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ADDING VALUE TO CONSTRUCTION

EMPLOYER'S REQUIREMENTS

for

MECHANICAL & ELECTRICAL SERVICES
INSTALLATIONS PERTAINING TO RENOVATION WORKS

at

THE UNIONIST CLUB
67 MORRAB ROAD
PENZANCE
CORNWALL
TR18 2QT

for

EMILY NIXON JEWELLERY LTD

REF 1PZ1362/MEERS

REVISION HISTORY

REVISION	DATE	REVISION DETAILS
-	7th November 2024	Tender Issue

TABLE OF CONTENTS

PART 1 - GENERAL REQUIREMENTS

1.1 The Works

1.1.1 The works comprise the mechanical and electrical installations relating to the proposed renovation and conversion works of the Unionist Club, 67 Morrab Road.

1.2 Design Responsibilities

1.2.1 The Contractor shall be responsible for the adoption, development and completion of the design for the whole of the Works as described in these Employer's Requirements and as indicated within the tender drawings and specification notes prepared by PMR Architecture Ltd.

1.2.2 The Contractor shall be responsible for analysing the Employer's Requirements made available by the Employer and satisfy themselves as to the quality, accuracy and completeness to ensure that sufficient information is provided to develop the constructional aspects of the design, produce working drawings, details and undertake the construction of the Works in accordance with the Employer's Requirements.

1.2.3 Any reference to the design which the Contractor has prepared or shall prepare or issue for the Works shall include any design which the Contractor has caused or shall cause to be prepared or issued by others, including any design in the Work Information which the Contractor is responsible.

1.2.4 The Contractor shall provide information about aspects of the design that could create significant risk during construction and subsequent maintenance. This information shall be presented as notes on drawings and highlighted to the Contract Administrator prior to commencing with the Works.

1.2.5 Any changes to the details of the Employer's Requirements, Contract Drawings or sketches which may be required to meet any of the foregoing requirements must first be submitted for comment to the Contract Administrator.

1.2.6 Nothing contained in the Employer's Requirements and attached drawings shall affect the aforementioned responsibilities of the Contractor.

1.2.7 Where there is a difference between an Employer's Requirement and a Contractor detail, the Employer's Requirement shall take precedence; unless a specific agreement has been obtained in writing from the Contract Administrator.

1.2.8 Any costs incurred by the Contractor in such changes shall be deemed to be included in the Contract Sum

1.2.9 Insofar as the Contractor is responsible for the design of the Works in accordance with the Employer's Requirements, provided by the Employer (including any further design which the Contractor is to carry out as a result of an Employer's Agent's Instruction), the Contractor warrants and undertakes to the Employer that:

a) He has exercised and will continue to exercise all the skill, care, diligence and best up-to-date practice to be expected of a properly qualified and competent Contractor experienced in designing and carrying out work of a similar scope, nature and size to the Works;

b) The Works will, when completed, comply with the Employer's Design and Technical Requirements provided within these Employer's Requirements for the Contractor's Design to be reasonably inferred there from;

c) The Works have been or will be designed or specified using best up-to-date practice and to standards consistent with the intended use of the Works;

d) The Works comprise or will comprise only materials, plant and goods which are new and of sound and merchantable quality and all workmanship, manufacture and/or fabrication will be to standards consistent with the intended use of the Works;

e) The Works will, when completed, comply with Planning, Building Regulations and all other Statutory Requirements.

1.3 Samples, Approvals and Testing

1.3.1 The Contractor shall supply samples of the following materials and workmanship to the Contract Administrator and Employer prior to carrying out the Works:

I. Power and lighting faceplates
II. Recessed floor socket faceplates

1.3.2 Where approval of products or materials is specified submit samples or other evidence of suitability. Do not confirm orders or use materials until approval has been obtained. Retain approved samples on site for comparison with products and materials used in the works. Remove when no longer required.

1.3.3 All goods and materials used or supplied and all workmanship shall comply with the relevant British Standard Code of Practice. Remove samples which are not part of the finished works when no longer required.

1.3.4 All mechanical and electrical services to have final test and commissioning carried out so that they are in full working order at practical completion. All tests to be as required by the Contract Administrator or the statutory authority concerned.

1.4 Health and Safety & CDM Regulations

1.4.1 The contractor shall comply fully with all Health and Safety requirements under the draft of the Health and Safety legislation 1974, as part of the construction process.

1.4.2 The Contractor is to co-operate with the Principal Designer in the preparation of all information required in connection with the Construction (Design and Management) Regulations 2015, as and when requested to do so, and to submit his responses for inclusion within the Health and Safety Plan for the whole project.

1.5 Defects Liability

1.5.1 Allow for making good any defects, or other faults which may appear within the Defects Liability Period. The Defects Liability Period is to be twelve months from the date of practical completion. During that period the Contractor is to be responsible for the remedying of any defects when called upon to do so.

1.5.2 Should it become necessary for the Contractor to replace or renew a defective portion of the works, the twelve months liability period for that work is to run from the date of such a replacement or renewal.

1.6 Schedule of Rates

1.6.1 Within 5 days of request by the Contract Administrator the contractor is to provide a priced and detailed Schedule of Rates, itemised and totalled to accord with the stated Tender Sum. Each service shall be priced separately. The rates used in the schedule are to include labour, materials and on cost elements. Should any variations occur during the progress of the works, which cannot be priced from the Schedule of Rates, work is to be priced upon materials and labour basis. The contractor is to confirm in his Schedule of Rates, his current labour rates and the percentage on-costs for labour and materials.

1.7 Fabrication/Installation Drawings & As-Installed/Record Drawings

1.7.1 The Contractor shall co-ordinate the Mechanical and Electrical Services and agree principles with all parties concerned.

1.7.2 The Contractor shall provide schematic drawings, detailed drawings, coordination drawings and fabrication drawings, installation and wiring drawings as necessary. In addition to the above the Contractor should provide builders work information where required, manufacturer's drawings shall be included within the proposals, and should be certified drawings.

1.7.3 Control logic diagrams, switchgear starter and control instrumentation and panel drawings, as installed drawings and record drawings. As-Installed / Record drawings will form part of the O & M Manuals and should be provided to form 2 sets of O & M Manuals. An electronic format set of such details should also be provided via memory stick, CD or similar.

1.7.4 Where pertinent, the Contractor shall also provide plantroom schedules and schematics, as part of a laminated set, which shall be mounted within the plantroom itself (valve schedule).

1.7.5 Generally, the Contractor shall provide drawings for construction in form and number as required and shall provide additional copies of drawings as may be reasonably required by the employer.

1.8 O & M Manuals

1.8.1 A full set of O & M Manuals shall be provided by the Contractor which will include a full set of as installed drawings, for all systems.

1.8.2 The Contractor shall provide maintenance instructions and guarantees and all technical literature associated with the project. Copies of this ledger shall be kept on site and readily accessible for reference by all supervisory and maintenance personnel. The O & M Manuals shall be presented in a 4 clip ring binder, or similar, which shall be clearly marked indicating the nature of the contract, the date, the works that took place, and all other details of the project. All drawings shall be separately included in plastic sachets for easy retrieval. These documents shall form part of the Health and Safety File as required under the CDM Regulations 2015.

1.9 Collateral Warranties

1.9.1 Contractors/subcontractors and specialists carrying out design Works are to enter into a Collateral Warranty in favour of the Employer under the Form of Warranty contained in Appendix A. Professional Indemnity insurance with a minimum cover level of £500,000 is required to be held by all parties entering into a Collateral Warranty.

PART 2 – TECHNICAL REQUIREMENTS

2.1 Mechanical Installation

2.1.1 Heat Source

All heating to be via overhead air conditioning units or panel radiators as noted upon drawings.

2.1.2 Space Heating

Space heating is to be via overhead air conditioning units or electric panel radiators throughout. Radiators to be as www.ecolec.co.uk/products/Radiant-Panels-Without-Vents/ with radiators to be painted in matt Ral 9010

The heating system shall be designed to maintain room temperatures of 21˚C when the outside temperature is minus 3 degrees Celsius:

Radiators positions should be as indicated upon the tender drawings and should be securely fixed with brackets.

Bathroom is to be provided with a chrome electric towel rail.

2.1.3 Water Supply

Design

Water service design shall be in accordance with statutory requirements and the relevant Building Regulations and based on the pressures and flow rates supplied from the incoming main. All dwellings should be designed to achieve a water consumption rate of maximum 125 litres/person/day.

Meters

Water supplies for the client areas are to be via a single installation and be individually metered. A further meter is to be installed for the future café water supply to allow for landlord metering.

Stop Taps

At the point of entry to each floor the water supplies are to be fitted with 'Sure stop' stop taps. These must be in a convenient and readily accessible position.

Incoming Main To Kitchen And Workshop Sinks

Hot and cold tails are to be installed to the kitchenette and kitchen areas. Pipework to workshop sinks is to be in copper.

2.1.4 Hot & Cold Water Installations

Design

Hot and cold water services shall be provided in accordance with statutory requirements and the relevant Building Regulations and be adequate for the likely demand and consumption.

Services To Be Plumbed In Copper Tubing

All hot and cold water services are to be plumbed in copper tubing to BS 2871: Part 1: (1971) Table X. Pipe fittings must be of the capillary or compression type complying with BS 864: Part 2 (1983). Where capillary joints are being made, care must be taken to ensure that the heat required does not damage adjoining areas. Drinking water supplies must be soldered using lead free solder. All pipework is to be clear of all waste solder and flux.

The use of microbore or flexible sleeved pipework within timber or screeded floors or behind drylining is not permitted.

Standard Of Installation

All pipes are to be installed neatly, particularly where visible.

All horizontal runs of pipework, wastes etc in bathrooms and WCs are to be boxed in.

All ducts or pipework with ducts shall be insulated.

Draining Down

Every installation shall be capable of being drained down. Isolating valves shall be provided at all sanitary appliances and to every tap.

Hot & Cold Water Supplies for Appliances

Plumbing is to be provided for all sanitaryware within bathrooms and WCs as indicated by the layout drawings of PMR Architecture.

Plumbing is to be provided for all kitchen appliances, to include fridge freezer and dishwasher.

Water heating is to be via direct instantaneous heating at each hot water source.

2.1.5 Soil & Waste Systems

Design Of Pipes And Systems

Internal soil and waste systems shall be provided in accordance with statutory requirements and the relevant Building Regulations and be adequate for the likely demand.

All bends in pipes are to have minimum 75mm radius. All right angle bends to have access points. All plumbing goods to in uPVC to comply with BS 4514-1978 and installed in accordance with BS 5572-1978 and Section 1 of Part H of the Building Regulations. Systems must be designed in such a manner that unsightly runs are avoided both internally and externally. Rodding access to be provided at all changes in direction of pipe runs. Soil vent pipes and stub stacks are to be 110mm in diameter. Stub stacks are to be fitted with AAV's 900mm above finished floor level to BS 5415-1983. All internal pipework runs shall be boxed in where otherwise visible. External pipes are to be the same colour as the rainwater pipes.

Wastes for Appliances

Wastes are to be provided for all sanitaryware in bathrooms and WCs; as indicated on the layout drawings by PMR Architecture.

Plumbing is to be provided for all kitchen appliances, comprising, fridge freezer and dishwasher. These appliances are to have separate wastes to the sink.

Maintenance Of Traps And Waste Fittings

Provision must be made for adequate maintenance and the clearing of obstructions from all traps, and waste fittings.

2.1.6 Testing

Test the whole of the heating, hot & cold water and waste disposal installations, leaving in good working order and provide satisfactory test certificates in accordance with current Regulations.

2.1.7 Builder's Work In Connection

Carry out all necessary builder's work in connection with the gas, heating, hot & cold water and waste disposal installations. Including, but not limited to, all boxing in, chasing, notches, cutting holes and the like.

The contractor shall also ensure that fire protection is provided for all M&E services installations with fire protection ratings to accord with separating structures

2.2 Electrical Installation

2.2.1 General

The whole of the electrical installations shall be carried out in accordance with current I.E.E Regulations and comply with BS 7671 and tested prior to handover. The Electrical Sub-contractor shall be on the roll of the National Inspection Council for Electrical Installation Contracting or a member of the Electrical Contractors Association.

The installations shall cover both Landlord installations and client area installations and must also comply with all relevant Statutory Regulations and all

materials, equipment or work employed throughout the installation shall comply with the relevant British Standard Specifications and Codes of Practice.

The appointed Contractor will be required to serve the relevant notices to the electricity company for fixing meters and connecting to their mains.

Indicative power and lighting positions are indicated on R A Design Ltd architectural drawing 1693/17. Such locations, particularly with respect to kitchen areas, are subject to change and are not guaranteed to comply with these requirements throughout.

Earthing

Earthing throughout the installation shall be carried out in accordance with the requirements of the I.E.E. Wiring Regulations and BS 7671:2001. Allow for bonding all pipework, radiators and sanitaryware where applicable.

Meters

It is expected that the existing single phase meter within the shop will be utilised for the landlord and client areas.

Location of Consumer Units

Consumer units are to be installed for each floor and cover all installations upon the respective floor. Circuit breakers with an earth leakage control are to be provided and located for easy access where possible in a cupboard. The consumer units shall include 2nr spare fuseways. All boards should be clearly labelled to identify its serving point.

2.2.2 **Small Power**

Isolation Switches For Appliances

Each kitchen and kitchenette area is to be provided with, as a minimum, the following power provisions for appliances and shall have isolation switches suitably positioned and labelled (by engraving or similar) above work surfaces with socket outlets at the appliance position below.

- Hob (Induction)
- Oven
- Extraction hood
- Worktop lighting
- Dishwasher
- Fridge freezer

Unless switches are grouped in a grid switch, they must be located adjacent, or near to, the respective device and fully accessible at all times.

Installation of Kitchen Appliances supplied by others

The contractor is to allow for wiring in all integrated/built in kitchen appliances and worktop lighting.

Provision And Location Of Sockets

Electric switched socket outlets are to be provided in the locations as indicated upon the layout drawings and room data sheets of PMR Architecture. Sockets are to be of galvanised industrial design.

Wiring

All wiring is to be within surface mounted galvanised conduit.

Approved Range Of Socket Outlets And Switches

All socket outlets and switches should be industrial galvanised. Accessories shall incorporate the BS Kitemark, switched and unswitched socket-outlets to BS1363 (1984), switches to BS 3676, cooker control units to BS4177 (1992) and electrical accessories to BS5733 (1995).

Mechanical Services Wiring

The Electrical Contractor shall undertake all wiring in connection with the mechanical services installation. The electrical contractor shall liaise with the mechanical contractor to design, supply and install all mechanical services wiring.

Each plant item shall have a dedicated isolator / fused connection unit to enable safe isolation.

2.2.3 Lighting

Internal Lighting

The contractor shall complete the design of the lighting system to meet the minimum lux levels required under the current building regulations. This is to include all office, workspace and communal parts; including general landlords lighting and emergency lighting.

A lighting point is to be provided inside any understair cupboards and within the roof spaces where applicable. Where applicable, the roof space light is to be controlled by a neon indicated switch installed on the landing.

Light Fittings

All light fittings are to be in accordance with those indicated upon the PMR Architecture electrical layouts. Providing suitable fire rated and moisture resistant fittings where required to WC and bathroom areas.

Emergency Lighting / Signage

Emergency escape lighting to be installed to BS 5266 Part1 2005. All escape signage to BS5499 Part1 2002.

2.2.4 **Intruder Alarm System**

Grade 3 Intruder Alarm system to be installed covering all building entrances, client areas of the ground floor and first and second floor areas. The Alarm system is to be zoned to allow for individual rooms to remain alarmed whilst others are in use.

2.2.5 **Telephone & Data**

Outlet points

Each floor is to be provided with telephone and Cat 6 data outlet points (network sockets) in the offices and each main workshops. The telephone master socket is to be fitted and the extensions are to be complete.

2.2.6 **Smoke & Heat Detectors & Sprinkler Systems**

Smoke Detectors and Heat Detectors

Smoke and heat detectors shall be installed in accordance with the current Building Regulations And the Collins fire strategy. These are to be mains powered, connected to a separate fused circuit at distribution board, with rechargeable battery back-up.

Automatic fire detection system to be installed in accordance with BS 5839.

2.2.7 **Ventilation**

Mechanical Ventilation

Ventilation systems are to be provided in accordance with the Saxty specifications appended to this document.

Mechanical Ventilation to Bathroom/WC

Mechanical extract ventilation is to be provided to all bathrooms and WCs.

The extract fans are to provide continuous trickle ventilation on 'silent running' with a manual 'boost' facility. Their operation is to be independent of the room lighting. The extract capacity of the fans is to comply with current Building Regulations and shall provide a minimum of 15l/s duty at source.

2.2.8 **Lift**

Commercial screw driven, self-supporting, passenger lift, Invalift type MC2000, to serve all floors of the building.

2.2.8 **Testing**

Test the whole of the electrical installations, leaving in good working order and provide satisfactory test certificates in accordance with current I.E.E Regulations.

2.29 Builder's Work In Connection & Fire Protection

Carry out all necessary builder's work in connection with the electrical installations. Including, but not limited to, all boxing in, chasing, notches, cutting holes and the like.

The contractor shall also ensure that fire protection is provided for all M&E services installations with fire protection ratings to accord with separating structures

APPENDIX A

PMR ARCHITECTURE INDICATIVE SERVICES LAYOUTS

NOTES:
All sizes to be verified on site.
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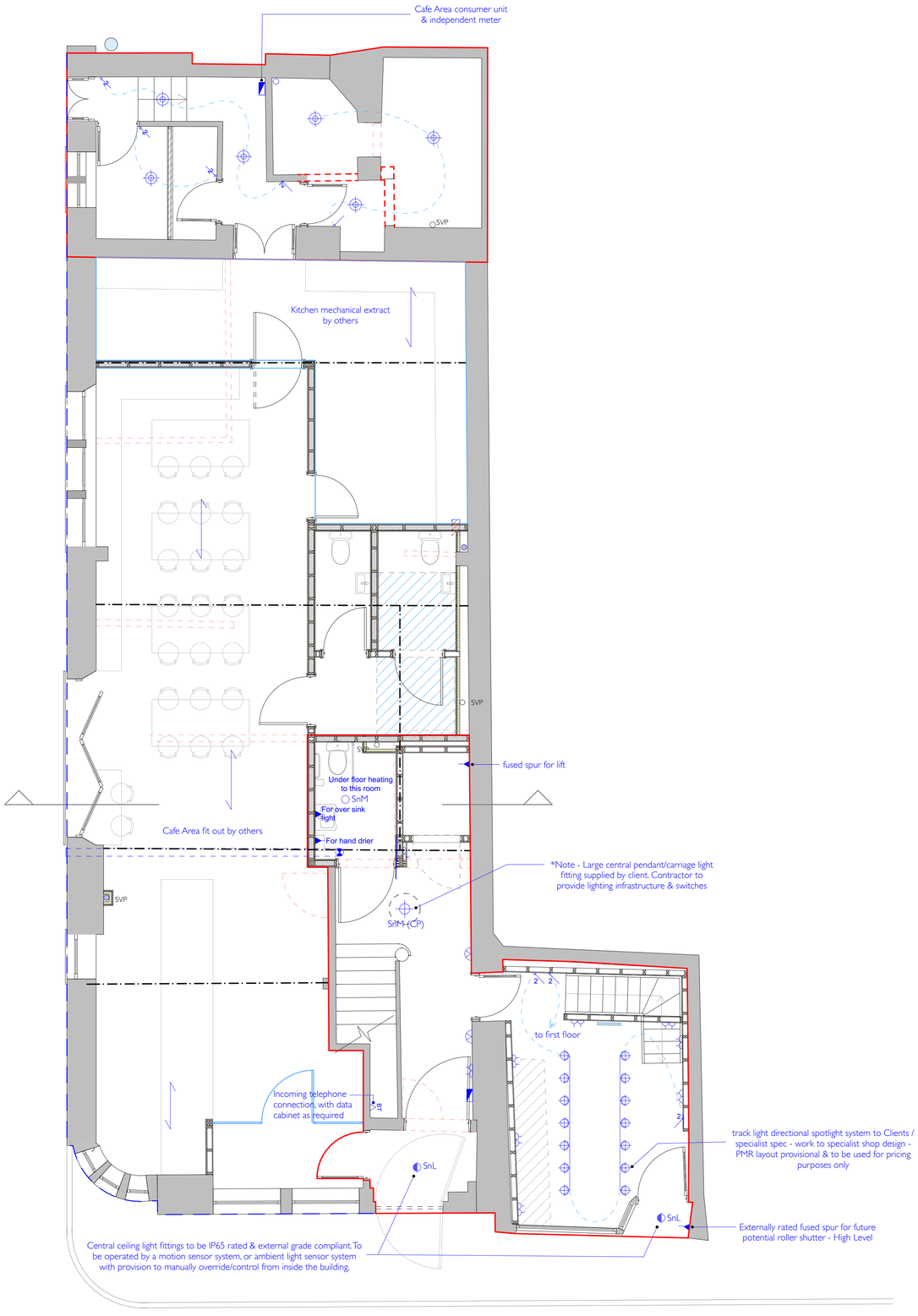

ELECTRICAL & LIGHTING SYMBOLS

- SnM — Ceiling light fitting with motion sensor
- SnL — Ceiling light fitting with ambient light sensor
- SnM — External grade Ceiling light fitting with motion sensor
- T — Directional track lighting to Clients requirements/ Specification
- S — Directional & and indvdually controlled spot lighting (or similar) to Clients requirements/ Specification
- CP — Lamp - large Feature Vintage Pendant, supplied by Client - contractor to supply ceiling rose & connection only
- P — Lamp - large Pendant
- sP — Lamp - Small Pendant
- Lamp - Wall mounted
- LED strip light
- Switch - Lightswitch 1 way
- Switch - Lightswitch 2 way
- Switch - Lightswitch 2 way - controlling 4 track lights
- Switch - Lightswitch 2 way - controlling 6 track lights
- Bell push
- Bell sounder
- Consumer unit
- Fused spur - Switched 13A
- Lamp - Dendant
- Mechanical extract fan
- Socket - Switched double 13A
- BT — Socket - Telephone
- TV — Socket - Television
- Socket - Switched double 13A
- Socket - Switched double 13A fitted above worktop level
- Floor mounted Socket - min 2 x Switched double 13A - client to specify
- Air Conditioning Unit
- Indicative cable tray positioning
- Indicative galvanised steel conduit runs at high level, above window & door heads; but below new mf ceiling. Full internal wall coverage required to future proof and give flexibility on socket positioning. Matching vertical conduit runs (each approx 3m in length - not shown on plan) will be required to wall connect to wall electrical sockets as shown
- Electrical Radiator

READ IN CONJUNCTION WITH ROOM DATA SHEETS

Rev:	Date:	Comment:

PMR ARCHITECTURE
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Highweek Street
Newton Abbot
TQ12 1TQ
01626 572250
info@pmr-architecture.co.uk
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Project
67 Morrab Road
Penzance
Cornwall

Drawing Title
Ground Floor Electrics Layout

Scale
1:50 @ A1

Date	Status
November 2024	Tender

Drawing No.	Revision
20.81 104	A

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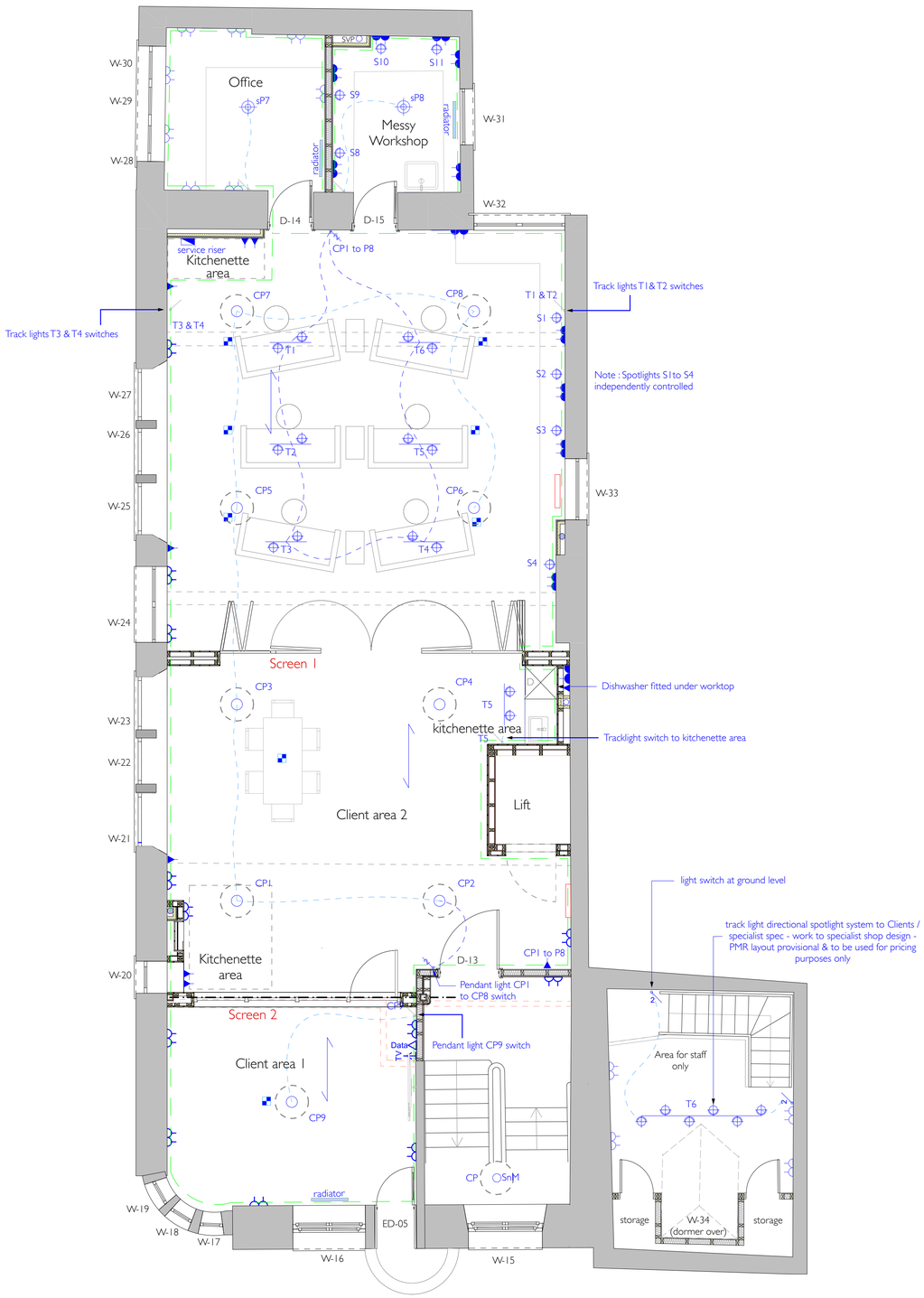

LIGHTING PRINCIPLE:

***P1 TO P9**

9 LARGE PENDANTS LIGHTS (SUPPLIED BY CLIENT) FOR AMBIENT LIGHTING - POSITIONED EVENLY WITHIN SPACES - 2 way controlled, from opposite ends of the room, so they all turn on/off together.

***T1 TO T4**

TRACK LIGHTING - T1 / T2 combined & T3 / T4 combined. Each are controlled from switches on opposite walls near their respective work areas.

***T5**

TRACK LIGHTING - 1 way controlled, for kitchenette area only

***T6**

TRACK LIGHTING - 2 way controlled, from mezzanine level and also ground floor level.

***S1 TO S7**

INDIVIDUALLY CONTROLLED LIGHTING FOR WORK BENCHES - Lighting type to be specified by client

***SnM**

Ceiling light on motion censors on the stairs landing

WORK BENCHES

We have allowed 1 floor electrical double socket, or 1 double wall mounted electrical double socket per workstation.

AIR CONDITIONING & CONSUMER UNITS

We have shown two A/C Units at opposite ends of the room

ELECTRICAL & LIGHTING SYMBOLS

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- SnL — Ceiling light fitting with ambient light sensor
- SnM — External grade Ceiling light fitting with sensor
- T — Directional track lighting to Clients requirements/ Specification
- S — Directional & and indivdually controlled spot lighting (or similar) to Clients requirements/ Specification
- CP — Lamp - large Feature Vintage Pendant, supplied by Client - contractor to supply ceiling rose & connection only
- P — Lamp - large Pendant
- sP — Lamp - Small Pendant
- Lamp - Wall mounted
- LED strip light
- Switch - Lightswitch 1 way
- Switch - Lightswitch 2 way
- Switch - Lightswitch 2 way - controlling 4 track lights
- Switch - Lightswitch 2 way - controlling 6 track lights
- Bell push
- Bell sounder
- Consumer unit
- Fused spur - Switched 13A
- Lamp - Dendant
- Mechanical extract fan
- Socket - Switched double 13A
- Socket - Telephone
- Socket - Television
- Socket - Switched double 13A
- Socket - Switched double 13A fitted above worktop level
- Floor mounted Socket - min 2 x Switched double 13A - client to specify
- D — Dishwasher
- Air Conditioning Unit
- Indicative galvanised steel conduit runs at high level, above window & door heads. Full internal wall coverage required (as shown) to future proof and give flexibility on socket positioning. Matching vertical conduit runs (each approx approx 3m in length - Note : not shown on plan) & will be required to wall connect with wall sockets as shown
- Electrical Radiator - Traditional 'cast iron' design - size and spec to be advised by specialist

READ IN CONJUNCTION WITH ROOM DATA SHEETS

Rev:	Date:	Comment:

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Project
67 Morrab Road
Penzance
Cornwall

Drawing Title
First Floor Electrical Layout

Scale
1:50 @ A1

Date	Status
November 2024	Tender
Drawing No.	Revision
20.81 105	A

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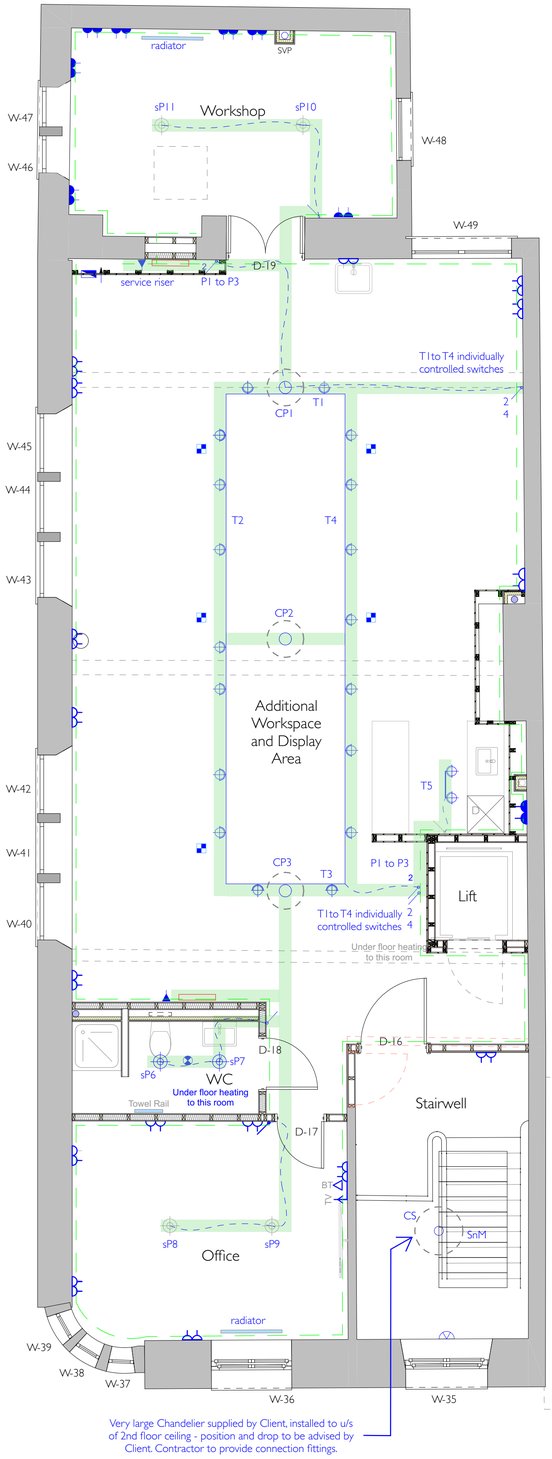

PRINCIPLE:

***P1 TO P3**

3 LARGE PENDANTS LIGHTS (SUPPLIED BY CLIENT) FOR AMBIENT LIGHTING - POSITIONED CENTRALLY WITHIN SPACE - 2 way controlled, from opposite ends of room, they all turn on/off together.

***T1 TO T4**

TRACK LIGHTING - 2 way controlled, from opposite ends of room, they can turn on/off as individual units from the main wall light switches.

***T5**

TRACK LIGHTING - 1 way controlled, for kitchenette area only

***SnM**

Ceiling lights on motion censors in front of the lift & on the stairs landing

AIR CONDITIONING & CONSUMER UNITS

We have shown two A/C Units at opposite ends of the room

FLOOR MOUNTED ELECTRICAL SOCKETS

Provision for floor mounted electrical sockets for potential display area requirement - indicative layout shown and subject to change dependent on client requirement.
Refer to drawing 20.81 118

ELECTRICAL & LIGHTING SYMBOLS

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- SnL — Ceiling light fitting with ambient light sensor
- SnM — External grade Ceiling light fitting with sensor
- T — Directional track lighting to Clients requirements/ Specification
- S — Directional & and indivdually controlled spot lighting (or similar) to Clients requirements/ Specification
- CP — Lamp - large Feature Vintage Pendant, supplied by Client - contractor to supply ceiling rose & connection only
- CS — Chandelier - Very large Feature Vintage Chandelier, supplied by Client - contractor to supply ceiling rose & connection only
- P — Lamp - large Pendant
- sP — Lamp - Small Pendant
- Lamp - Wall mounted
- LED strip light
- Switch - Lightswitch 1 way
- Switch - Lightswitch 2 way
- Switch - Lightswitch 2 way - controlling 4 track lights
- Switch - Lightswitch 2 way - controlling 6 track lights
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TQ12 1TQ
01626 572250
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www.pmr-architecture.co.uk

Project
67 Morrab Road
Penzance
Cornwall

Drawing Title
Second Floor Electrical Layout

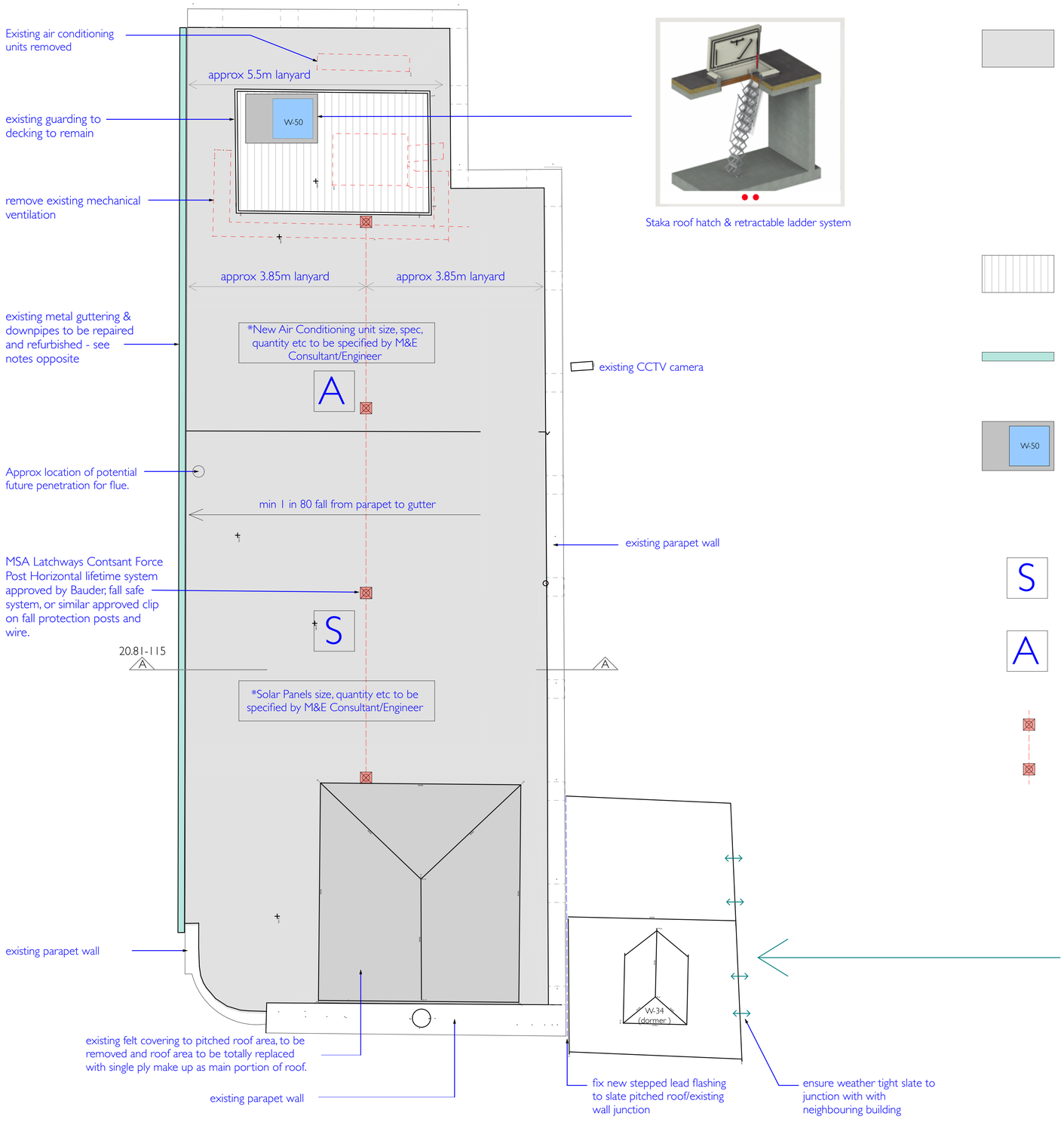
Scale
1:50 @ A1

Date
November 2024

Status
Tender

Drawing No.
20.81 106

Revision
A



Staka roof hatch & retractable ladder system

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FINISHES - Zone 14 :

Roof to main building:

Refurbishments :

1.Existing flat roof area
Existing flat roof covering to be removed. From photographic evidence, we can assume the existing felt roof make up is old and more than likely doesn't contain an insulation zone. Contractor to investigate to see if there is an existing substructure ply deck (or similar) and to remove and replace where necessary, if the existing deck has deteriorated. If the deck is deemed in very poor condition, completely remove. Fit new compliant Air & vapour barrier layer over ply deck to manufactures recommendations (or directly over existing metal deck if there is no ply deck, or if deteriorated ply decking is removed) and dress up inside of parapet wall min150mm above finished roof level. Install compliant foil backed rigid insulation over to the required thickness to meet the U value requirement for the building. (min130mm thick to achieve the required min 0.18 U value - Energy consultant to advise requirement) Existing roof area would appear to comply with minimal fall of 1 in 80; so new rigid insulation should not be required to be cut to falls* (*Contractor to check on site.) Rigid insulation to be returned up inside face of existing parapet wall to manufactures requirements. Final1.5mm thick Rubber membrane fitted over insulation - dependant on system used, this could be mechanically fixed or adhered to insulation.The final roofing system should be fit for purpose (I.e. comply with calculated wind loadings, be suitable for foot traffic for maintenance etc). Membrane colour to be RAL 7001 or similar (grey)

3. Existing decked area
Existing decked area to be removed. Substructure & weatherproof roof covering under to be inspected and replaced / made good / replaced depending on condition.
New composite decking / supporting structure to be installed in compliance with manufactures instructions/recommendations/requirements.
All fixing elements to be fully marine grade compliant.

2. Existing guttering
Existing original metal guttering (& downpipes) to be fully restored & made good where required. All guttering and downpipes to be fully treated for rust/corrosion and protected for the future with specialist paint.

3. New skylight & retractable ladder
Existing skylight to be removed.
New openable Powder coated Stainless steel AISI 1.4301 (304) or equivalent, sprung skylight with integral retractable drop down ladder to be installed.
Approx Skylight size :1550mm x 1050mm.
Glazed section to be at least the same size as exiting skylight.
Timber upstand to be constructed to accommodate roof light - Approx height 330mm.
Upstand construction details/information as skylight manufactures recommendations.
Details & Specification of skylight roof hatch to be Staka type, or similar approved products.

4. Solar panels
New Solar Panel units to be installed and fitted in compliance with Specialist M&E Engineer design & specification.
PMR layout is purely indicative & is in no way representational.
See separate information from Specialist M&E consultant for exact requirements.

5. Air conditioning
New Air conditioning units installed and fitted in compliance with Specialist M&E Engineer design & specification.
PMR layout is purely indicative & is in no way representational.
See separate information from Specialist M&E consultant for exact requirements.

6. Clip on fall arrest type system for protection from falling
Clip on type fall arrest system to be used in conjunction with new Bauder (or similar approved) replacement Flat roof.
Anchor points & setting out are indicatively shown on this plan for tender / pricing purposes only.
Refer to specialist & Structural Engineer details for any technical requirements, specifications, loadings, setting out etc

FINISHES - Zone 15 :

Shop roof replacement: (now required as warm roof area as new mezzanine below)

Fully remove existing slate to roof and damaged dormer - Dispose of all.
Rebuild timber structure as required with C24 treated timbers suitable for purpose.
Strip any existing roof felt on roof & dormer & remove existing tile battens.
Install new rigid insulation to fully fit in space between existing roof rafters. Install 2nd layer of rigid insulation under rafters to prevent cold bridging and also achieve required U rating requirement. As existing rafter size is not currently established (& therefore thickness of insulation in-between rafters cannot be specified) thickness/spec of insulation under rafters to be advised/specified by energy consultant to comply with SAP requirements. Install vapour control barrier to inside face of insulation to manufactures instructions. Batten over with 25mm x 25mm sw timber battens. Install plasterboard line over & tape and skim.
On outside face of rafter fit new roof felt & batten over to leave a clear & unobstructed 25mm air gap.
Counter batten & refit new SSQ Riverstone slates, nailed.
Fit new stepped lead flashing detail to roof / wall junction with main building. Ensure existing weatherproof slate to slate junction with neighbouring building is maintained.
Fit new fascias - Note : allow for under eaves ventilation.
Fix & make good existing rainwater goods; or replace dependant on condition.
Note : Contractor to fix and make good existing Shop fronts - Contractor to remove and replace any damaged render, damaged timber etc

Rev:	Date:	Comment:

PMR ARCHITECTURE
Minerva House
Highweek Street
Newton Abbot
TQ12 1TQ
01626 572250
info@pmr-architecture.co.uk
www.pmr-architecture.co.uk

Project
67 Morrab Road
Penzance
Cornwall

Drawing Title
Roof & Roof Electrical Plan

Scale
1:50 @ A1

Date
November 2024

Status
Tender

Drawing No.
20.81 107

Revision

APPENDIX B

SAXTY VENTILATION INFORMATION

EMILY NIXON JEWELLERY
Whites Warehouse
25 Foundry Square
Hayle
Cornwall
TR27 4HH

Saxty Engineering Ltd
New Road
Perranporth
Cornwall TR6 0DL

T: 01872 573230
F: 01872 572044

www.saxty.co.uk
info@saxty.co.uk

29th January 2024

Ref: 67 Morab Road, Penzance - revised

Dear Barney,

Further to your recent email and our previous on-site discussions, we have pleasure in submitting our revised quotation, as follows.
As previously discussed, the existing flue would not be suitable to use for ventilation.

Quotation 1: Decommissioning

To safely recover all refrigerant gasses from the 2no. air conditioning systems and return to the manufacturers for reprocessing.
To decommission and remove from site for responsible disposal off site, the following;

- 2no. Daikin air conditioning systems.
- 1no. Air handling unit.
- All associated interconnecting pipework and control cables.
- All associated ductwork on the roof.

Price: £ 1,485.00 + Vat.

Quotation 2: Ventilation to Shop

To supply and install heat recovery ventilation to the Shop area, complete with the following;

- 1no. Heat recovery ventilation unit.
- Internal grilles.
- External louvres.

Price: £1,980.00 + Vat.

Saxty Engineering is also a member of **ADCAS** – Association of Ductwork Contractors and Allied Services as well as **FETA** – the Federation of Environmental Trade Associations

Quotation 3: Air Conditioning – First Floor

To supply and install air conditioning, comprising the following;

- 2no. Fujitsu ceiling mounted Cassette type, Air Conditioning units (2 x 7kW).
- 2no. Remote controllers.
- 2no. Fujitsu external condenser units.
- Approx. 40mts of copper pipework, Armaflex pipe insulation and control cable.
- Condensate drain/pumps.

Price: £ 6,220.00 + Vat.

Quotation 4: Air Conditioning – Second Floor

To supply and install air conditioning, comprising the following;

- 2no. Fujitsu ceiling mounted Cassette type, Air Conditioning units (2 x 5kW).
- 2no. Remote controllers.
- 2no. Fujitsu external condenser units.
- Approx. 30mts of copper pipework, Armaflex pipe insulation and control cable.
- Condensate drain/pumps.

Price: £ 5,740.00 + Vat.

Quotation 5: Kitchen and Bathroom Extraction:

To supply and install extraction systems, complete with the following;

1st Floor

- 1no. Bathroom extract fan.
- 1no. Kitchen extract fan.
- 2no. External louvres.
- All necessary brackets and fixings.

2nd Floor

- 2no. Bathroom extract fans.
- 1no. Kitchen extract fan.
- 3no. External louvres.
- All necessary brackets and fixings.

Price: £1,980.00 + Vat.

Budget Quotation 6: Cranage:

To employ the services of a professional lifting company to carry out the following;

- Remove from roof – 2no. air conditioning units and 1no. air handling unit.
- Lift onto roof - 2no. air conditioning units and 1no. LEV fan unit.

Budget Price: £3,580.00 + Vat.

Quotation 6: LEV:

To manufacture, supply and install a LEV system, comprising the following;

- 1no. Three phase high pressure fan.
- 1no. Fan control.
- 1no. Galvanised filter enclosure with removeable panel filter.
- Approximately 20mts of galvanised spiral duct.
- Galvanised duct fittings as required.
- 5no. Branches.
- 5no. Blast gate dampers.
- 5no. Flexible lobster back arms.
- 5no. Hoods.
- 2no. Duct attenuators.
- 1no. Vertical discharge cowl.
- Brackets and fixings as required.

Price: £7,895.00 + Vat.

Local Exhaust Ventilation

What Is Local Exhaust Ventilation

LEV is an engineering control system to reduce exposures to airborne contaminants such as dust, mist, fume, vapour or gas in the workplace.

Legal Requirements

Health and safety law, is primarily aimed at employers, whose work activities with hazardous substances poses a risk to employees and others.
Under the Health and Safety at Work etc. Act 1974, every employer has health and safety duties to themselves, their employees and other people who may be affected by the way they carry out their work.

Legal Responsibilities

The employer of the people being protected by the LEV has legal responsibilities under;
The Health and Safety at Work Act 1974.
The Control of Substances Hazardous to Health Regulations 2002 (COSHH).
The Management of Health and Safety at Work Regulations 1999.
There are also special provisions for employers in safety data sheets under REACH.

Our LEV Services:

We can provide;

- Initial appraisal.
- Routine maintenance.
- Annual thorough examination and test.
- Breakdown and call-out service.
- Design and installation.

We are BOHS qualified and P600, P601, P602, P603 & P604 accredited to carry out LEV testing, design and installation works.

Budget Quotation 7: Smoke Vent:

To supply and fit a 1mtr automatic smoke vent with a clear opening of 0.8m². Complete with opaque PVC panel and fixing kit.

Budget Price: £3,610.00 + Vat.
Note: this price does not include for controls, sensors or fire panel.

Budget Quotation 8: Wall / Roof Openings:

To engage the services of a sub contract drilling and cutting company to carry out the following;

- 3no. Wall openings 110Ø.
- 1no. Roof opening 220Ø.
- 2no. Roof openings 110Ø.
- Remove debris from site.

Budget Price: £2,845.00 + Vat.

Asbestos:

The customer must make Saxty aware (in writing/email) of the presence of asbestos in the areas of works. An asbestos register must also be made available where applicable.
Should our engineers suspect ACM's to be present, work will stop immediately until the site is deemed clear and safe to continue. Any costs in delays including consequential costs will be borne by the customer.

General:

The air conditioning cassette units would each have a galvanised steel casing with a plastic fascia grille. The external units would be mounted on the roof, as the current units are installed.

We have included for wall type extraction fans in serving the bathrooms and kitchens on the first floor venting straight through the wall to outside. With the second floor we have included to vent straight through the roof. Note, a roofer would be required to seal and make good the roof. Should a more industrial look be required with surface mounted spiral ductwork the we could requote for this.

The ventilation system for the shop would comprise a small fresh air heat recovery unit.

The LEV ductwork would run from the work stations and up through the second floor onto the roof, where the fan would be located. We have allowed for 70% of the LEV extraction points to be used at any one time, please advise if this does not meet your requirements.

The budget price for the crane is for a single visit, thus, remove old plant and lift new plant on the same day.

Terms and Conditions:

- All work carried out during normal weekday working hours.
- Payment – a 60% deposit would be required with the balance on completion.
- Clear site with free access to areas of work.
- This quotation remains open for 60 days after which revisions may be required.
- Quotations are based on all or most of the work going ahead as one continuous, uninterrupted job.
- Use of site welfare facilities.
- On-site parking for at least one vehicle.
- RAMS available on request.
- Insurance details available on request.

Exclusions:

- Vat, which will be charged at governing rate at time of invoice.
- Builder's work / / Roofing work other than quoted.
- Structural survey.
- Asbestos survey.
- Cutting holes in fabric of building or sealing afterwards other than quoted.
- Electrical works for fans, air conditioning etc. including tails and final connections.
- Duct insulation.
- Plumbing or gas works.
- Removal of ductwork and flue from ground floor, however we could quote for this work if required.
- New ductwork or duct modifications to ground floor, however we could quote for this work if required.
- Retentions.
- Fire dampers, fire/smoke dampers, fire panel, fire rated ductwork, fire stopping.
- MCD.
- Drawings.
- Access equipment other than steps.
- External scaffolding.
- Road closures for crane, if required.
- Any planning permission or local authority / landlord's approval including any noise or smell requirement, should you have any doubt please contact your local authority.

We hope this revised quotation meets with your approval but should you need any further clarification or assistance please do not hesitate to contact us.

Yours sincerely,

D Anderson

David Anderson

APPENDIX C

ECO NRG PV INSTALLATION

Emily Nixon

Project Name: 009168 - 24 Eurener 430W + Solis 10kW inverter

Phone: 07595220583

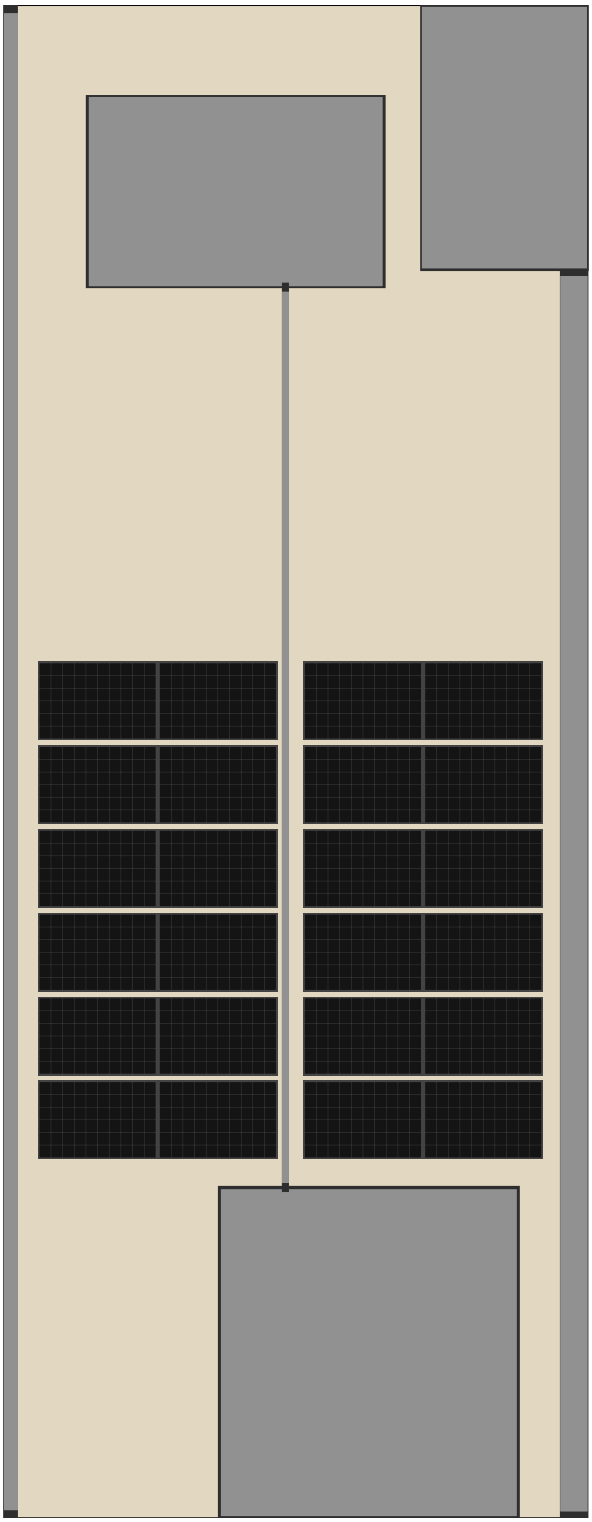
Address: 67 Morrab Road, Penzance, TR18 2QJ

Date Created: 12th July 2024

Designer: Mat Green

Roof Layout

Roof 1



Component list

Item	Quantity
 Eurener Nexa 430W Mono Black solar panel	24
 Solis 10kW S5 3 Phase Dual MPPT - DC inverter	1
 Emlite EMP1 3ph Meter	1
 Label sheet	1
HIES 5 year Warranty	1
MCS & Electrical Certification	1
 AC isolator - IMO - 20A 4-pole	2
 MC4 4mm Connector Pair	4
50m reel of 4mm2 solar cable	1
 Renusol console	24
 Console mounting bar	48
 Console mounting clips - pack of 4	24
 Console elongation bar - set of 2	48

Inverter checks

Solis 10kW S5 3 Phase Dual MPPT - DC

Panels			
PV power	**10320**	Rated AC output	**10000**

Input 1: 12 Eurener Nexa 430W Mono Black solar panels in 1 strings

Panels		Inverter	
PV power	**5160 W**		
Open circuit voltage at -10° C	**508 V**	Max DC voltage	**600 V**
V_{mpp} at 40° C	**366 V**	V_{mpp} lower limit	**160 V**
V_{mpp} at -10° C	**421 V**	V_{mpp} upper limit	**1000 V**
I_{mpp} at 40° C	**14 A**	Max DC input current	**20 A**

Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.

✓

Max power point range

The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.

✓

Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.

Input 2: 12 Eurener Nexa 430W Mono Black solar panels in 1 strings

Panels		**Inverter**	
PV power	**5160 W**		
Open circuit voltage at -10° C	**508 V**	Max DC voltage	**600 V**
V_{mpp} at 40° C	**366 V**	V_{mpp} lower limit	**160 V**
V_{mpp} at -10° C	**421 V**	V_{mpp} upper limit	**1000 V**
I_{mpp} at 40° C	**14 A**	Max DC input current	**20 A**

Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.

Max power point range

The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.

Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.

Electrical

Solis 10kW S5 3 Phase Dual MPPT - DC

AC Isolator

A AC isolator - IMO - 20A 4-pole has been specified for this input

Current

The rated isolator current (20A) is greater than the rated inverter current (15.9A)

Phases

The isolator is suitable for use on a three phase inverter.

Input 01

DC Isolator

Integrated isolator

This inverter contains an integrated DC Isolator.

Cable

10m of 4mm2 solar cable has been specified

Voltage drop

Voltage drop at maximum power point at 40°C will be around **1.19 V (0.33 percent)**

Input 11

DC Isolator

Integrated isolator

This inverter contains an integrated DC Isolator.

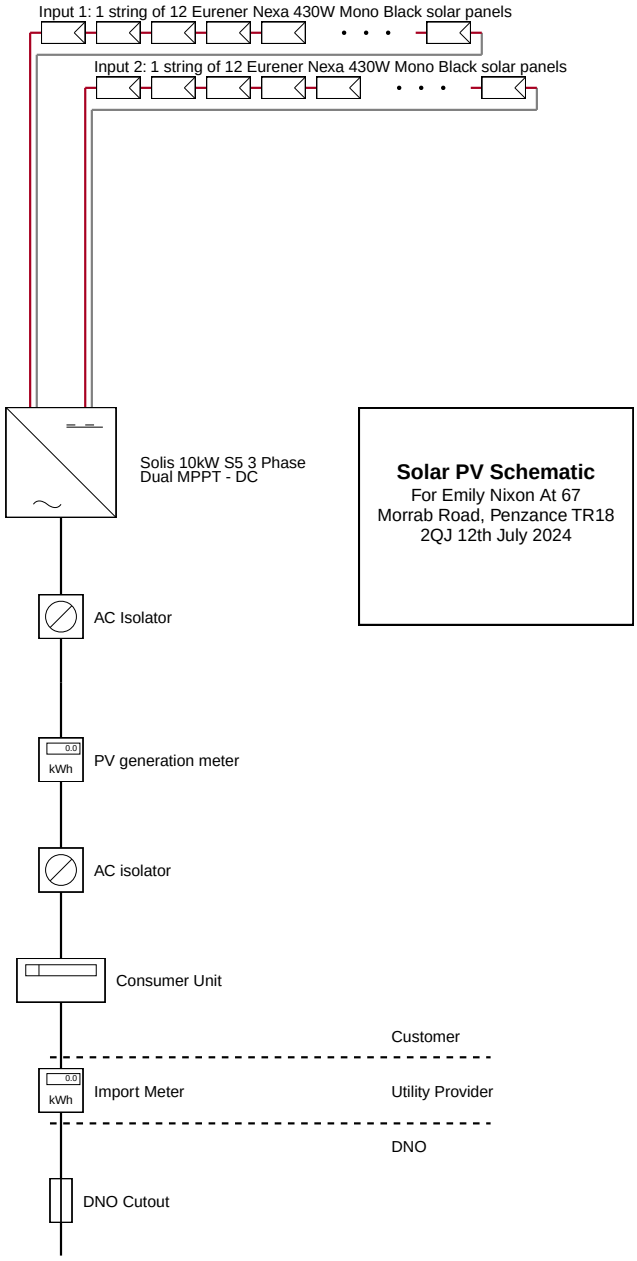
Cable

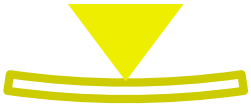
10m of 4mm2 solar cable has been specified

Voltage drop

Voltage drop at maximum power point at 40°C will be around **1.19 V (0.33 percent)**

Schematic diagram





Structural calculations

Weight loading calculations

For a traditional cut roof with rafters and purlins we recommend also using our rafter calculator to check the load-bearing capacity of the rafters. Even if the increase in loading is more than 15% the rafters may well be able to take the additional weight.

Please note that this method does not calculate the strength of the roof, and if a roof was badly constructed, does not meet existing building regulations, or is in poor condition then it may still not be appropriate to install an array.

Roof 1

Dead load from roof covering	0 kN/m^2
Imposed load	0.75 kN/m^2
Total loading without solar array	**0.75 kN/m^2**

Weight of solar panels and mounting	878.7 kg
Area covered by solar array	80.2 m^2
Loading imposed by solar array	0.11 kN/m^2
Total loading with solar array	**0.9 kN/m^2**

Increase in loading due to solar array: 14.7%

An increase of less than 15% in the load imposed on a roof is not considered to be a significant change (The Building Regulations 2010, Approved Document A).

Performance Estimate

Site details

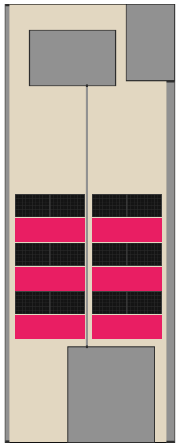
Client	Emily Nixon
Address	67 Morrab Road, Penzance

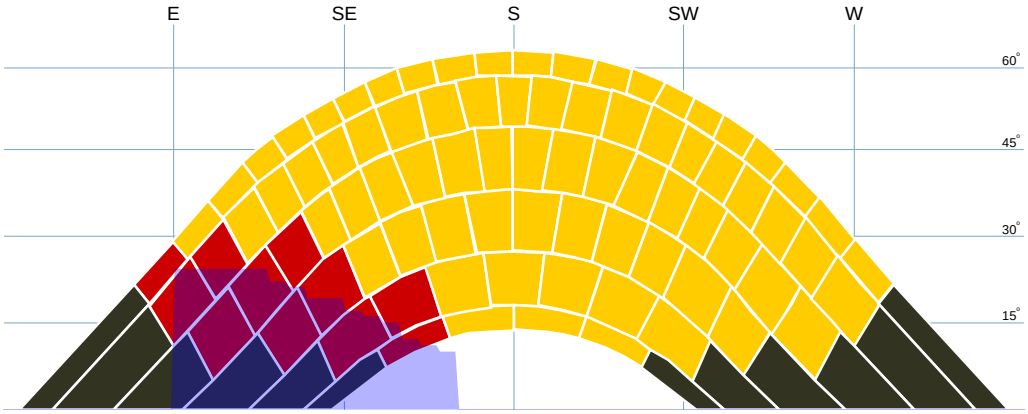
The sunpath diagram shows the arcs of the sky that the sun passes through at different times of the day and year as yellow blocks. The shaded area indicates the horizon as seen from the location of the solar array. Where objects on the horizon are within 10m of the array, an added semi-circle is drawn to represent the increased shading. Blocks of the sky that are shaded by objects on the horizon are coloured red, and a shading factor is calculated from the number of red blocks. The performance of the solar array is calculated by multiplying the size of the array (kWp) by the shading factor (sf) and a site correction factor (kk), taken from tables which take account of the geographical location, orientation and inclination of the array.

Inverter 1

Solis 10kW S5 3 Phase Dual MPPT - DC

Input 1

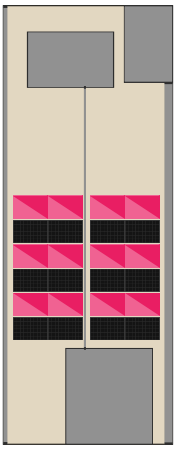


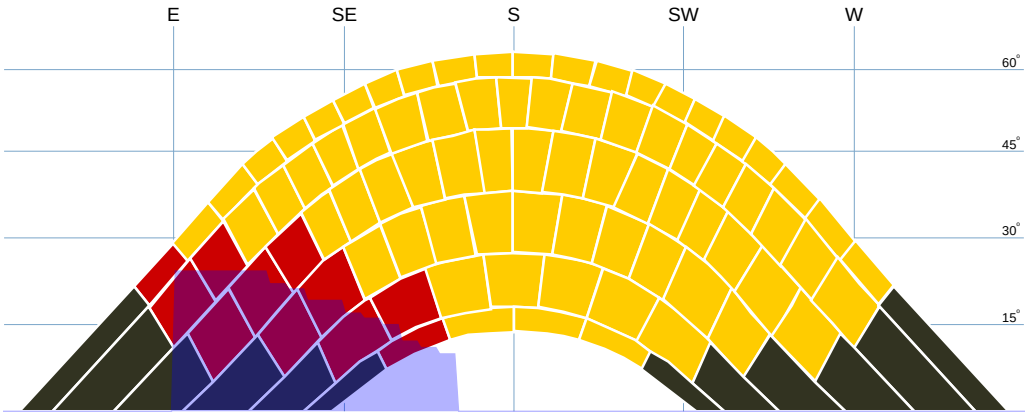


A. Installation data		
Installed capacity of PV system – kWp (stc)	**5.160**	kWp
Orientation of the PV system – degrees from South	**-98**	°
Inclination of system – degrees from horizontal	**0**	°
Postcode region	**4**	

B. Performance calculations		
kWh/kWp (Kk)	**907**	kWh/kWp
Shade factor (SF)	**0.89**	
Estimated output (kWp x Kk x SF)	**4165**	kWh

Input 2





A. Installation data		
Installed capacity of PV system – kWp (stc)	**5.160**	kWp
Orientation of the PV system – degrees from South	**-98**	°
Inclination of system – degrees from horizontal	**0**	°
Postcode region	**4**	

B. Performance calculations		
kWh/kWp (Kk)	**907**	kWh/kWp
Shade factor (SF)	**0.89**	
Estimated output (kWp x Kk x SF)	**4165**	kWh

Performance Summary

A. Installation data		
Installed capacity of PV system – kWp (stc)	**10.32**	kWp
Orientation of the PV system – degrees from South	**See individual inputs**	
Inclination of system – degrees from horizontal	**See individual inputs**	
Postcode region	**4**	
B. Performance calculations		
kWh/kWp (Kk)	**See individual inputs**	
Shade factor (SF)	**See individual inputs**	
Estimated output (kWp x Kk x SF)	**8330**	kWh

Important Note: The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is based upon the standard MCS procedure is given as guidence only for the first year of generation. It should not be considered as a guarantee of performance.

Shading will be present on your system that will reduce its output to the factor stated. This factor was calculated using the MCS shading methodology and we believe that this will yield results within 10% of the actual energy estimate stated for most systems.

This system performance calculation has been undertaken using estimated values for array orientation, inclination or shading. Actual performance may be significantly lower or higher if the characteristics of the installed system vary from the estimated values.

Equipment and Services

Equipment Costs

24x Eurener Nexa 430W Mono Black solar panel		£3,857.28
Solis 10kW S5 3 Phase Dual MPPT - DC inverter		£968.97
Emlite EMP1 3ph Meter		£106.38
Label sheet		£2.20
MCS & Electrical Certification		£45.50
2x AC isolator - IMO - 20A 4-pole		£28.55
4x MC4 4mm Connector Pair		£10.66
4 x 50m reel of 4mm2 solar cable		£140.40
24x Van Der Valk East West Mounting System		£2,808.00
scaffold access		£3,900.00
HIES 5 year Warranty		£120.25
	Total equipment cost	**£11,988.19**

Services Costs

Installation labour - Roofing		£2,160.00
Installation labour - Electrical		£740.00
	Total services cost	**£2,900.00**

Grants

Totals

	Total before tax	**£14,888.19**

VAT at 20%	**£2,977.64**
Total including tax	**£17,865.83**

Financial

Generation

The system is expected to generate 8330 kWh per year initially, decreasing gradually as the solar cells degrade. Over the 25 year term of this financial projection the total generation is expected to be 200621 kwh, of which 196609 kWh will be consumed on site and 4012 kWh exported.

201 MWh

Payback

After adjusting projected costs and benefits for inflation, and applying a discount rate of 4%, the initial system cost of £17,865.83 is expected to be recouped after 5 years.

5 years

Net Present Value

The total present value of future benefits and costs, using a discount rate of 4% per year, is £77,730.72. The cost of the PV system is £17,865.83. The net present value of the project is therefore £62,842.53. A positive net present value is a good indication that the project is financially worthwhile.

£62842.53

IRR

The Internal Rate of Return is a useful measure for comparing the relative profitability of investments.

22.7 %

Disclaimer

Our financial model calculates the benefits of a solar PV installation (such as savings in electricity, or payments for exported electricity) and costs (the initial purchase cost, and any future maintenance costs if entered), over the projected lifespan of the system. Values are corrected for inflation, system degradation, and discount rate - a measure that accounts for the fact that a promise of a monetary sum in the distant future is usually considered less valuable than the promise of the same sum in the near future.

A model is only as accurate as the assumptions it makes. You should consider whether the values chosen are appropriate for your situation. There are many variables that dictate the financial return of a solar installation and we cannot forecast how they may change in the future. This financial projection shows a likely scenario for future financial returns. Actual returns may vary significantly from this forecast.

Assumptions

Inflation rate	**4%**
Cost of electricity	**£0.4 /kWh** increases with inflation
System size	**10.32 kWp** degrades at 0.3% per year
Discount rate	**4%**
Projection length	**25 years**

Income and savings

The projected income from the system over the project lifetime in payments for generated and exported electricity, along with electricity savings, are shown in the table and graph below.

These figures assume an inflation rate of 4 percent.

	Export payments	Electricity savings	**Total**
Year 1	25	3326	**3351**
Year 2	26	3448	**3475**
Year 3	27	3575	**3603**
Year 4	28	3707	**3736**
Year 5	29	3844	**3874**
Year 6	31	3986	**4016**
Year 7	32	4133	**4164**
Year 8	33	4285	**4318**
Year 9	34	4443	**4477**
Year 10	35	4607	**4642**
Year 11	37	4777	**4814**
Year 12	38	4953	**4991**
Year 13	39	5136	**5175**
Year 14	41	5325	**5366**
Year 15	42	5522	**5564**
Year 16	44	5725	**5769**
Year 17	45	5937	**5982**
Year 18	47	6156	**6203**
Year 19	49	6383	**6431**
Year 20	51	6618	**6669**
Year 21	53	6862	**6914**
Year 22	54	7115	**7169**
Year 23	56	7377	**7434**
Year 24	59	7650	**7708**
Year 25	61	7932	**7992**

£1016

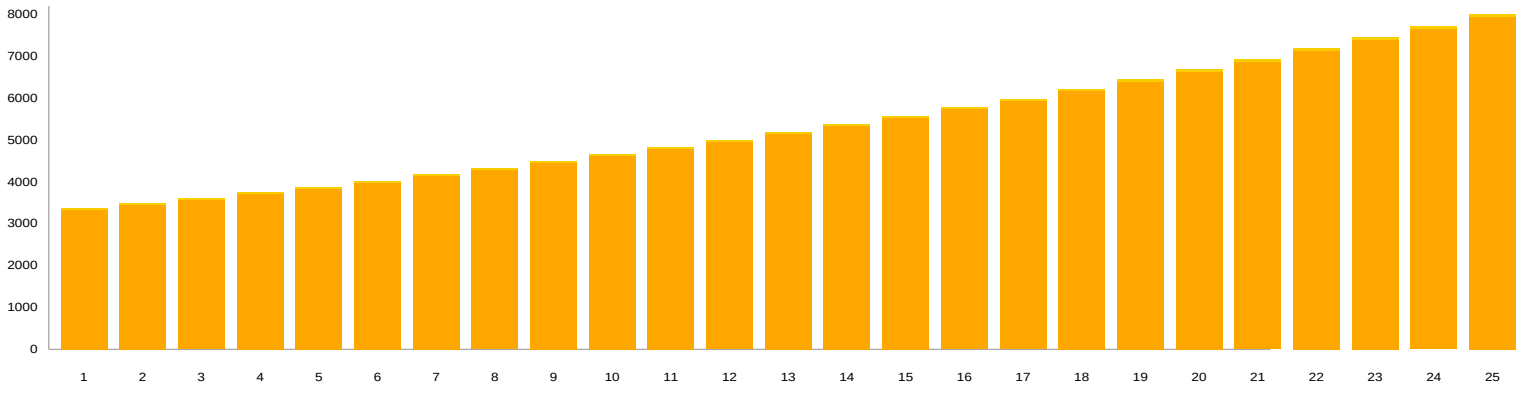
Total Export Payments

over 25 years

£132822

Electricity savings

over 25 years

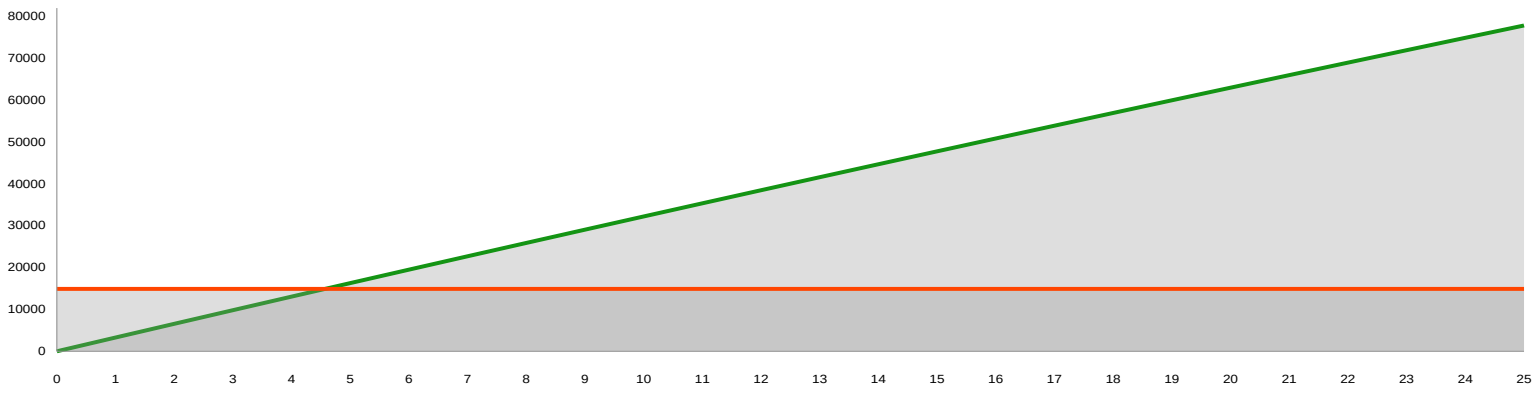


The bottom line

The table and graph below show the discounted costs for the project (including the initial capital required for the installation), against the total discounted benefits from income and savings on electricity bills.

The system pays for itself in 5 years.

	Discounted benefits	Cumulative benefits	Discounted costs	Cumulative costs	**Cashflow**
Year 1	3284	3284	0	14888	**-11604**
Year 2	3269	6553	0	14888	**-8335**
Year 3	3254	9807	0	14888	**-5081**
Year 4	3239	13046	0	14888	**-1842**
Year 5	3224	16270	0	14888	**1382**
Year 6	3209	19480	0	14888	**4591**
Year 7	3195	22674	0	14888	**7786**
Year 8	3180	25854	0	14888	**10966**
Year 9	3165	29019	0	14888	**14131**
Year 10	3151	32170	0	14888	**17282**
Year 11	3136	35306	0	14888	**20418**
Year 12	3122	38428	0	14888	**23540**
Year 13	3108	41536	0	14888	**26648**
Year 14	3093	44629	0	14888	**29741**
Year 15	3079	47708	0	14888	**32820**
Year 16	3065	50773	0	14888	**35885**
Year 17	3051	53824	0	14888	**38936**
Year 18	3037	56860	0	14888	**41972**
Year 19	3023	59883	0	14888	**44995**
Year 20	3009	62892	0	14888	**48004**
Year 21	2995	65887	0	14888	**50999**
Year 22	2981	68869	0	14888	**53980**
Year 23	2968	71836	0	14888	**56948**
Year 24	2954	74790	0	14888	**59902**
Year 25	2940	77731	0	14888	**62843**



hies

Home Insulation & Energy Systems
Quality Assured Contractors Scheme

tsi

APPROVED CODE™
TRADINGSTANDARDS.UK

Abbreviated:

Code of Practice

For Consumers

For a free copy of the full Code of Practice, contact:

Tel: 0344 324 5242
www.hiesscheme.org.uk

V8 - 31.10.2017

Table of Contents

INTRODUCTION TO THE HIES CODE OF PRACTICE

This is a summary of the Code of Practice for the Home Insulation & Energy Systems Quality Assured Contractors Scheme (HIES). The full version is available from www.hiesscheme.org.uk.

Upon joining a scheme, every member agrees to be bound by the terms of this code of practice, by signing their Membership Agreement.

The Code of Practice shall have effect throughout the member's period of membership.

The Code of Practice sets out the required standards of conduct by members. It focusses on the relationship between members and consumers (although it also applies to micro-businesses). The Membership Agreement (a separate contractual document) sets out the consequences of failure to comply with the Code of Practice, including disciplinary action, compliance default action and how compliance is monitored and audited.

Why I Strongly recommend using a HIES Member....

"With HIES you get accredited installers, independently backed guarantees (even if the firm refuses to help you or goes out of business), free access to industry inspectors at HIES discretion, professional mediators and – if you're unsatisfied – a highly regarded Ombudsman who can settle your dispute with the power of the law behind them. There are lots of confusing trade associations in the building and home improvement sectors, but few offer complete consumer protection. HIES is the real deal. And you don't pay extra for the safeguards."

Nick Ross

(HIES ambassador & former BBC Watchdog presenter).

PAGE

What is HIES?

HIES is a consumer protection organisation regulating members operating in the eco, renewable and home insulation sectors. HIES is dedicated to ensuring consumers are protected, have peace of mind and ensures comprehensive consumer protection comes as standard. HIES services are completely free of charge to consumers.

All HIES Accredited Installers are continually vetted (see page 5) in many areas in order to help ensure consumers are satisfied. All consumers receive comprehensive protection throughout the buying, installation and after sales experience. Consumers can check to establish if their installer is on the HIES national Network of Accredited Installers before placing their order.

HIES provides a **FREE service to investigate any complaints** made against members. This includes: FREE mediation, FREE independent inspections (at HIES discretion) and FREE access to an independent Ombudsman.

The scheme's ambassador is **Nick Ross** (former BBC Watchdog and Crimewatch presenter).

What Products Do HIES Cover?

SOLAR RELATED PRODUCTS:

- Solar PV Inverter
- Solar PV System
- Battery Storage System
- Solar PV & Battery Storage System
- Solar Roof
- Solar Thermal System
- Thermodynamics

HEAT PUMPS:

- Air Source Heat Pump
- Ground Source Heat Pump
- Water Source Heat Pump
- Solar Assisted Heat Pump

HEATERS:

- Fan-Assisted Storage Heater
- Infrared Heating System
- Under-Floor Heating System

ROOF RELATED PRODUCTS:

- Roof/Loft Insulation
- Roofing

BOILERS:

- Gas Fired Boiler
- Oil Fired Boiler
- Biomass Boiler
- Hybrid Boiler
- Micro Combined Heat and Power System

WINDOWS AND DOORS:

- Energy Efficient Windows
- Energy Efficient Door
- Solar Glazing

MISCELLANEOUS:

- Heating Controls
- LED Lighting
- Micro Wind Generation System
- Ancillary Products

Comprehensive Consumer Protection

Join Thousands Of Consumers Using A HIES Member

HIES was established to provide comprehensive protection for consumers purchasing renewable products. Our aim is to provide you with trust, confidence and peace of mind when purchasing energy saving, energy storage or energy generating products from one of our members. If you're thinking of purchasing renewable products, protect yourself and your investment and join thousands of consumers who have already used a HIES member.

Since our inception, we have seen over

81,000

consumers use a HIES member

81,559

consumers protected

Over

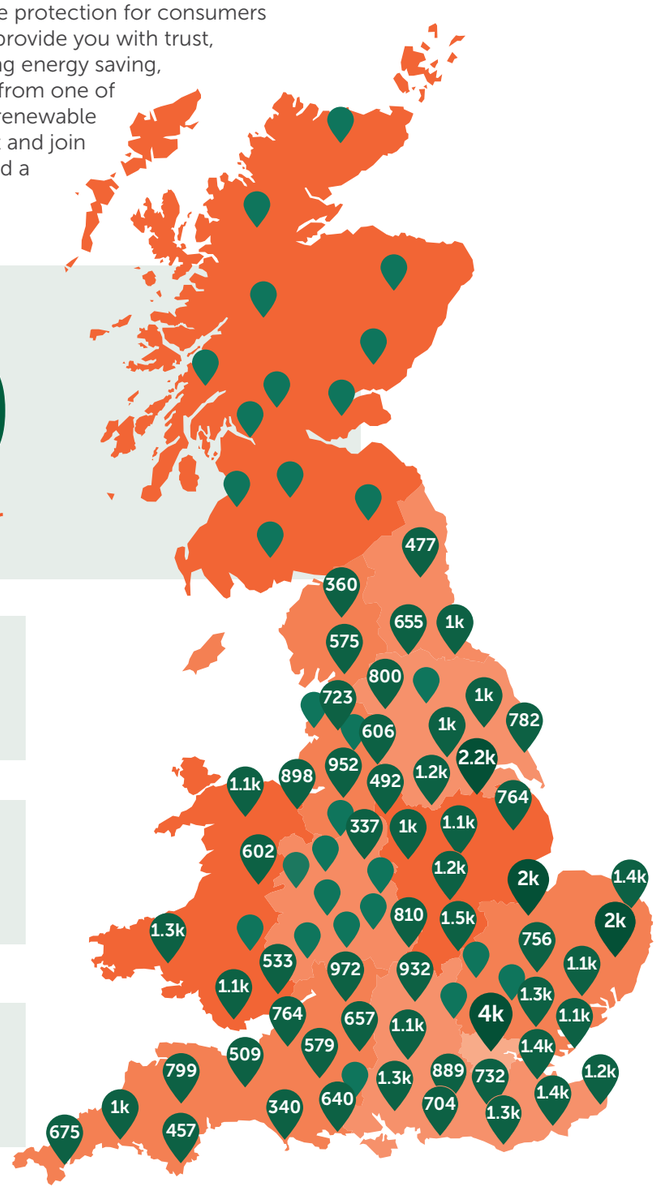
£650m

worth of contract value insured

Over

£42m

worth of deposits protected



10 Principles Of HIES

"Our aspiration is to deliver world class consumer protection for the renewable sector. I recommend our Scheme and scheme members to you. We will constantly work to maintain and enhance their standards and hold them to our own. I am delighted to be leading consumer protection for the Scheme which brings together the integrity and commitment needed to secure the best outcomes for consumers."

Tony Allen,
Director of Consumer Protection

The 10 Principles

Scheme members will:

1. act with professional integrity at all times;
2. treat their customers fairly and with respect;
3. be honest and truthful about the products and services they supply;
4. respect each customer's home;
5. provide clear and accessible information at all stages of the work they carry out;
6. offer clear rights for customers to change their mind;
7. professionally and competently deliver and install products;
8. protect customers' deposits and guarantees;
9. identify consumers with additional needs and provide appropriate support; and
10. recognise the value of effective complaint-handling systems.

Professional Integrity & Treating Consumers Fairly

PRINCIPLE 1

A: SCHEME MEMBERS MUST ACT WITH PROFESSIONAL INTEGRITY AT ALL TIMES

- A1 Members shall not bring HIES or this Code of Practice into disrepute.
- A2 Members shall make their true identity clear in all documentation provided to consumers and on any website that they operate.
- A3 Members shall be clear about and shall not misrepresent the status, position and qualifications of its partners, directors, management, staff or contractors.
- A4 Members must be adequately insured to cover their activities.
- A5 Members must, where required due to their activities, obtain and maintain authorisation by the Financial Conduct Authority (FCA).
- A6 Any membership, authorisation, award or recognition claimed by a member must be genuine and supported by evidence.

PRINCIPLE 2

B: SCHEME MEMBERS MUST TREAT CONSUMERS FAIRLY AND WITH RESPECT.

- B1 Members must act and behave fairly to consumers.
- B2 Members must protect personal information about consumers and may only use information fairly, in accordance with data protection principles; within the reasonable expectations of the person that the information is about and in accordance with their notification to the Information Commissioner's Office.
- B3 Members must disclose who they are in direct marketing calls, e-mails and campaigns and act responsibly.
- B4 Members must not engage in high pressure selling techniques.
- B5 Members must not discriminate or exclude consumers based on individual characteristics and circumstances, such as age; disability; caring or dependency responsibilities; gender or gender identity; marriage or civil partnership status; political opinion; pregnancy or maternity; race, colour, caste, nationality, ethnic or national origin; religion or belief; sexual orientation; or other distinctions.

Honest and Truthful & Respect Consumer's Homes

PRINCIPLE 3

C: SCHEME MEMBERS MUST BE HONEST AND TRUTHFUL ABOUT THE PRODUCTS AND SERVICES THEY SUPPLY.

C1 Members must describe, advertise and sell their products in a manner which is legal, decent, honest and truthful.

C2 Members must comply with any additional requirements related to specific products or services as set out in the Annexes to this Code of Practice.

C3 Members must comply with all statutory requirements in relation to sales including, but not limited to, the Consumer Protection from Unfair Trading Regulations 2008 and the FCA Consumer Credit Sourcebook.

PRINCIPLE 4

D: SCHEME MEMBERS MUST RESPECT EACH CONSUMER'S HOME.

D1 Members must respect the sanctity of a consumer's home.

D2 Members must respect any expressed wish that consumers do not accept cold calling at their home and must not exploit consumers through cold calling.

D3 Members must take action to safeguard children when their staff are in a consumers' home.

D4 Members must take precautions to prevent damage to the consumers' home.

Clear and Accessible Information & Cancellation Rights for Consumers

PRINCIPLE 5

E: SCHEME MEMBERS MUST PROVIDE CLEAR AND ACCESSIBLE INFORMATION AT ALL STAGES OF THE WORK THEY CARRY OUT.

E1 Members must provide clear and accessible pre-contractual information to enable the consumer to make an informed purchasing decision.

E2 Members supplying goods or services on credit agreements must comply with all documentary requirements of the FCA Sourcebook on Consumer Credit.

E3 Members must provide a clear installation plan, which should make allowance for the requirements and limitations of the consumer.

E4 Members should carefully record any necessary or requested variations to contracts and these must be agreed and signed by the consumer.

E5 Members must make a completion of works record, which must be agreed and signed by the consumer.

PRINCIPLE 6

F: SCHEME MEMBERS MUST OFFER CLEAR RIGHTS FOR CONSUMERS TO CHANGE THEIR MIND.

F1 Members must provide consumers with a right to change their mind and cancel their contract unless the installation is in response to an emergency situation.

F2 Members must be clear with consumers about the consequences of exercising a right to change their mind at different stages of the installation process.

F3 Where a consumer exercises their right to change their mind, members must remove their goods from the property and leave it secure, safe and watertight.

F4 The balance of any deposits or refunds due to the consumer will be provided within 14 days and any linked agreements, such as credit agreements, will be cancelled provided suitable means to meet any fees payable have been secured.

Installation of Products & Deposit and Guarantee Protection

PRINCIPLE 7

G: SCHEME MEMBERS MUST PROFESSIONALLY AND COMPETENTLY DELIVER AND INSTALL PRODUCTS.

G1 Members must exercise reasonable care and skill when installing products.

G2 Members must carry out works to a high standard ensuring that products are fit for purpose.

G3 Members must supply safe products and ensure that they are safely installed.

G4 Members using sub-contractors are directly responsible for the standard and quality of the sub-contractors work as though they were direct employees of the member.

G5 Members must ensure that any waste generated during the installation is stored safely and removed from the site in accordance with the terms of the contract.

PRINCIPLE 8

H: SCHEME MEMBERS MUST PROTECT CONSUMERS' DEPOSITS AND GUARANTEES.

H1 Members must not take deposits or staged payments that exceed 25% of the total contract value without the prior written consent of the scheme administrator.

H2 Members must provide a Workmanship Guarantee, which must provide for a minimum of two years cover.

H3 Members must pass on any manufacturers guarantee applicable to the product and, where no such guarantee exists or is inadequate, must provide a Product Guarantee, which must provide for a minimum of two years cover.

Additional Needs & Complaint Handling

PRINCIPLE 9

I: SCHEME MEMBERS MUST IDENTIFY CONSUMERS WITH ADDITIONAL NEEDS AND PROVIDE APPROPRIATE SUPPORT.

I1 Members must attempt to identify any consumers with additional needs or who, by their circumstances, may be potentially vulnerable customers and deal with them sympathetically and appropriately.

I2 Where a consumer is identified as vulnerable or with additional needs, members must make reasonable adjustments to their service offer to meet those additional needs or adequately address the vulnerability.

I3 Members must have an adequate policy to ensure that information can be provided in an alternative format for customers with additional needs where necessary, e.g. other languages, large font, brail, audio or to advise such customers to read through documents with a trusted friend or relative.

PRINCIPLE 10

J: SCHEME MEMBERS MUST RECOGNISE THE VALUE OF EFFECTIVE COMPLAINT-HANDLING SYSTEMS.

J1 Members must make sure that consumers are provided with effective and appropriate customer service to include:

a. before a contract has been agreed
b. after placing an order
c. after booking
d. after paying
e. after the product has been installed

J2 Members must adequately train their staff to handle complaints and must nominate a person who is the designated complaints handler (or the leader of a team of complaints handlers if appropriate).

J3 All complaints must be dealt with professionally and courteously in strict compliance with the member's approved complaints procedure.

J4 If a customer or prospective customer wishes to make a formal complaint, the member shall ask for the details of the complaint to be set out in writing and addressed to the member's complaint handler in order to allow the scope of the complaint to be defined and to give the member the opportunity to respond and deal with specific issues.

ANNEX 1 SPECIFIC RULES FOR SCHEME MEMBERS

X1.1 Members must not make misleading or unjustified energy performance claims connected with any home insulation, energy saving or energy generation installations.

X1.2 Members must not make misleading statements in connection with the provision of free, subsidised, rental or buy-back energy or heat generating equipment or energy saving equipment.

hies

Home Insulation & Energy Systems
Quality Assured Contractors Scheme

Centurion House
Leyland Buisness Park
Centurion Way, Farington
Leyland, Lancashire, PR25 3GR

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The Home Insulation and Energy Systems Quality Assured Contractors Scheme (HIES) is a division of The Integrity Foundation, a Company Limited by Guarantee. Registered address: Centurion House, Leyland Business Park, Centurion Way, Farington, Leyland, England, PR25 3GR. Registered in England (Company Number 07972075).

solis

Solis Three Phase Inverters

» S5-GR3P(3-20)K

360 degree

Efficient

- Max. efficiency 98.7%
- String current up to **16A**
- Wide voltage range and low startup voltage

Safe

- IP66
- AFCI protection, proactively reduces fire risk
- Automatic voltage stabilization technology in weak grid conditions

Smart

- Supports export power control
- Supports RS485, WiFi, GPRS
- Scan to register on SolisCloud, supports remote upgrade and control

Economic

- Compact design, simple installation and maintenance
- > 150% DC/AC ratio
- Supports high power modules for lower installation costs

Model:

S5-GR3P3K S5-GR3P4K S5-GR3P5K S5-GR3P6K S5-GR3P8K S5-GR3P9K S5-GR3P10K
S5-GR3P12K S5-GR3P13K S5-GR3P15K S5-GR3P17K S5-GR3P20K

Datasheet

Model Name	S5-GR3P3K	S5-GR3P4K	S5-GR3P5K	S5-GR3P6K	S5-GR3P8K	S5-GR3P9K	S5-GR3P10K	S5-GR3P12K	S5-GR3P13K	S5-GR3P15K	S5-GR3P17K	S5-GR3P20K
Input DC												
Recommended max. PV power	4.5 kW	6 kW	7.5 kW	9 kW	12 kW	13.5 kW	15 kW	18 kW	19.5 kW	22.5 kW	25.5 kW	30 kW
Max. input voltage	1100 V											
Rated voltage	600 V											
Start-up voltage	180 V											
MPPT voltage range	160-1000 V											
Max. input current	16 A / 16 A							32 A / 32 A				
Max. short circuit current	20 A / 20 A							40 A / 40 A				
MPPT number/Max. input strings number	2/2							2/4				
Output AC												
Rated output power	3 kW	4 kW	5 kW	6 kW	8 kW	9 kW	10 kW	12 kW	13 kW	15 kW	17 kW	20 kW
Max. apparent output power	3.3 kVA	4.4 kVA	5.5 kVA	6.6 kVA	8.8 kVA	9.9 kVA	11 kVA	13.2 kVA	14.3 kVA	16.5 kVA	18.7 kVA	22 kVA
Max. output power	3.3 kW	4.4 kW	5.5 kW	6.6 kW	8.8 kW	9.9 kW	11 kW	13.2 kW	14.3 kW	16.5 kW	18.7 kW	22 kW
Rated grid voltage	3/N/PE, 220 V / 380 V, 230 V / 400 V											
Rated grid frequency	50 Hz / 60 Hz											
Rated grid output current	4.6 A / 4.3 A	6.1 A / 5.8 A	7.6 A / 7.2 A	9.1 A / 8.7 A	12.2 A / 11.5 A	13.7 A / 13.0 A	15.2 A / 14.4 A	18.2 A / 17.3 A	19.8 A / 18.8 A	22.8 A / 21.7 A	25.8 A / 24.6 A	30.4 A / 28.9 A
Max. output current	4.7 A	6.4 A	7.9 A	9.5 A	12.7 A	14.3 A	15.9 A	19.1 A	20.7 A	23.8 A	27 A	31.8 A
Power Factor	>0.99 (0.8 leading - 0.8 lagging)											
THDi	<2%											
Efficiency												
Max. efficiency	98.3%				98.5%			98.6%			98.7%	
EU efficiency	97.7%				97.9%			98.0%			98.1%	
Protection												
DC reverse-polarity protection	Yes											
Short circuit protection	Yes											
Output over current protection	Yes											
Surge protection	Yes											
Grid monitoring	Yes											
Anti-islanding protection	Yes											
Temperature protection	Yes											
Integrated AFCI (DC arc-fault circuit protection)	Yes (1)											
Integrated DC switch	Optional											
General Data												
Dimensions (W*H*D)	310*563*219 mm											
Weight	17.8 kg								18.8 kg		20 kg	
Topology	Transformerless											
Self consumption (night)	<1 W											
Operating ambient temperature range	-25 ~ +60°C											
Relative humidity	0-100%											
Ingress protection	IP66											
Cooling concept	Natural convection							Intelligent redundant fan-cooling				
Max. operation altitude	4000 m											
Grid connection standard	G98 or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15 / VFR:2019, RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530											
Safety/EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-1/-2/-3/-4											
Features												
DC connection	MC4 connector											
AC connection	Quick connection plug											
Display	LCD											
Communication	RS485, Optional: Wi-Fi, GPRS											

(1) Activation required.

APPENDIX D

COLLINS FIRE STRATEGY

Review of Fire Strategy Drawings.

3 or 4 storey Block 67 Morrab Road Penzance Cornwall TR18 2QJ

Author: David Collins MIFireE MIFPO MIFSM Eng Tech

Contents

Introduction

This report is a review of fire strategy drawings provided for the refurbishment of 67 Morrab Road, Penzance, Cornwall, TR18 2QJ from an office space to a mix use building - residential above commercial. It is proposed to provide a `shell build` commercial units on the ground floor and two residential floors on the 1st and 2nd floors, each floor is to provide one residential apartment. At present the 3rd floor is proposed to be an open communal roof terrace with space for the building plant room. It is noted that the roof terrace is at present only a concept and may not be undertaken.

This report has been produced at the request of Mr. James Smith who is a Director for JS Construction Solutions LTD in support of demonstrating compliance with Building Regulations and the Regulatory Reform (Fire Safety) Order 2005. More specifically, it has been produced to assist in identifying any risks that might require remedial measures during the design stage or management of the premises when occupied when considering the nature of the proposed occupancy and/or processes undertaken. It is recommended that any measures that are identified within this report should be considered for incorporation into the design of the building and any control measures required to be applied are passed to the end user under Regulation 38. This report is a review of the fire strategy drawings provided and not a fire strategy for the building.

This report deals only with Statutory Requirements, and property protection is not, therefore, explicitly addressed, unless otherwise stated. As such, it is recommended that the building insurers are consulted at an early stage to ensure that any additional needs are satisfied. The comments within this report are made in support of the requirements of the Regulatory Reform (Fire Safety) Order 2005 (the Fire Safety Order) and form part of the pre-construction assessment of fire risk including confirming the level of compartmentation, an adequate means of escape and the fire service access. The comments within this report relate to the following supplied drawings and information supplied.

- Proposed Fire strategy Floor Plan (Ground, 1st and 2nd floors): 20.81 012 dated January 2021.
- Proposed Roof Structure Options: 20.81 014 dated January 2021.
- Proposed Elevations: 20.81 008 dated January 2021.
- Preconstruction Team Meeting Minutes (No 4) dated 29.01.2021.

Compliance with the Building Regulations 2010, in respect to means of giving warning and escape in case of fire, will normally ensure compliance with the requirements of the Regulatory Reform (Fire Safety) Order. In order to demonstrate compliance with Building Regulations and the Fire Safety Order (FSO), the guidance documents applied are Approved Document B Volume 2:2019 incorporating 2020 amendments – Buildings other than dwellings (ADB V2:2020) for the commercial

areas, Approved Document B Volume 1:2019 incorporating 2020 amendments - Dwellings (ADB V1:2020) for the residential areas including the communal areas, where additional supporting information is required BS 9991:2015 (Fire safety in the design, management and use of residential buildings) has been referenced.

The drawings contained within this report have been copied or extracted from those forwarded by JS Construction Solutions LTD on behalf of PMR Architects, unless otherwise stated. Where Collins Fire Consultants (CFC) has added markings or comments to any drawings, this is clear in the relevant section of this report.

The classification within ADB for the user groups are:

- Ground floor shop/café: Purpose Group 4: Shops or premises used for retail trade or business including selling food or drink to the public for immediate consumption.
- 1st and 2nd floors: Purpose Group 1 (a): Residential (dwellings) - Flat.
- The premises occupancy characteristic within BS 9991 is General needs - Housing with no special features.

Although it is recognized that the residential block occupancy characteristic is General Needs, it is recommended that BS 9266:2013 (Design of accessible and adaptable general needs housing) and BS 8300-2:2018 (Design of an accessible and inclusive built environment) should be considered at the design stage in order to assist in reducing costs if occupants require supported living within their homes at a later date.

BS 9266:2013 gives recommendations for the design of accessible and adaptable general needs housing, whether in the form of apartments or individual houses. It specifically addresses: car parking, external access routes to blocks of apartments or individual houses, common circulation areas in blocks of apartments, circulation areas within dwellings, and the provision of key rooms and facilities. BS 9266:2013 is intended to be used for new dwellings that are designed to be accessible and adaptable.

BS 8300-2:2018 gives recommendations for the internal layout of buildings including the common parts of blocks of residential apartments

Any recommendations within this report are subject to issue and approval by the Authority's Having Jurisdiction (AHJ`s).

The information contained in this document is the copyright of Collins Fire Consultants Ltd and only applies to 67 Morrab Road, Penzance, Cornwall, TR18 2QJ. The contents of the document must not be used in support of any other project without the written agreement of Collins Fire Consultants Ltd. This document may only be forwarded to a third party if reproduced in full and without amendment to the contents. The report represents only the best judgement of the consultant involved

in its preparation, and is based, in part, on information provided by others, therefore no liability whatsoever is accepted for the accuracy of such information.

Fire Detection and Alarm Systems

The drawings do not illustrate any fire alarm or detection systems. Therefore the design team should consider the following:

Ground floor – Commercial

The commercial areas are a large café/shop on the South elevation and a small shop on the North elevation. The commercial areas are to be refurbished as a `shell` project and the new occupiers are to apply the current Building Regulations during the `fit-out`.

During the refit the large café should consider the installation of a fire alarm because it has multiple rooms and shouting fire probably would not be adequate to raise the alarm in case of fire. Depending on the final occupancy a Category M system i.e. a manual electrical fire alarm iaw BS 5839-1:2017 would be adequate. Manual Call Points (MCP`s) and no smoke detection (unless for property protection). MCP`s should be located on the escape routes at the final front and rear exits that lead to a place of ultimate safety, see figure 1.

I. The travel distance to a MCP should not exceed 45m.
II. MCP`s should be fixed at a height approx. 1.4m from the finished floor.
III. All the MCPs should be fitted with a protective cover, which can be moved to gain access to the frangible element.

The sound pressure of the fire alarm for the large café/shop should be at least 65 dB(A) or at least 5 dB(A) above the background noise. Any Visual Aid Devices (VADs) should be provided on risk assessment i.e. persons who may have a hearing impairment and/or remote/alone. The most likely place for a VAD would be the ground floor toilet especially if this is to be used by members of the public, if this is the case it should be connected to the communal fire alarm as an incident in the communal areas would affect the escape route from the toilet, but there should be a management procedure to confirm that the toilet has been evacuated if the shop or café is evacuated.

Due to the size of the shop on the North elevation shouting fire would be sufficient to raise the alarm in case of fire.

Any fire alarms within the commercial areas should be standalone and not be interconnected with the fire alarms/detection of the residential areas.

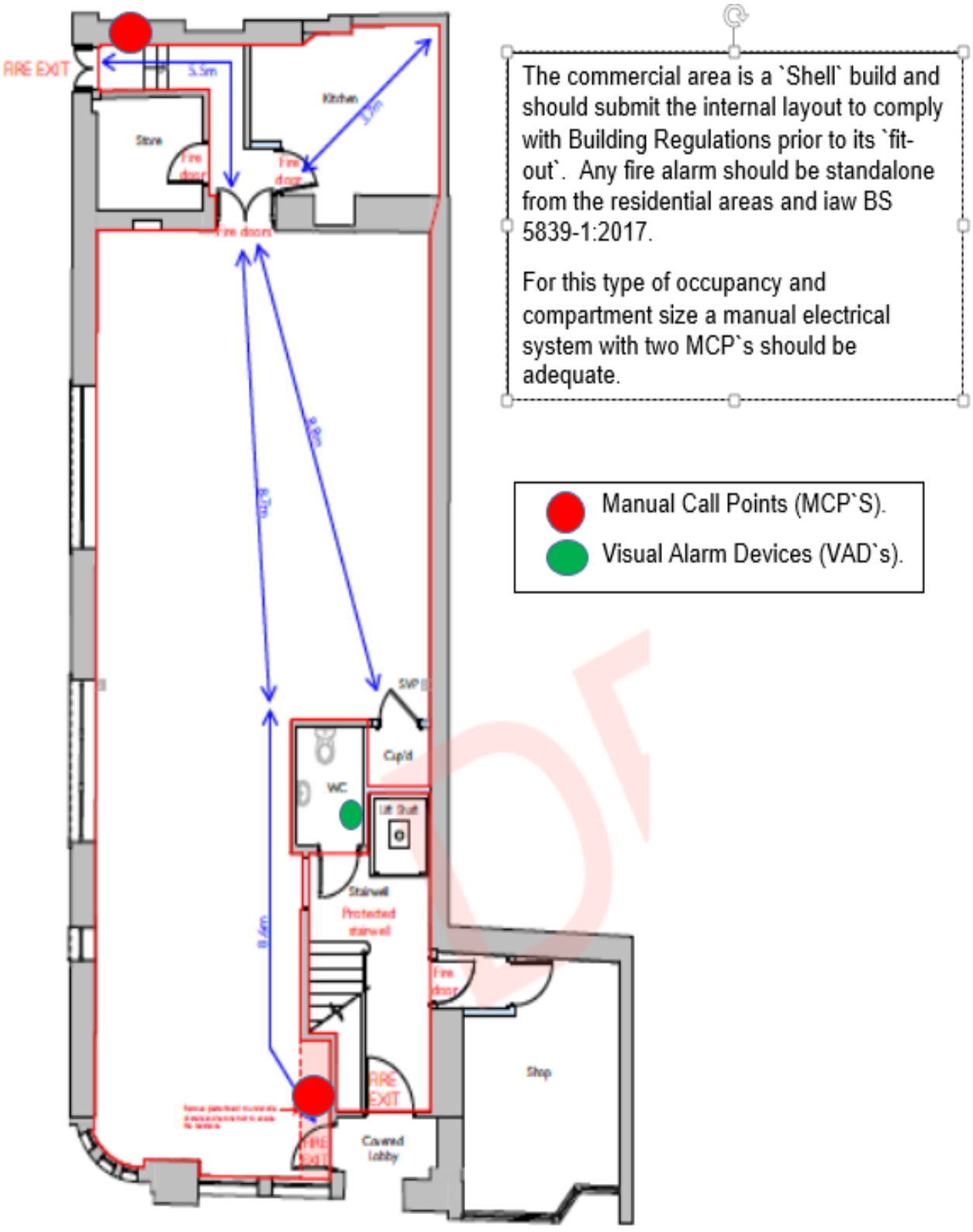

Figure 1: Fire Alarm – Commercial Areas.

Apartments

ADB requires all new apartments to be provided with fire detection in accordance with BS 5839-6 to a minimum Grade D2 Category LD3 standard iaw BS 5838-6. BS 9991:2015 states a fire detection and fire alarm system designed and installed iaw BS 5839-6:2013 (updated BS 5839-6:2019+A1:2020) should be provided in all dwellings, in order to warn occupants of fire within the dwelling and to provide them with time to evacuate the premises and to call the fire and rescue service.

BS 5839-6:2019+A1:2020 states that the minimum standard is a Grade D2 to a LD2. Smoke alarms should normally be positioned in the circulation spaces between sleeping spaces and places where fires are most likely to start (e.g. kitchens and living rooms) to detect smoke in the early stages of fire development and a heat detector within the cooking area.

It is recommended that a BS 5839-6:2019+A1:2020 Grade D2 LD2 fire detection system (smoke detection in the hallway and a heat detection within the cooking area) is provided for the 1st floor apartment and as the 2nd floor apartment has a hybrid system of open-plan (studio apartment type with a bedroom off the living area) and a protected entrance hall way the fire detection system would normally be a LD1 system but due to the hybrid system it would be reasonable to provide a Grade D2 LD2 fire detection system (smoke detection in the hallway and `studio` bedroom (NY bedroom), a multi-sensor (heat and smoke) in the lounge and a heat detection within the cooking area), see figure 2. **This should be discussed and agreed with the AHJ`s** to reduce the fire detection system from a LD1 to a LD2 system, if the location of the `studio` bedroom (NY bedroom) is moved so access is via the protected entrance hallway then a LD2 system is only required.

If the apartments are to be rented a Grade D1 system is recommended. A Grade D1 system is one or more mains-powered detectors, each with a tamper proof standby supply consisting of a battery or batteries.

It should be noted that the smoke detection within the apartment should be interconnected but not connected to any fire detection outside the individual apartment.

The sound pressure level of fire alarm signals should be iaw BS 5839-6:2019+A12020, as measured at the doorway of each bedroom (with the door open), should be at least 85 dB(A), irrespective of where fire is detected in the dwelling with an alarm frequency below 3 500 Hz.

Figure 2: Fire Alarm – Residential Areas.

Communal Areas

A fire/smoke alarm system is not normally required within the residential communal areas of a general needs purpose built apartment block except where smoke detection is required to operate the Automatic Opening Vents (AOV) at the head of

the stairs. If the roof terrace is provided an alarm sounder is required to be provided for the roof terrace.

It is recommended that a BS 5839-1:2017 fire alarm system is provided to at least a L5 standard, smoke detection only within the residential communal area to control the smoke ventilation (AOV at the head of the stair enclosure), the smoke detection heads should be provided within 1.5m from the lift landing doors and at the head of the stairs. Sounders are not required within the stair enclosure but a sounder/VAD should be provided for the roof terrace and ground floor toilet with a sound level of at least 65 dB(A) or at least 5 dB(A) above the background noise. Base units containing both VAD`s and sounders can be used, but should not be mounted less than 2.1m from the floor. MCP`s are also not required for the communal areas of the residential areas.

The fire panel should be located near to the Fire Service Access Level (FSAL) on the ground floor or it would be reasonable that the smoke detection heads are connected directly to a smoke control panel for the AOV.

All cabling should be of the low smoke zero halogen type and all cables associated with the fire alarm system should be of an enhanced grade as defined by BS 5839 and should be installed as a Category 3 cable as defined by BS 7671:2018+A1:2020.

Cause and Effect

The communal fire alarm is to control the smoke ventilation system (AOV), to recall the lift to the ground floor and sound the alarm within the roof terrace. The `cause and effects` of the communal fire alarm should be configured at present to:

- On activation of the communal fire detection the AOV at the head of the smoke shaft should open. It should be considered that as the building is not to be provided with permanent staff that the smoke detectors should be non-latching. Therefore, if there is a false alarm the detection heads will clear and the AOVs will power closed. This will reduce any potential water damage from rainwater caused by AOVs being left in the open position for long periods of time.
- On activation of the communal smoke detection the passenger lift within that core should iaw BS EN 81:73:2016 be recalled to the ground floor and taken out of service until the fire alarm is reset.
- On activation of the communal fire detection the sounder/VAD within the ground floor toilet and roof terrace should sound the alarm.

Means of Escape

The means of escape will be based on adopting a ‘stay put’ fire evacuation strategy for the residential areas, where only the residents of the affected apartment is required to escape. The commercial areas should adopt a simultaneous evacuation.

Apartments

Due to the height of the ceilings the 1st floor is 5.539m above the sloping ground level on the South elevation, therefore the evacuation is based on buildings over 4.5m above the ground level. The travel distances within the 1st and 2nd floor apartments are over 9m, therefore they have been provided with protected entrance hallways, see figure 3.

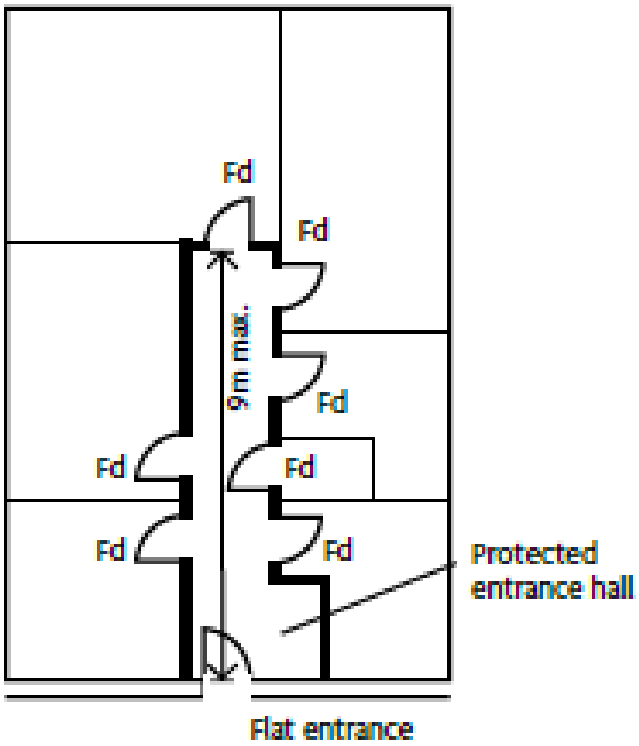

Figure 3: Protected Entrance Hallways.

The 1st floor apartment has a protected entrance hallway, where both bedrooms are accessed via the protected entrance hallway. At present the two `office` locations do not have any doors, so they are not treated as inner rooms to the kitchen/lounge/diner if the wall above the doorway to the offices is level with the ceiling height. Iaw BS 9991:2015, the offices could be provided with doors if the apartment is provided with a BS 5839-6:2019+A1:2020 Grade D1 LD1 smoke detection (it would be reasonable as the apartment is provided with a protected entrance hallway that the smoke detection is similar to the apartment on the 2nd floor) and sprinklers (see sprinkler section), see figure 4. **This should be discussed and agreed with the AHJ`s.**

Both the bathroom and WC should be provided with fire doors within the protected entrance hallway or the bathroom and WC are separated from the other habitable rooms with 30 minutes fire resistance, see figure 4a.

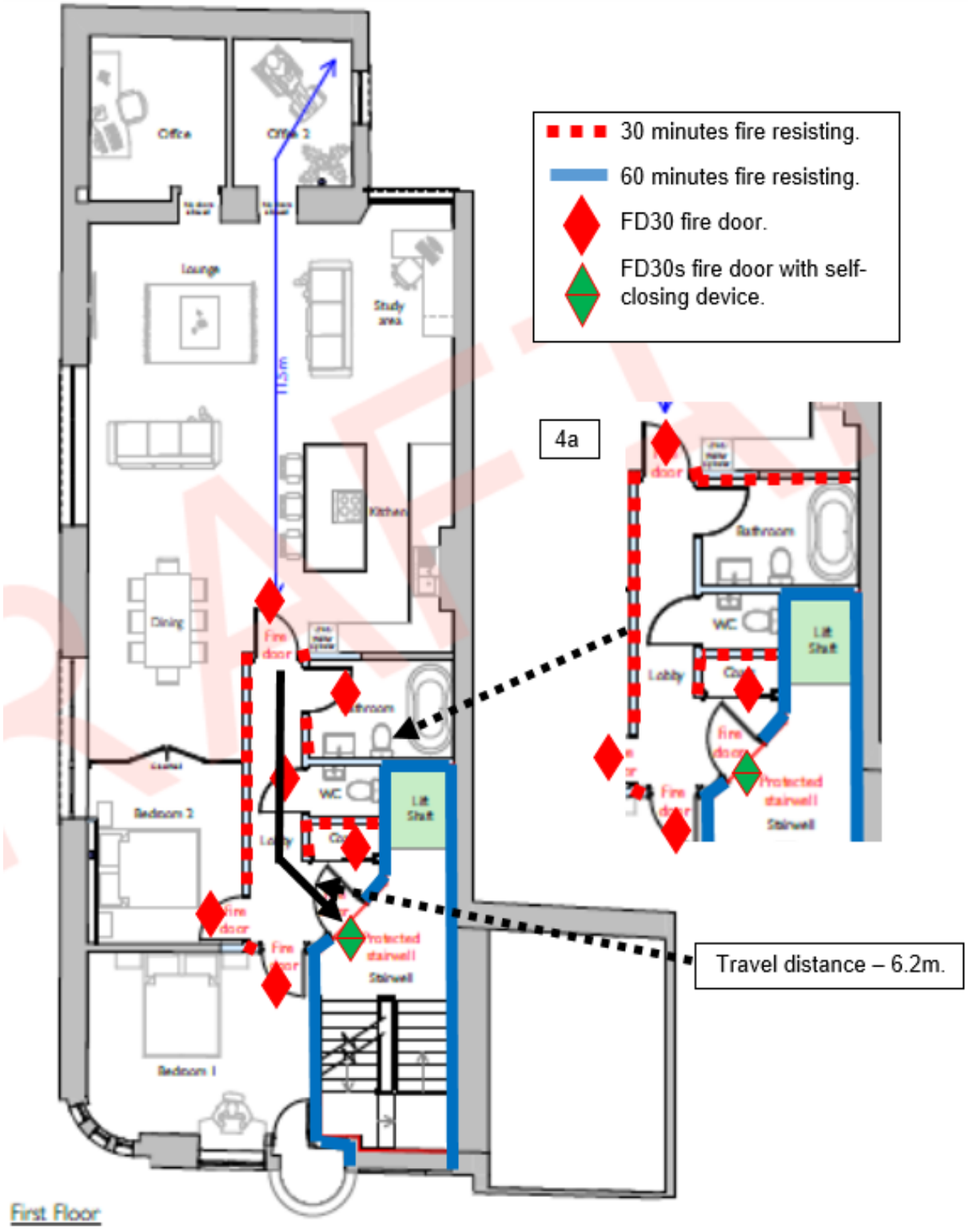

Figure 4: 1st Floor Protected Entrance Hallway.

The 2nd floor apartment has a protected entrance hallway, but also has a `studio` type bedroom indicated on the drawing as `NY bedroom`, see figure 5.

Both the bathroom and WC should be provided with fire doors within the protected entrance hallway or the bathroom and WC are separated from the other habitable rooms with 30 minutes fire resistance, see figure 5a.

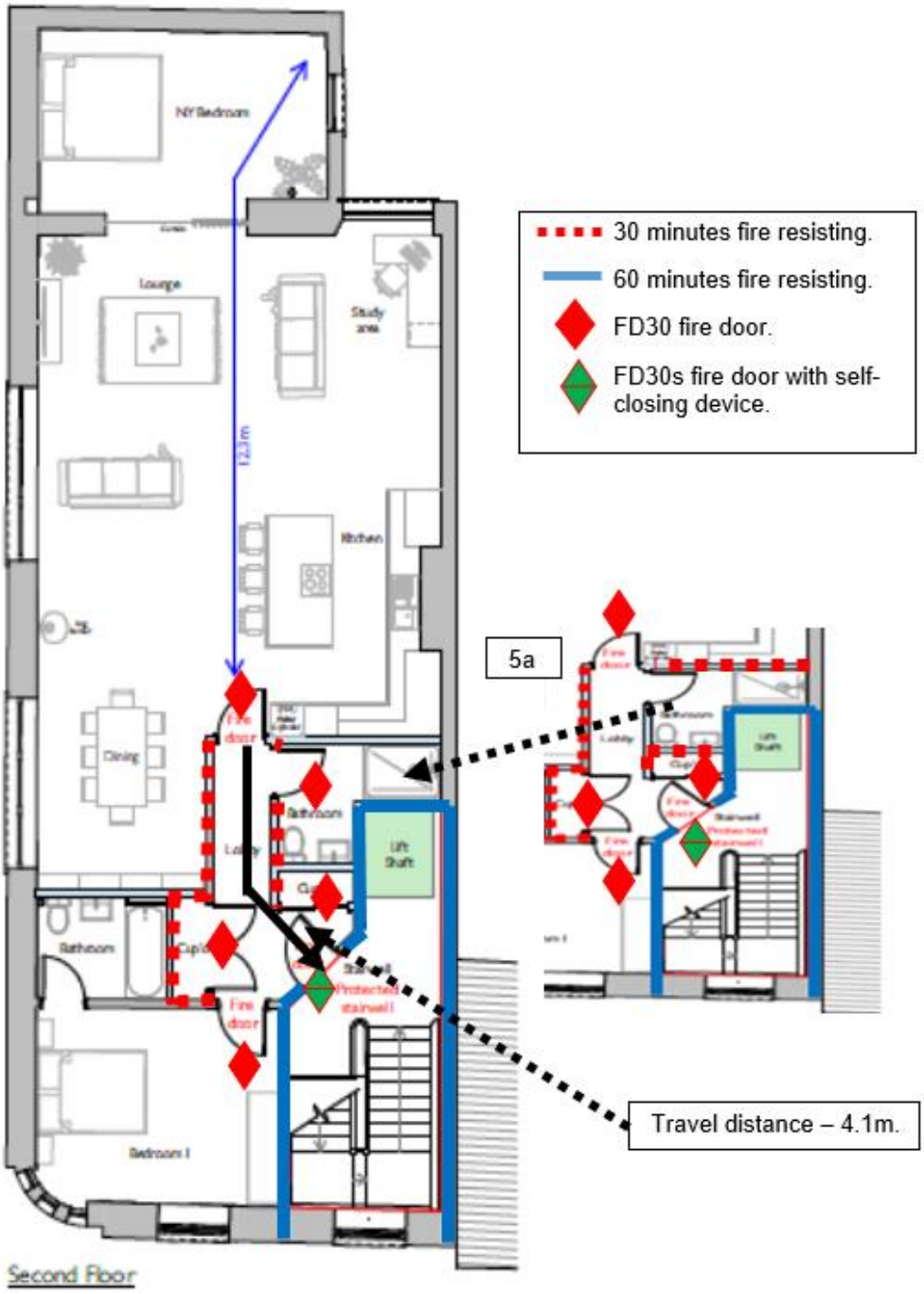

Figure 5: 2nd Floor Protected Entrance Hallway.

As the 2nd floor has a `NY Bedroom` although not listed within ADB V1:2020, it should be considered as a `studio apartment` where a bedroom is not separated from the main living space. It is noted however that the apartment is provided with a protected entrance hallway, so it's a bit of a hybrid solution. The issues are the travel distance from the `studio` bedroom is over 9m to a place of relative safety (the protected entrance hallway), the travel distance within the lounge/dining/kitchen/bedroom would be compliant if the bedroom was not in the living space but the bedroom is within the main habitable room.

Either the location of the bedroom should be changed i.e. the studio bedroom (NY bedroom) repositioned so access/egress from the bedroom is via the protected entrance hallway like the 1st floor or the apartment should be provided with a BS 5839-6:2019+A1:20202 smoke detection similar to figure 2 (2nd floor) and a sprinkler system iaw BS 9251:2014 Category 1, see sprinkler section. If the sprinkler option is applied it would be reasonable that the bedroom is provided with a wall and door to separate it from the living space. **This should be discussed and agreed with the AHJ`s.**

The cooking facilities are remote from the entrance to the protected entrance hallway door i.e. over 2300mm from the hob (1800mm distance and 500mm for the person) and with sprinklers the travel distance can be increase to 20m.

Communal Areas

In mixed use buildings, separate means of escape should be provided from any storeys or parts of storeys used for the 'residential' groups other than in the case of certain small single stair buildings or buildings in which the residential accommodation is ancillary. Buildings with a maximum of three storeys above the ground storey (below 11m), stairs may serve both flats and other occupancies, provided that the stairs are separated from each occupancy by protected lobbies (minimum REI 30) at each storey. The current layout of the building has no lobbies on the 1st and 2nd floor and is over 11m if the roof terrace is provided.

A small single stair building should conform to both of the below:

I. The top storey of the building is a maximum of 11m above ground level.

II. No more than three storeys are above the ground storey.

It appears that the drawing provided has used the small single stair building standards, see figure 6. This would be reasonable if the roof terrace is not provided as the building would be under 11m and under 3 storeys above the ground level. The apartments could open directly into the stairs as long as the apartments have a protected entrance hallway and has an Automatic Open Vent (AOV) at the head of the stairs providing at least 1.0m^2 (free area). The AOV should be as high a level as is practicable on the top storey of the stair or at least above the top of the entrance door to the 2nd floor apartment.

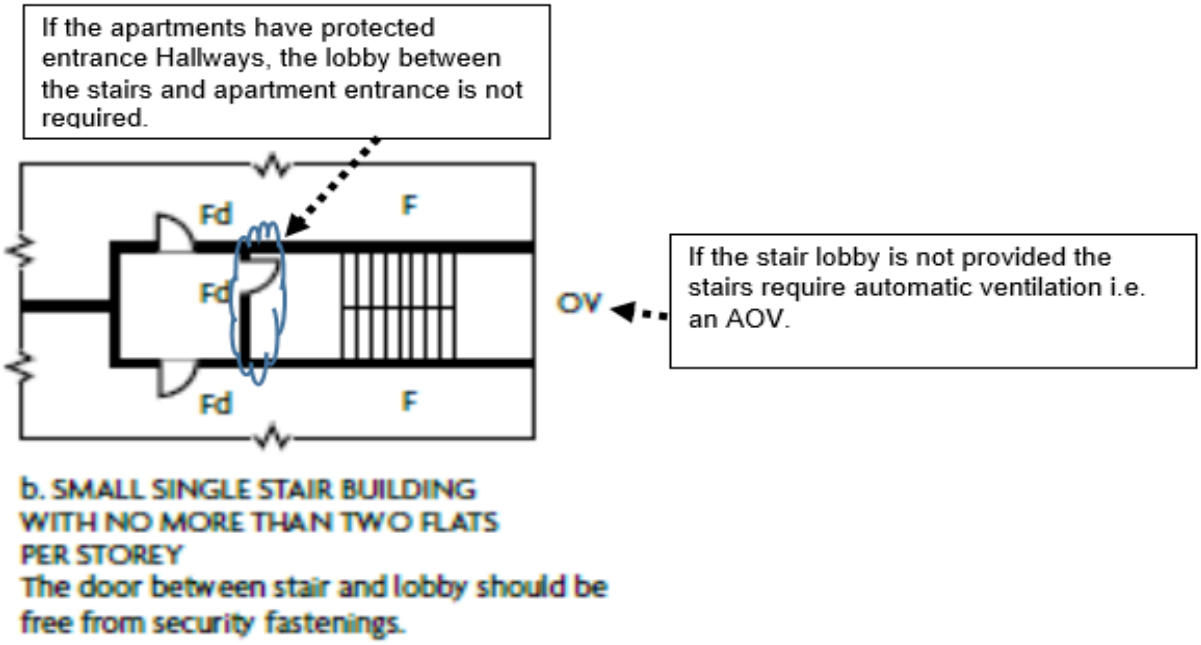

Figure 6: Single Stair Small Building Layout.

As you can see from the drawing provided the layout is in keeping with a single stair small building with protected entrance hallways and no stair lobby doors, see figure 7.

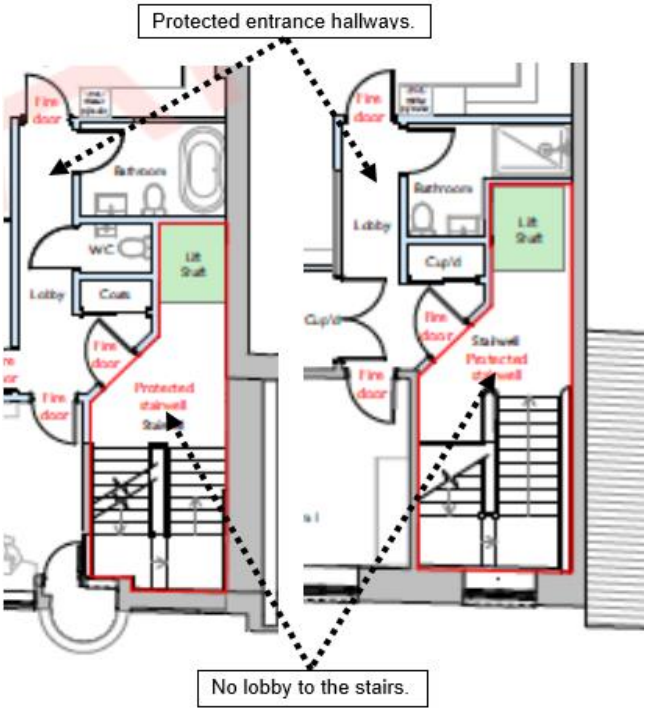

Figure 7: Layout of the 1st and 2nd Floor Communal Escape.

But if the roof terrace is provided the building would be over 11m and a lobby would be required on each floor (as well as sprinkler protection for the two apartments). It is noted that if the roof terrace is to be used the building will be over 11m in height (13.08m) although below the 3 storeys permitted above ground level, therefore the small single stair building guidance cannot be applied and the guidance for apartments more than 4.5m (11m) above the ground level should be applied.

This will then require each residential floor to be separated by a ventilated lobby from the stairs, this can be via a vent direct to an external wall or a vertical smoke shaft. The ventilation of the lobby should provide at least 1m^2 free area ventilation, see figure 8.

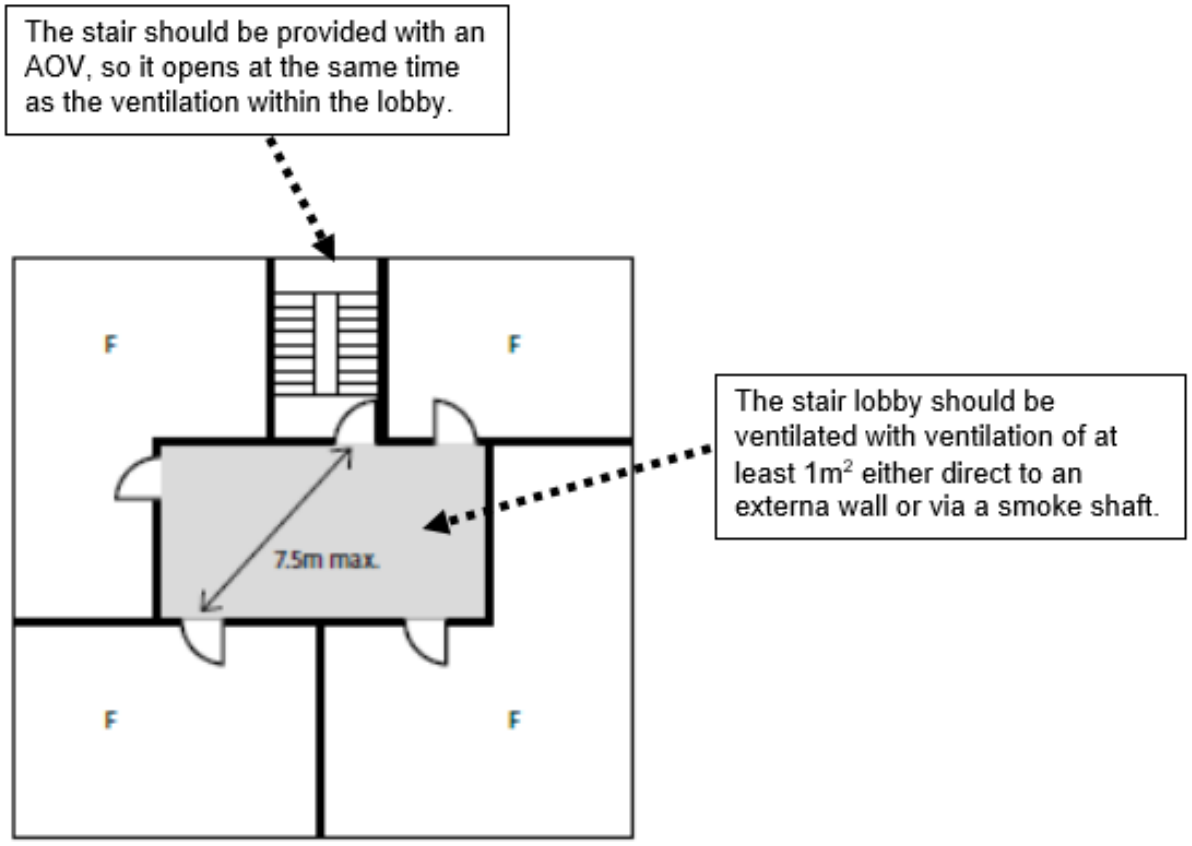

Figure 8: Single Stair building over 11m.

Therefore if no roof terrace is provided then the single stair small building standards can be applied i.e. protected entrance hallways and no stair lobby. But if the roof terrace is provided then sprinklers and stair lobbies are required as the building will be over 11m in height from the ground level.

Commercial

In mixed use buildings, separate means of escape should be provided from any storeys or parts of storeys used for the 'residential' groups. The small shop at present has a lobby into the base of the stairs to the residential accommodation, see figure 6. Therefore either:

a) If the roof terrace is not provided (the building is under 11m) the shop and each floor should be provided with a lobby separating the stairs from each occupancy or the small shop access/egress should be moved out of the stair enclosure, then lobbies are not required.
Or
b) If the roof terrace is provided (the building is over 11m) the access to the shop should be moved so it does not use the communal stairs i.e. direct from outside and the stairs should be provided with a lobby on each floor.

The main door from the large café should be an FD60s self-closing fire door as the escape route from the residential areas passes adjacent to the café exit door. The reason the café door is an FD60s door is it separates the means of escape from different occupancies, see figure 9.

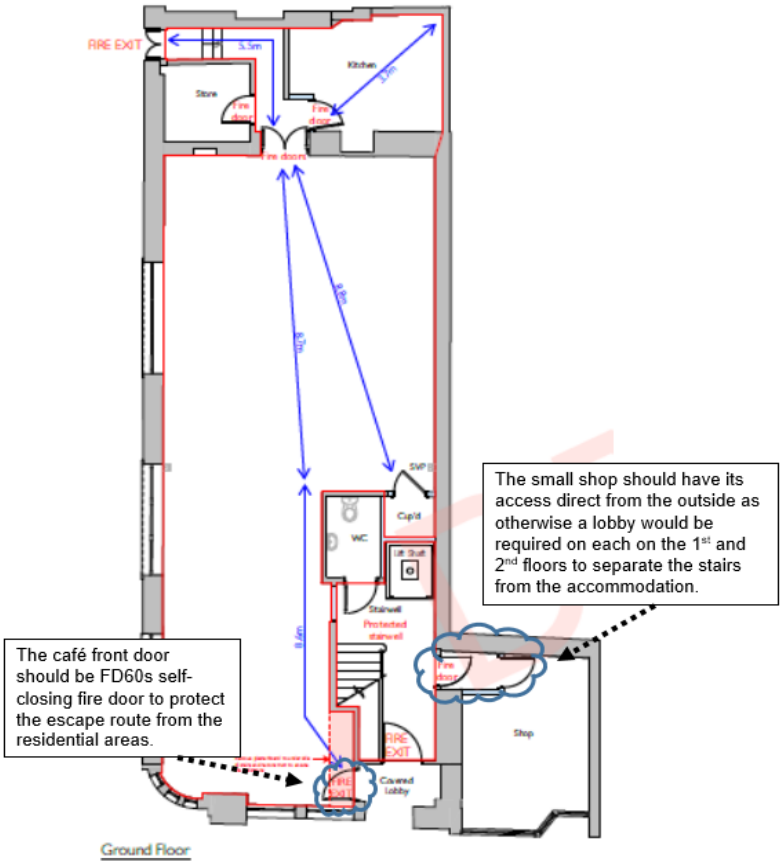

Figure 9: Access to the Commercial Areas.

Stairs and Final Exits

The stair widths in premises provided for day-to-day use will generally be adequate for means of escape. The stairs are over 1100mm in width, ADB has a permitted minimum of 800mm and therefore the stair width is adequate. The stairs serving the premises should be enclosed in fire resisting construction with an equivalent period of fire resistance to that designated for the building frame according to its height. The stairs should be enclosed with at least 60 minutes fire resistance. The stair core does not have any internal angles which may affect the escape stairs.

The final exits should have a level threshold. The final exit from the stair enclosure is inward opening, it would be best practise for the doors to open outwards but as the occupancy is below 60 persons it would be reasonable that the doors are inward opening.

The main door access system is not known, if the access/egress doors are provided with a door entry system, a simple fastening that can be operated from the escape side of the door without the use of a key (push button, push/pull pad or thumb turn security devices) should be provided. Any access doors provided with an electrical security systems should default to the open position on failure of the electrical power.

Sprinklers

For compliance with Building Regulations ADB V1:2020 blocks of flats with a top storey more than 11m above ground level should be fitted with a sprinkler system throughout the building. Sprinklers should be provided within the individual flats and not within the common areas such as stairs, corridors or landings as these areas should be fire sterile.

Therefore if the roof terrace is not provided sprinklers are not required as the building would be under the trigger height of 11m. A point to note is if the layout of the 2nd floor apartment is not changed and is kept as a `studio` apartment (NY bedroom) sprinklers should be provided for the 2nd floor apartment as a compensatory feature.

Sprinklers should be provided iaw BS 9251:2014, although it is noted that BS 9251 is out for public consultation 2020 but with no date for its release, the main revisions are trigger heights of buildings, design density and guidance on water supplies.

If sprinklers are provided for the 2nd floor apartment only as a compensatory feature for the `studio` bedroom iaw BS 9991:2015 Table 2, a design statement should be drafted normally by the installer, but it should consider BS 9251:2014 Table 1 and 2 to Category 1 standard (the new update 2020 which has not been published as yet would also be a Category 1 system).

I. Discharge density: 2.80mm/min, as the sprinkler is installed as a compensatory feature.
II. Sprinkler heads: 1 or 2.

III. Minimum duration of supply: 10.
IV. Minimum operating pressure: 0.5 bar.
V. Minimum flow: 40 L/min.
VI. The temperature rating of the sprinkler head should be 20^0c above the highest anticipated ambient temperature for the location, normally between 57^0c to 77^0c. It would be reasonable that the concealed sprinkler cover plates falls away at 57^0c and the sprinkler heads will operate at 68^0c.
VII. The maximum area protected by each sprinkler should be in accordance with its approved listing performance or 25 m^2, whichever is the lesser.
VIII. The whole of the floor area and the walls from the floor up to 0.7 m below the ceiling should be wetted when the sprinklers are operated.
IX. Sprinkler protection should be provided in all parts of the apartments; however, it would be reasonable to exclude.
    a) Bathrooms with a floor area of less than 5 m^2.
    b) Cupboards with a floor area of less than 2 m^2 or where the shortest dimension does not exceed 1 m.

If the roof terrace is provided, then the building would be over 11m in height from the ground level so sprinklers would be required to comply with ADB V1:2020. The sprinkler system should be iaw BS 9251:2014, as previously stated BS 9251 is in the process of being updated. The current standard would be for both residential apartments to be provided with a Category 1 system, as above. It should be noted that the proposed update to BS 9251:2020 requires where the majority of the apartments are provided with sprinklers the system should be a Category 2 system. The main difference is the duration time and design density, a Category 1 has a duration of 10 minutes and a Category 2 system has a duration of 30 minutes.

I. Discharge density: 2.04mm/min (Update Category 2 - 2.80mm/min).
II. Sprinkler heads: 1 or 2.
III. Minimum duration of supply: 10. (Update Category 2 – 30 minutes).
IV. Minimum operating pressure: 0.5 bar.
V. Minimum flow: 40 L/min.
VI. The temperature rating of the sprinkler head should be 20^0c above the highest anticipated ambient temperature for the location, normally between 57^0c to 77^0c. It would be reasonable that the concealed sprinkler cover plates falls away at 57^0c and the sprinkler heads will operate at 68^0c.
VII. The maximum area protected by each sprinkler should be in accordance with its approved listing performance or 25 m^2, whichever is the lesser.

VIII. The whole of the floor area and the walls from the floor up to 0.7 m below the ceiling should be wetted when the sprinklers are operated.
IX. Sprinkler protection should be provided in all parts of the apartments; however, it would be reasonable to exclude.
X. Bathrooms with a floor area of less than 5 m^2.
XI. Cupboards with a floor area of less than 2 m^2 or where the shortest dimension does not exceed 1 m.

Obviously applying the current standard of a Category 1 system would only require a minimum of a 10 minute duration which would be easier to provide especially if via a stored water tank.

The water supplies should be installed to meet the required outputs of Table 2 within BS 9251:2014 and the sprinkler design document. Generally there are two solutions:

1) Town mains: There are two types of town mains,

    I. Mains pressure only;
    II. Mains water supply boosted by a pump.

These options may not be a solution as it is believed that the water supplies to the building are not particularly strong. With these type of water supply systems it should be confirmed that the design density and duration can be achieved at maximum water demand or a priority valve should be considered to isolate other domestic water supplies to the building. Where water is drawn from a public mains supply, approval from the water undertaker should be sought at the earliest stage.

2) Stored water supply: There are two solutions;

    I. A dedicated tank: The volume of a stored water supply should be large enough to ensure that the effective capacity of the stored supply is sufficient for the duration for the category of the system.
    II. Sharing the domestic tank supply: The volume of stored water should be capable of providing:

        a) The building's peak demand for the required duration of the sprinkler system's run time, a priority valve isolating the domestic supply on activation of the sprinkler system can also be considered and

        b) The sprinkler system maximum demand.

The sprinklers should be installed iaw the design statement and by competent persons to BS 9251. If CPVC pipework is used as the distribution pipes the installers should be competent to install the pipework and the appropriate fire

stopping materials that can be used around the pipework to prevent contamination or mechanical damage to the distribution pipework.

Compartmentation

Within both ADB and BS 9991:2015, the provisions for the means of escape for apartments are based on the assumption that a fire will generally start in a flat, with a high degree of compartmentation and therefore, there will be a low probability of fire spread beyond the flat of origin, so that simultaneous evacuation of the building is unlikely to be necessary. Although fires may occur in the communal areas of the building, the materials and construction used should prevent the fabric from being involved beyond the immediate vicinity.

As the building is over 5m in height and under 18m the compartmentation should be 60 minutes. To achieve these objectives the following should be constructed as 60 minute fire resisting compartment walls and floors:

- Every floor.
- The walls separating the dwellings from the communal areas.
- Stair enclosures.
- Walls enclosing any ancillary accommodation.

Loadbearing Elements of Structure

Elements of structure subject to protection in order to achieve the designated building fire resistance periods of 60 minutes as the building is over 5m include:

- Beams.
- Columns.
- Floors (whether compartment floors or not).
- Loadbearing walls.

The periods of fire resistance should be:

- Compartment floors – 60 minutes.
- Compartment walls (walls between apartments and communal areas) – 60 minutes.
- The walls separating the stairs and the café/shop – 60 minutes.
- Any service riser shafts if provided - 60 minutes.
- Smoke shaft if provided– 60 minutes.
- Protected entrance hall – 30 minutes.

Any structural steel beams or columns provided within the building should be protected with at least 60 minutes fire protection and be installed iaw the National Structural Steelwork Specifications for Building Construction (6th edition published 2017). Where one element has reliance for stability on another element with a lesser

fire time requirement then the higher of the two periods must be applied to both elements.

Compartment walls including the protected entrance hallways should extend from the top of a floor slab to the underside of the slab above. Where the wall meets another compartment wall or a compartment floor, the junction detail will maintain the standard of separation equivalent to the wall and floor using appropriate fire stopping methods where necessary.

Protection of Openings

The drawings provided do not illustrate any cavity barriers or fire stopping for sealing penetrations. But the design team should consider:

- Cavity barriers and fire stopping should be provided around windows and doors iaw ADBV1:2020 Diagram 8.1.
- Any penetrations within compartment walls and floors including SVP are sealed iaw ADBV1:2020 Table 9.1. Pipe and cable penetrations which are required to be sealed due to the internal diameter or the where the penetration is not sealed adequately should be sealed with either an intumescent mastic or proprietary intumescent collar. Expanding fire resisting foam should only be used as per the manufacturer's requirements to infill small linear gaps and NOT as a general sealer/in-filler.

Wall and Ceiling Linings

The drawings provided do not illustrate the wall or ceiling linings, it is noted that the wall and ceiling linings should be iaw ADBV1:2020 Table 4.1.

Fire Doors

The fire doors should be tested for fire resistance and smoke control (where appropriate) iaw BS EN 1634 suite of standards. The following door locations will be designated as fire doors iaw BS 9991 (Table 12) and ADBV1:2020 Table C1.

- Apartment entrance doors - FD30s (SC).
- Door from Café adjacent to the communal stairs – FD60s (SC).
- Doors within protected entrance hallways– FD30.
- Stair lobby doors if provided – FD30s (SC).

The suffix "s" denotes that a smoke seal is required and (SC) indicates that a self-closer device is required. Doors which are kept locked shut when not in use do not require a self-closing device.

The drawings provided do not indicate if the apartment front doors are provided with letter plates or a post box on the ground floor. If letter plates are provided within the apartment front doors they should be fire resisting to BS 476 part 22: 1987 and BS 476 Part 31/1: 1983 and the letter slot should be in the position of the fire door certification fire test. If a post box is provided on the ground floor, the post box

should be fire resisting to prevent a fire in a post box from affecting the means of escape.

The fire doors should be installed iaw the manufactures specifications or BS 8214:2016, including the gaps around the frame and the door leaf, the threshold gap and the gap and the materials used between the door frame and the supporting wall normally covered with a architrave.

It is noted that the Preconstruction Team Meeting Minutes (No 4) dated 29.01.2021 discusses upgrading the existing fire doors. If this is undertaken the best classification the doors can be considered would be is a notional fire door and not certified fire doors. If the doors are to be notional fire doors, the doors should be assessed by a competent person and this should be recorded within the Regulation 38 information and the fire risk assessment. Any coatings used to upgrade fire doors must be iaw the manufactures recommendations and application instructions, it should be noted that not all doors can be upgraded to fire doors and discussions should be undertaken with the treatment manufacturer to confirm it is appropriate.

External Wall Construction and Surface Spread of Flame.

The current guidance for external walls to building under 18m should be constructed using a material that does not support fire spread and therefore endanger people in or around the building. Although the guidance for the external envelope for buildings over 18m has been updated following the Grenfell Tower tragedy, the current guidance has not changed in the 2020 ADB updates for buildings under 18m in height. Within ADB V1:2020 a building under 18m does not fall into the category of a relevant building (more than two dwellings and over 18m in height).

The drawings provided does not illustrate the external wall construction, therefore it is recommended that the standards within ADB V1:2020 Table 10.1 are considered by the design team.

The use of the 3rd floor as a roof or roof terrace has not been finalised, the drawings provided do not illustrate the roof layout and therefore it should be considered that if the 3rd floor is just a roof it is not required to provide fire resistance unless it is to be used as a means of escape, also if the roof pitch has an angle less than 70^{0c} it may be disregarded for separation distances purposes. If the 3rd floor is to be used as a roof terrace it should be considered a floor.

No site plan has been provided, therefore the design team should consider the notional boundary and unprotected areas permitted. It would be reasonable to apply Method 1 to calculate acceptable unprotected areas within ADB V1:2020.

Facilities for Firefighting.

As the 67 Morrab Road is not over 18m in height a firefighting shaft is not required. The only requirement is to provide access for a pumping appliance to within 45m of all points inside each flat of a block, measured along the route of the hose.

The hose-line travel distance is 37.8m from the front access lobby to the furthest point within the apartment on the 2nd floor. Therefore as the most likely parking location will be on the public highway outside 67 Morrab Road a dry riser is not required.

It is presumed that as the access road is the existing public highway it meets the requirements of ADB V1:2020 Table 13.1 and fire appliance not having to reverse more than 20m, but this should be confirmed by the design team.

Any security features for 67 Morrab Road are not illustrated on the drawings provided, if the access/egress door located on the ground floor are provided with a security feature it may cause problems for fire-fighters trying to access the building i.e. access into the stair core in an emergency. To avoid potential conflicts between access and the security arrangements for the building, it should be considered by the design team that a fire service `drop-key` control point should be provided for the fire service access point on the ground floor.

Fire Hydrant

The building does not have a compartment in excess of 280m^2, therefore additional hydrants are not required to comply with Building Regulations.

Items to be Considered

Emergency Lighting

The drawings do not illustrate any emergency lighting. It should be considered by the design team that emergency lighting within the communal areas of the premises should be provided iaw BS 5266 -1:2016. A 3-hour duration system should be provided in communal areas within the premises as these escape routes are from a sleeping risk premises.

As the commercial areas are to be a `shell build`, the emergency lighting for the commercial areas would be undertaken during the Building Regulations submission during its refit.

Fire Extinguishers

As there are no permanent staff or staff controlled areas fire extinguishers should not be provided.

As the commercial areas are to be a `shell build`, the occupier of the shop and café should consider the provision of fire extinguishers iaw BS 5306-8:2012 - Selection

and positioning of portable fire extinguishers and BS 5306-3:2017 – Commissioning and maintenance of portable fire extinguishers.

Fire Signage

The drawings provided do not illustrate any fire signage. The design team should considered the requirements for fire signage, as this is a single stair building exit signage would not normally be required but fire door signage should be provided as required.

It is noted that if the roof terrace is provided the height of the building would be over 11m and therefore fire service way finding signage would be required i.e. floor identification and apartment indictor signage. If the 3rd floor roof terrace is not provided the building would be considered under 11m and the fire service wayfinding signage would not be required.

As the commercial areas are to be a `shell build`, the fire signage required would be considered during the Building Regulations submission.

Regulation 38

Regulation 38 of the building regulations requires that: The person carrying out the work shall give fire safety information to the Responsible Person (RP) not later than the date of completion of the work, or the date of occupation, whichever is earlier.

Therefore, all the fire safety information including drawings and design statements should be passed on to the RP.

Small Shop

It is presumed that the small shop is also a `shell build`, it is noted that the drawing provided does not illustrate a 1st floor for the small shop but the photograph's provided indicate dormer windows on the 1st floor. When the small shop has its `fit-out` all areas of the shop should be considered during the Building Regulations submission.