of doors having external locking to egress Tank Room shall be kept to a minimum consistent with adequate operational use (limit opportunities for unauthorized entry).

Door furniture shall be of a robust heavy-duty construction and corrosion resistant.

#### 1.13.2.7 Wall Finish (Internally)

Dust can be a significant contributory underlying cause of disruptive failure and minimum internal decoration shall be carried out to reduce this risk and includes two-coat proprietary anti-slip paint to floors and two-coat emulsion to masonry walls and concrete ceiling.

#### 1.13.2.8 Lighting & Power

Buildings shall incorporate complete electrical installations for lighting and small power schemes including 230v and 110v.

Low voltage systems will be designed to be compatible with the low voltage installation for the requirements of the plant operation.

Internal lighting shall allow safe movement of personnel and safe operation of equipment.

Internal lighting shall be operated by wall switches positioned adjacent to main doorway.

Internal lighting schemes generally shall be designed such that the positions of all light fittings and associated switches etc. take due cognizance of the locations of all equipment and access/egress routes within the building.

Emergency lighting shall also be provided as per relevant British Standard.

A key test switch shall be installed adjacent to the entrance door.

External lighting shall allow safe access and emergency egress for personnel and safe manoeuvre of plant and equipment.

#### 1.13.2.9 Rainwater Goods

Rainwater goods shall be of PVCu construction or other acceptable robust corrosion resistant system by agreement with the Contract Administrator.

PVCu gutters and downpipes shall be external to the buildings.

Rainwater downpipes may require anti-climb and/or anti-vandal guards, subject to the site specific location and environment.

#### 1.13.2.10 Drainage

Drainage systems shall meet the requirements of and where applicable be approved by relevant local authorities, utility companies and environment agencies.

Surface water drainage systems shall be designed to ensure that there is no flooding of the system and there is no standing water that could impact on the operation, inspection and maintenance of plant & equipment in Tank Room.

Storm water run-off from buildings shall be collected by an appropriate system of rainwater goods that shall positively discharge to storm water drainage in a controlled manner.

#### 1.13.2.11 CWS Tank & Pump Bases (As previous)

CWS tank & pump bases shall be constructed from cast in-situ reinforced concrete with a fair faced finish and chamfered on all edges.

#### 1.13.2.12 CWS Tank Bund

Water containment bunds shall be designed to safely contain a minimum of 125% of the capacity of the water tank.

The bunds shall be built from reinforced concrete, of monolithic construction with integral piers, coated with a proprietary waterproof lining and shall not be less than 225mm thick and no less than 250mm high above finished surface level.

Walls with an upstand of over 500mm shall incorporate integral access and egress steps on each side with anti-slip treads and handrails.

Where construction joints cannot be avoided then these shall incorporate proprietary cast-in water bars, non-absorbent joint filler and flexible sealant.

All bund systems shall be water tested on completion and prior to operational use of CWS tank.

# 2.0 Appendix

## 2.1 Standard Technical Specification

**General**

All equipment and materials to be supplied and erected under this contract shall be new and unused and shall be in accordance with the latest British Standards whether such standards are referenced in this specification or not. The services contractor shall also ensure that all such equipment to be used, erected and supplied by them shall meet with the Health and Safety at Work Act, the Factory Act and the latest CIBSE Guide for Building Services and that the whole of the work shall be carried out in a professional manner to the satisfaction of the M & E Engineers.

The contractor may at his discretion, include in his tender submission for the use of materials and goods of other manufactures but shall not assume their acceptability when tendering, ordering or incorporating the same within the works without the written approval of the Contract Administrator. Any expense incurred by the Contractor due to obtain such approval is to be borne entirely by the Contractor.

The inclusion within this specification of propriety brands, trade names and catalogue references is intended to provide a basis to indicate the type and quality of materials, goods or services required. The Contractor may use alternative materials, goods or services only with the prior express permission or instruction of the Contract Administrator.

Proprietary materials are to be handled and stored strictly in accordance with manufacturer’s instructions and recommendations. Such materials are to be obtained direct from the manufacturers or through their accredited distributors.

Where and to the extent that workmanship is not fully specified, it is to be suitable for the purposes of the works stated in, or reasonably to be inferred from, the Contract in accordance with good building practice and complying with current British Standards or European Community equivalents.

Where existing items are to be removed and replaced, the contractor shall exercise the greatest care to ensure that damage does not occur to adjacent fixtures, fittings or finished surfaces.

All making good is to be executed with materials and workmanship to match, in every respect, the surrounding work and is to be properly bonded thereto.

Any damage caused by negligence shall be made good at the Contractor’s own expense.

The Contractor shall include for all associated equipment necessary for the plant to be erected and operated as described whether any particular item is quoted or not herein. Electrical works shall conform to the 18th Edition of the IEE Wiring Regulations and the Electricity at Work Regulations 1989. Water supplies and installation works shall comply with the latest Water Regulations. The Contractor should also observe safe practices with regard to Fire precautions.

**Omissions**

The services Contractor shall make due provision in his price for any such items such as pipe sets, elbows, fixings etc., which although not indicated in this specification or on the drawings, are necessary for the proper construction of the work and correct operation of the system in accordance with the latest practices to comply fully with the intent of this specification.

Any items shown on the drawings but omitted from the specification or described in the specification but omitted from the drawing shall be included in the works described. The services Contractor shall not omit any part of the works described in the specification or drawings without the written consent of the M & E Engineer. The services Engineer shall be entitled to instruct the Contractor to omit any part of the works and the cost(s) omitted shall be deducted from the contract price.

**Contract Preliminaries**

The main contract preliminaries shall take priority where there is any discrepancy within the preliminaries of these documents.

**Contract Drawings**

The services Contractor shall carry out the work in accordance with the following listed drawings:

Appendices 1 & 2 (Separate Document)

Drawing No:

1. Ground Floor Plan.
2. First to Tenth Floor Plan.
3. Lift Motor Room (Accessed via roof hatch located on 10th Floor).

**Restrictions to Working**

Due allowance shall be made in your tender for the fact that the flats will be occupied through the contract period and that children and the public will be present for the contract period.

All tools shall be protected from the occupiers and any platforms, etc., shall be suitably protected to prevent occupiers hurting themselves.

The protection of materials, tools and the works shall be the responsibility of the services Contractor. All necessary steps shall be taken to protect the occupants during progress of the works.

**Services**

Notification must be given to the respective authorities (gas, water, electricity, etc), where services are exposed or likely to be, arrange for any necessary protection of those services.

**Cost Implications**

All items and matters noted in this specification, which have a cost implication, shall be priced accordingly. Should the tenderer not price any items, it shall be deemed that all costs have been included.

The description of works therein and the rates and prices entered by the tenderer shall be deemed to be the full inclusive value of the work including, but not exclusively, the following:

* Labour and all costs in connection with.
* The supply, delivery and storage of materials.
* Waste and all costs in connection with.
* Plant and all costs in connection with.
* All demolition, cutting, dismantling, removal from site and disposal operations.
* Fixing, erecting and installing or placing of materials or goods in position.
* Temporary works.
* General obligations, liabilities and risks involved in the execution of the works forth or reasonably implied in the documents on which the tender is based.
* Establishment charge and overheads (where not separately priced)

The specification shall apply equally to all parts of the works and at all locations, whether mentioned specifically or not.

Prior to tender submission, the Contractor is required to familiarize himself fully with the surroundings of the site, and allow for the establishment of safe working operations.

**Ordering Materials and Goods**

This specification shall not be used for ordering purposes; the contractor shall ascertain the actual requirements from sizes taken on the works and order accordingly.

**Availability of Materials**

Upon receipt of the order to commence, and subsequently as may be necessary, the contractor shall check upon the availability of the materials and goods described in this specification and shall advise the Contract Administrator immediately of any goods which are unobtainable and an equivalent alternative will be specified.

Unless otherwise stated, the descriptions of materials, goods and workmanship included under any work shall be read as applicable throughout this specification as appropriate.

**Protection of Materials**

All materials shall be adequately protected against deterioration, contamination or damage and shall be read as applicable throughout this specification as appropriate to other sections.

All materials shall be properly protected from weather, particularly from the effects of frost.

**Misuse of Materials and Goods**

No materials or goods of any kind brought on to site for incorporation in the permanent work shall be used for scaffolding or any other purpose.

**Propriety Materials**

Propriety materials and goods shall be used and/or fixed in strict accordance with the manufacturers current printed instructions.

**Certificate of Compliance with British Standards**

If so required, the Contractor shall submit to the Contract Administrator the manufacturer’s certificates of compliance with British Standards with respect to materials.

**Sources of Supply**

Where a choice of type, manufacturer or source of supply of materials is available, this shall not be varied in different parts of the works, without the approval of the Contract Administrator. Written evidence of the source of materials shall, if required, be provided for the Contract Administrator.

**Samples**

The Contractor shall submit samples, as may be required by the Contract Administrator for his/her approval, of any materials and goods proposed to be used in the works. Samples thus submitted shall be a fair indication of the general quality of materials and goods and workmanship represented. When approved they shall be retained on site for comparison purposes and removed when no longer required.

**Approvals**

Approval by the Contract Administrator of products, materials or work specified to be approved or which the Contract Administrator instructions are to be approved shall only apply to the characteristics expressly stated by the Contract Administrator as being:

* Subject to his/her approval.
* To match a sample expressly approved as standard for the purpose.

In all other respects such products, materials or work shall be supplied and executed to comply with all relevant requirements of the contract.

Inspections or any other action by Contract Administrator must not be taken as approval of materials, products or work unless the Contract Administrator so confirms in writing in express terms referring to:

* Date of inspection.
* Part of the work inspected.
* Respects or characteristics which are approved.
* Extent and purpose of the approval.
* Any associated conditions.

**Unsuitable Materials**

Any material condemned as not being up to specified standard or approved sample, or which have deteriorated after approval shall be removed from site immediately upon the instruction.

**Work in Cold Weather**

The rates shall include for the use of suitable approved additives and for taking all necessary special measures to facilitate continuity of work during cold weather in order to complete the works within the contract period. All such additives and measures shall be subject to approval.

The use of calcium chloride shall not be permitted.

Notwithstanding the foregoing, the Contractor shall be responsible for making good at his/her own expense any damage caused by frost.

**Programme and Progress Charts**

The Contractor’s final programming proposals will be carefully examined by the Contract Administrator prior to works commencing.

The Contractor must arrange to carry out the work continuously.

Notwithstanding the Conditions of Contract, the Contract Administrator shall be advised at least two weeks in advance of the estimated start date and sequence of work.

The Contractor is to employ modern management techniques in organizing and in the programming of this contract. The Contractor is to prepare before commencing work, a detailed Programme and Progress Chart showing the entire Contractor’s and the Sub-Contractors trade. Two copies each of the chart are to be sent to the Contract Administrator and one copy is to be displayed on site. The progress of the work as executed is to be indicated weekly on the site copy of the chart.

**Drawings**

Prior to any work commencing on site, design drawings must be sent to the Client Administrator for consultation and approval. Once approved, working drawings must be produced which show pipe runs, position of sprinkler heads, positions of structural beams and columns together with all proposed pipework penetrations through fire barriers.

Drawings must take into account all existing electrical cable routes and other services including cold, hot, heating and gas pipework.

Consultation with the Structural Engineer must first be carried out if pipework routes pass through structural beams or where drilling is carried out which could compromise the structural integrity.

On completion of all work, ‘As-Fitted’ drawings must be provided as part of the Documentation and Records submission. Any concealment of cables and/or pipework in the boxing-in must be shown on the As-Fitted drawings.

**Removing Rubbish, Dust Control and Site Clearance**

The Contractor shall clear away all material arising from the works as it accumulates and shall carry out the works in a clean and orderly manner. The Contractor shall comply with the Environmental Protection Act 1990 and all transport/plant used for the transfer of waste from site shall be registered to carry waste by the Waste Regulation Authority.

Skips shall be cleared daily or be lockable. The location of skips and methods of accumulating and disposing of rubbish shall be agreed with the Contract Administrator.

The Contractor shall be responsible for removing any rubbish dumped in or adjacent to the skips.

## 2.2 Pre-Construction Information

**Introduction**

This documenthas been drawn up in accordance with the Construction (Design and Management) Regulations 2015 and the Guidance L153

For generic Health and Safety issues, the Contractor should refer to Bristol City Council’s Code of Practice for Health and Safety Standards for Construction Contractors and Related Activities (1996)

**Site Location**

Butler House

Summerhill Road

St George

Bristol

BS5 8HQ

**Proposed Works**

Butler House is an 11 storey block of flats in the St George area of

Bristol. This is made up from a ground floor, plus 10 additional floors. The proposed work is:

* The installation of a fire sprinkler system to all residential flats and communal areas (as specified) and incl. distribution pipework, pumps, CWS storage tanks, valves, controls, alarms and sprinkler heads.
* System pressure testing and commissioning.
* Boxing in of all pipework in residential flats and general making good.
* Asbestos survey, testing and removal.
* Fire stopping at all points of pipework penetration.

This list is by no means exhaustive and further works may be added or deleted as the work progresses.

The Principal Contractor shall, upon award of the contract, forward to the Principal Designer, site specific Risk Assessments and Method Statements for approval and prior to commencement of ANY works.

**Timescale**

Commencement Date: November 2020

Completion Date: March 2021

Anticipated Duration: 4 Months

Workplace (Health Safety and Welfare) Regulations

The site and structures will only be used for construction purposes for this project and no other work.

**Project Team**

**Client**

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TBA

**Contract Administration**

TBA

**Principle Contractor**

TBA

**Principle Designer**

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**Site Manager**

TBA

**Contracts Manager**

TBA

**Sub-Contractor**

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**Tenant Liaison Officer**

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**Emergency/Out of Hours Contract**

TBA

**Senior Housing Advisors**

TBA

**Extent and Location of Existing Plans and Records**

The following information can be found in the Appendices to this document:

* Asbestos Information
* Site Location Plans

Copies of all this information are kept in a displayed file at:

Bristol City Council

M & E Section

The Bungalow

Brislington Depot

Sandy Park Road

Brislington

Bristol

BS4 3NZ

## 2.3 Client’s Considerations and Management Requirements

**Planning and Managing Construction Works**

**Health and Safety Executive ACOP’S**

The Principal Contractor is expected to observe and meet the requirements of the Health and Safety Executives Approved Codes of Practice for Health & Safety Standards for Construction Contractors and Related Activities.

**Time and Resources**

The Client is committed to successfully completing all the proposed works safely and requires the Principal Contractor to allow sufficient time and resources to achieve this goal.

**Construction Phase Plan**

The Principal Contractor is responsible for the production and maintenance of a Construction Phase Plan. This document addresses the key health and safety issues for the project and should set out the organisation and arrangements that have been put in place to manage risk and to co-ordinate the works on site. Items will include the site rules, control of access to the site, site Induction, training and site information. NB. Work on site will not be permitted to commence until the initial Construction Phase Plan has been accepted by the Client. The Plan must be kept on site, in document format, with additions made as necessary by the progression of the works. At completion of the works, all relevant information must be passed to the Principal Designer for inclusion in the Health and Safety File.

**Risk Assessments and Method Statements (RAMS)**

The Principal Contractor shall produce these before works start at each stage of the project in order to address issues specific to those works, materials to be used and their application. Where appropriate the RAMS must include COSHH (Control of Substances Hazardous to Health) assessments and the method of application of materials, their life cycle, future removal and disposal/recycling. At completion of the works all relevant information must be passed to the Principal Designer for inclusion in the Health and Safety File.

**Site Rules**

The Principal Contractor must display legible copies of the Site Rules and the most up-to-date information notified to HSE, at the site, in locations where people working on the site can read them. Furthermore, the Principal Contractor will disseminate ALL pertinent information to ALL interested personnel as soon as it becomes known and/or necessary to do so.

**Waste Materials**

All waste and debris arising from the works must be contained within the site area. All waste material stored and not removed immediately from the site must be protected within lockable containers. The Principal Contractor must submit Method Statements for approval by the Client for the disposal of such waste and for the control of dust and other material nuisances arising from work.

**Health and Safety Goals**

The Health and Safety objectives of this project and all affiliated works being undertaken concurrently shall consist of: no deaths, no injuries, nor dangerous occurrences or diseases as defined in schedules 1,2 & 3 of The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR 2013).

**Site Safety Officer**

The Principal Contractor shall appoint a designated Site Safety Officer for the duration of the project. The appointee shall be suitably experienced, competent & qualified to undertake the role.

## 2.5 Communication and Liaison

**Meetings**

Meetings must be held between the Principal Contractor, Designer,

Contract Administrator and Principal Designer to ensure that all aspects of Health & Safety issues regarding works on site and amendments to the designs are adequately addressed and the relevant information placed in the Health & Safety file. The frequency of the meetings, are to be arranged to the satisfaction of the Principal Designer and Client but at least once a month. However, any such meetings may be arranged at the request of any stakeholder with an interest in the works on site.

**Liaison**

Liaison between relevant parties to be through circulated reports, minutes of meetings and e-mails, where appropriate. All parties must make arrangements for easy contact during the project and to make alternative arrangements during periods of absence.

**Customer Liaison Officer**

Prior to commencing work on site, tenant consultation meetings shall be arranged with all tenants outlining all aspects of the works which may/will affect them. The meetings shall be attend by CLO’S from both the Contractor and Client (BCC), Housing Officer, Caretaking, Contractors Representative (Contracts Manager) and a Client Engineer (BCC) and all tenants affected by the work at each stage.

Tenants who do not attend shall be notified of all agreed works and where applicable, provided with a summary of subjects discussed from the meetings.

It may be prudent to also visit any tenants that cannot make meetings with updates.

Liaison meetings shall be held each week for the first month of the contract and fortnightly thereafter.

All vulnerable and elderly residents shall be identified before any work starts on site and any residents who are at work during the day.

It will be the responsibility of the Customer Liaison Officers to notify all tenants of the proposed work by letter and posters fixed in communal areas including laundries, lifts, community rooms etc. Pre & post inspections of each flat shall be carried out and a record kept of conversations with tenants by way of a signed agreement or letter. This may include a statement regarding relocating furniture while work is being carried out and an agreement to re-instate in former position on completion of work.

Condition of furniture, decorations and any personal effects of value should also be considered at this stage. Records must be kept of all meetings and used as reference when considering work, procedures and processes in future blocks.

Tenants shall be provided with laminated guides on the do’s and dont’s (facts & myths) surrounding sprinkler installations.

## 2.6 Security of the Site

**Site Hoarding**

The Principal Contractor must provide sufficient security to ensure that the sites and compound, building work and storage areas are not left vulnerable to theft, trespass or vandalism and all areas are secure at the end of the day.

**Compound**

The Principal Contractor may construct a temporary secure compound on site after the size and location have been agreed with the client. The compound may contain the site office, the welfare facilities for operatives and secure material storage. It may be possible to use existing site services and facilities after consultation and agreement with the Client.

**Access**

Designed scaffolding and/or access platforms must be protected or dismantled to prevent unauthorized access at all times of the day. Particular attention must be given to securing all scaffolding/works access at the end of each working day, over weekends and Public and Bank Holidays.

**Contractor Contract Information**

Information boards displaying contact names, out-of-hours and emergency telephone numbers of the Principal Contractors team and the Scaffolding contractors must be prominently attached to the scaffold. The boards must be visible from ground level at all times of the day and should be set above pedestrian entrances to the building. The Principal Contractor must also ensure that this information is passed for inclusion on the Scaffolding Register at the appropriate BCC office,

BCC Call-Out Centre and also registered on BCC computerised information system.

**Unauthorised Access**

The Principal Contractor must take all reasonable steps to prevent unauthorized access to the site, work or storage areas at all times. All operatives must carry identification.

**Criminal Records Bureau**

The Principal Contactor must ensure that inappropriate persons are excluded from the site and, where possible, up-to-date CRB checks on personnel have been carried out.

**Workings Hours**

The Principal Contractor and sub-contractors are only permitted to work on site Monday – Friday 8.00am until 5.00pm unless otherwise agreed with the Client. The playing of radios on site is not permitted.

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## 2.7 Welfare Provisions

**Suitable Provisions**

Suitable welfare facilities must be provided from the start and maintained throughout the construction phase. NB Work will not be permitted to start until the Welfare Facilities have been approved by the client. It may be possible to use existing on-site facilities, subject to approval by the Client.

**Accident Report Book**

The Principal Contractor must keep and maintain an Accident Report Book for the site, recording any incident involving works on site and staff, site operatives, tenants or members of the public, either in or out of normal working hours.

## 2.8 Health and Safety of Client’s Employees, Personnel, Occupiers & Visitors to site

**Site Induction**

Site inductions shall be mandatory with ALL persons entering the site subject to a Health and Safety induction process.

**Induction/Training**

All workers on the site shall receive Site Inductions and any further information and training necessary to undertake the work/task. All workers must wear appropriate Personal Protective Equipment (PPE).

**Traffic Management Plan**

The Principal Contractor must ensure that emergency vehicles such as ambulances and fire tenders have unobstructed 24 hour access to each property, Unobstructed access must also be ensured during working hours for refuse collection and essential deliveries. Vehicular Access & Deliveries must not impede, as far as is reasonably practicable, access by residents, visitors & carers alike. The Principal Contractor will compile a ‘site specific’ Traffic Management Plan as part of the Construction Phase Health and Safety Plan.

**Fire Precautions and Fire Risk Assessment**

The Principal Contractor must prepare a Fire Plan and method statement before any work starts on site. The Fire Plan and method statement must be included in the Construction Phase Plan for approval by the Client. The Principal Contractor must take all reasonable precautions to avoid the outbreak of fire. No fires will be permitted on site at any time. No smoking will be permitted on site. Special attention to first floor fire exits for occupants when scaffold is being designed so that windows are not obstructed. All work to Bristol City Council properties must take account of the existing fire risk assessment. Any works that will alter the existing assessment will require a new risk assessment to be carried out by the Principal Contractor and agreed with the Local Fire Authority.

**Emergency Procedures and Means of Escape**

The Principal Contractor must prepare a written plan and procedures for leaving the site and work areas in case of fire or other emergency. The emergency procedures must also be included in the Site Rules.

**No-Go Areas/Authorisation for Project Personnel**

The Principal Contractor shall ensure that areas not part of the works or welfare provision are out of bounds to ALL staff and affiliated personnel. The Principal Contractor is further reminded that adjacent properties may be occupied during the works and as such ALL relevant permissions shall be obtained prior to entering sites not directly associated to the works being undertaken.

**On Street Parking**

Butler House is off Summerhill Road and is typical of all BCC Sites in that it has a limited number of on & off street parking which may include disabled bays and as a consequence, contractors are expected not to create parking issues and must endeavour not to cause obstructions to residents and visitors alike.

## 2.9 Wider Health and Safety Considerations

**Adjacent Properties**

Particular attention shall be given to the adjacent properties, as these may be fully occupied during the proposed works. The Principal Contractor must ensure that the following issues are addressed to the satisfaction of the Client and included in the preparation of the Construction Phase Plan and Site Rules.

**Construction Phase Plan and Site Rules**

**Safe Access**

The Principal Contractor shall ensure the provision of safe access for the occupants and visitors of each site and to those of the adjacent properties at all times during the Principal Contractor’s possession of the site and until full completion of the works.

**Lighting and Signage**

Pedestrian access to each site consists of clearly defined access roads and footways, therefore the Principal Contractor will where necessary/practicable, provide clearly printed and graphic hazard warning signs relating to the works on site, on the pedestrian footways around the site, on the works compound and any other works-related enclosures with suitable illumination and signage where necessary.

**Disability and Equality Act 2010**

The Principal Contractor must ensure where necessary/practicable that safe access meets the requirements of the Disability and the Equality Act 2010, particularly with regard to wheelchair users and/or people with hearing or visual impairments where reasonably practicable.

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## 2.10 Environmental Restrictions & Existing On-Site Risks

**Safety Hazards**

**Vehicles**

Each site will be subject to high volumes of vehicular and pedestrian traffic with restricted on street parking and traffic calming measures, therefore the contractor must exercise caution at all times paying particular regard to the needs of the elderly residents, visitors and carers.

**Banksman**

The Principal Contractor will provide a Banksman when necessary to control vehicular activity and deliveries to and from site and all vehicular movement associated with the works accessing each site.

**Existing Surfaces**

Reinstatement of surfaces: The Principal Contractor must provide a photographic record of the condition of all ground surfaces prior to taking possession of the site and provide full reinstatement of all damaged surfaces at completion. Checker plates must be provided to protect kerbstones and finishes and to prevent tripping hazards.

**Existing Environment**

The surrounding area to Butler House is primarily residential with a single entrance/exit point to the site from Bethel Road. The area around the site will have high volumes of vehicular traffic and moderate volumes of pedestrian traffic. The Principal Contractor must make themselves aware of the surrounding area when producing a traffic management plan.

The Principal Contractor shall mitigate, as far as reasonably practicable,

ALL risks associated with the works paying particular regard to the aforementioned. It may be advisable to arrange a visit to the local school to introduce the children to the danger of construction. The Traffic Management Plans shall detail specifically how the Principal Contractor proposes to ensure compliance on a site-by-site (Specific) basis.

**Adjacent Land**

Each site comprises a mix of residential properties.

**Existing Services**

Water supplies, sewage, gas, electricity and telecommunications services are all present at or near the site. The location of these services can be supplied by the service providers, but the Principal Contractor must proceed with extreme caution when operating or excavating in the locations shown and should assume that the information is indicative, rather than precise.

Where records exist concerning previous structural alterations, fire damage or ground shrinkage, Bristol City Council will endeavour to forward all significant information to the Principal Contractor.

## 2.11 Health Hazards

**Asbestos**

Materials containing asbestos have been found in the textured coatings to ceilings, floor tiles/adhesive, toilet cisterns etc. Please note however, with buildings of this type and age it is possible that asbestos may be present in other areas, which have not been either uncovered or investigated and the Principal Contractor must not only proceed with caution but also satisfy themselves that all deleterious waste to be disposed of has been tested by an Approved Licensed Contractor.

**Bristol City Council Asbestos Policy**

BCC’s policy on asbestos removal or encapsulation must be followed and the Contractor is responsible for ensuring compliance with this and all relevant legislation regarding asbestos and other deleterious materials.

**Existing Known Materials**

Other existing known materials in the structure are consistent with buildings of this type and are known to contain silica, therefore appropriate RPE must be worn when working with the following materials to reduce exposure below the maximum exposure level (MEL) as far as is reasonably practicable:

* Steel reinforced concrete framework
* No Fines concrete
* Brickwork
* Cement mortar
* Paving slabs
* Concrete/curb edgings
* General clearing and removing rubble

Note: This list is by no means exhaustive

**Residential Impact Consideration (Nuisance)**

The Principal Contractor is required to address all potential/likelihood of nuisance in the Construction Phase Health and Safety Plan, paying particular attention to the residents of each site and adjacent properties.

**Noise**

The Principal Contractor shall ensure compliance with the guidelines of the Code of Practice for Noise Control on construction sites.

**Dust**

The Principal Contractor shall ensure dust concentration levels are kept to a minimum at all times even when the site is unoccupied i.e. Evenings, Weekends & Bank Holidays.

**Pollution, Mud and Dirt**

The Principal Contractor shall employ measures to avoid the creation of pollution by site operations with particular attention to mud/dirt being carried on to the pavements, access roads and the cleaning thereof.