Appendix J. M&E Stage 4 Pack

OATWAY design

consulting engineers

'The heart of the building'

Trewirgie Junior School, Redruth, Cornwall

New Classroom Block

Mechanical and Electrical Services Specification of Works

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Specification Prepared By: SO/LM
Checked By: S Oatway
Project Number: P1208

Schedule of Document Revisions

Rev	Description	Revision Date	Prepared/Revised By	Checked By
T0	Tender Issue	October 2019	S Oatway / L Morgan	S Oatway

Schedule of Contents:

Sub-Contents:

1.0 PROJECT DESCRIPTION, PREAMBLES AND GENERAL DESCRIPTION

1.1 PROJECT INFORMATION

This brief description of project information is issued for the guidance of the Mechanical and Electrical engineering services Sub Contract(s) Tenderers only. It is not intended to give full details of the contract preliminaries and conditions of contract etc.; these shall be established by the Tenderer from the Main/Principal Contractor Tendering for the project.

The successful Mechanical and Electrical Sub-Contractor(s) will be appointed by the Main Contractor on a domestic sub-contract basis.

Site: Trewirige Junior School, Redruth, Cornwall, TR15 2QN

Main/Principal Contractor: TBC

Supervising Office: Shall mean the appointed Clients Representative(s)

The Mechanical and Electrical Sub-Contractor(s) shall be deemed to have included for all materials and workmanship (including commissioning) to complete and set working the whole of the works in accordance with the requirements of the specification and drawings, and to the reasonable satisfaction of the Main/Principal Contractor.

The Mechanical and/or Electrical Contractor(s) shall visit site during the Tender period to ensure they are fully conversant with the site layout and its conditions, Failure to do so will not be considered the basis of a claim. This shall be by prior appointment only.

1.2 IMPORTANT TENDER INFORMATION

The following specification has been produced to enable the mechanical and electrical tenders to base their Tender offer on the exact same design, which has been agreed with Oatway Design Ltd and the Client.

The successful Contractor will take full responsibility for the system performance in accordance with the design criteria/design detailed within this specification and associated Tender drawings.

If for any reason (such as to comply with the above) the tenderer would like to add or omit any items, these must be costed and submitted on a separate schedule for consideration.

Full working drawings of the entire installation will need to be submitted to Oatway Design Ltd a minimum of 10 days before commencement of works on site.

Oatway Design Ltd reserve the right to employ an independent engineer(s) to check these plans against the agreed specification and under further checks to be carried out at first and second fix stage. Any extra work required by the Main Contractor (or others) to enable rectification work to be carried out will be borne by the mechanical and/or electrical Contractor(s).

The Mechanical and/or Electrical Contractor(s) shall liaise with the Main/Principal Contractor to prepare and issue for comment/approval a phased programme of works for the services installation as detailed, whilst preparing their Tender offer the Contractor is deemed to have included all programming of works in conjunction with the site requirements.

If the Mechanical/Electrical Contractor notes any discrepancies, omissions, or items regarded as at variance with good practice, then he shall refer to this before returning their quotation.

Any discrepancies within the specifications shall be brought to the attention of the Main Contractor. In the event of a discrepancy being discovered after the time of supplying a quotation, or being unresolved at when the quotation is submitted, the alternative having the greater cost shall be deemed to have been included in the quotation.

The Contractor is to check all dimensions on site, and advise the Contract Administrator of any discrepancies, particularly before ordering any components.

1.3 DEFECTS LIABILITY PERIOD AND MAINTENANCE

The Mechanical and/or Electrical Contractor(s) will be totally responsible for maintaining and servicing the installation during the whole of the Defects Liability Period of twelve months from date of handover or any other period detailed elsewhere within the Contract documents.

Such maintenance shall be in accordance with any relevant British Standards, and statutory requirements heating systems, ventilation units, Fire Alarm, Emergency lighting, etc. and as per manufacturer's recommendations for each item of plant.

A report shall be provided following each visit detailing any comments/action taken. A copy of the report shall be forwarded to the Main Contractor.

1.4 RECORD DRAWINGS AND OPERATING AND MAINTENANCE MANUALS

The Mechanical/Electrical Contractor shall provide 'RECORD DRAWINGS' showing the full extent and accurate details of the installed positions of engineering services.

The record drawings shall show positions, runs, sizes and types of equipment, ductwork, trunking, major cable runs, pipework etc.

Complete record drawings shall be provided as follows:

- 3x sets of drawings (paper format) printed in full scale.
- 1x set of the 'RECORD DRAWINGS' drawings in AutoCAD .dwg format on CD.

The Mechanical/Electrical Contractor shall hand over the record drawings to the Main Contractor at the completion of each Block. Failure to do so will prohibit the issue of a Practical Completion Certificate for the works.

Operating and Maintenance Manuals

The Mechanical and/or Electrical Contractor(s) shall provide operating and maintenance manuals for all the equipment provided.

The manuals shall contain manufacturers' literature, method of operation, fault finding charts, extent of maintenance and servicing required, list of spares, test certificates, commissioning reports, etc.

The format of the manuals shall be agreed before submitting for approval.

The manuals shall include the following:

- General and technical descriptions giving the function and manner of operation of each system.
- Instructions for starting up, operating and shutting down of each system, including any emergency/safety routines.

- Schedule of equipment supplied showing details of make, model type, serial number, and name plate data.
- List of manufacturers' names, addresses, telephone for all major items of equipment.
- Manufacturers' general catalogue and installation/maintenance instructions for all items of equipment.
- Schedule of recommended spares and lubricants for all equipment.
- Schedule of maintenance requirements on a daily/weekly/monthly/annual basis.
- Data on general setting of controls and monitoring instruments of each system.
- Fault finding schedules and routines.
- Information relating to Health and Safety.
- Copies of valve charts, schematics, wiring and control diagrams, copies of commissioning/test records and certificates.
- List of record drawings.

The complete manuals shall be provided as follows:

- 3x copies bound into A4 ring binders.

- 1x copy of the full manual (including any manufacturers literature) in digital format on CD

The Mechanical and/or Electrical Contractor(s) shall hand over the record drawings to the Main Contractor at the completion of each Block. Failure to do so will prohibit the issue of a Practical Completion Certificate for the works. A draft copy of the manuals is to be provided to the Main Contractor and Contract Administrator for approval before completion.

The Mechanical and/or Electrical Contractor(s) shall also provide a Building Log Book in accordance with Building Regulations Part L2 and CIBSE guidance this should be in addition to the operating and maintenance manuals.

Log books shall be provided for the domestic water quality check, the fire alarm and emergency lighting systems etc.

1.5 THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015

The Construction (Design & Management) Regulations and associated Code of Practice shall be incorporated in this Contract.

The Contractor shall allow for complete compliance with the Regulations within the Works.

In developing the Construction Phase Health and Safety Plan the Principal Contractor is to indicate to the Contract Administrator his compliance with the Regulations by providing Risk Assessments and Method Statements of relative matters prior to those matters being commenced onsite. The Principal Contractor is to provide the Contract Administrator with regular reports on the progress of his development of the Construction Phase Health and Safety Plan in a format to allow the latter to assess the formers compliance with the Regulations.

During tender the Contractor is to view the Asbestos registers and be satisfied as to the level of risk, and any subsequent requirements to provide safe working for employees.

1.6 SITE FACILITIES AND MANAGEMENT

The Mechanical and/or Electrical Contractor(s) shall provide all accommodation and facilities necessary for the proper protection and progress of their works. The site accommodation and facilities may require relocating during the progress of works on site, the Contractor(s) shall allow for this within their Tender offer.

The Mechanical and/or Electrical Contractor(s) shall appoint an on-site foreman who shall coordinate all works and supervise all works including those of any sub-contractors, the foreman shall liaise with the Main/Principal Contractor to ensure the programming of works meets with the Clients requirements. Specific attention should be made to modifications to any existing system.

The Contractor shall allow for attending monthly progress meetings (or as deemed necessary for the project) which will be held on site. The Contractor shall allow for providing a weekly written progress report to the Contract Administrator, clearly detailing the progress to date on an elemental basis together with an evaluation of the work and any requests for information required to complete the Contract.

Material shall be stored on site in a specific storage unit or area dedicated to the storage of plant/equipment. These materials shall be stored in a safe, dry place which shall be prior agreed by the Client and/or Main Contractor. Any cut ends of ventilation ductwork, pipework, cable tray/conduit etc. shall be treated accordingly to protect from corrosion. All open ends of pipework, ductwork etc. shall be capped/sealed to stop the ingress of dirt and/or debris.

The Contractor is to regularly clear away all rubbish and debris from site and common areas and keep those areas clean. Upon completion of the works, the Contractor shall employ a specialist cleaning company to fully clean the area of the Work and other areas affected by the work. This should include, but not be limited to, floor coverings, paintwork, glass, M&E fittings and fixed and loose FF&E.

1.7 COORDINATION OF SERVICES

The Mechanical and/or Electrical Contractor(s) shall liaise closely with all other trades to ensure that work progresses smoothly and that there is full coordination of all services.

The Contractor(s) shall be responsible for providing and submitting for comment/approval fully coordinated drawings detailing all services and structural restrictions.

In the event of work having to be taken down and re-done due to lack of foresight/communication between the Mechanical/Electrical Contractor and any other trades, then this will be at the Mechanical/Electrical Contractor(s) own expense, together with the cost.

1.8 WORKING AND CONTRACT DRAWINGS

This specification and associated project ‘TENDER’ drawings shall be read in conjunction with drawings provided by:

- Architectural Drawings
- Structural Engineers Drawings
- Sub-Contractors Drawings

Drawings shall only be used for their intended purpose; the Contractor shall not scale or install their services from any drawings other than the prior agree/approved ‘WORKING DRAWING’ produced and provided by themselves.

All 'WORKING' and or 'CONSTRUCTION' issue drawings shall be issued to the design team for comments/approval at least 10 days prior to any work commencing on site. These drawings shall be checked and status marked by the Contract Administrator and/or Oatway Design Ltd as follows:

A - Approved may be used for construction.
B - May be used for construction subject to the comments being incorporated. Drawing to be revisit and re-submitted for information only.
C - Do not use for construction. Revise, re-submit for further inspection.
D - Rejected. Not acceptable due to lack of professional information. Revise and re-submit for further inspection.

1.9 EXISTING SERVICES

The Mechanical and/or Electrical Contractor(s) will be responsible for careful programming and phasing of the mains connection work in order to minimise disruption.

Any operation that involves any interruption to existing services to the other operational units, must be carried out at times to be agreed and a minimum of 10 days prior notice is to be given to the Main Contractor. Such notice is to be given in writing in the form of a method statement detailing the works to be undertaken and the proposed timescale. Any such operation will normally be required to be carried out outside of normal working hours.

Any/all mechanical and/or electrical services which become redundant by the proposed works shall be removed in its entirety by the Contractor(s) unless otherwise stated. Any removed services shall be offered to the Client and/or Contract Administrator for re-use on the site prior to removal from site.

1.10 ASSOCIATED BUILDERSWORK

All builderswork associated with the mechanical and/or electrical services installation shall be carried out by the Main/Principal Contractor. The Mechanical and/or Electrical Contractor(s) shall liaise directly with the Main/Principal Contractor with details and fully dimensioned working drawings, of all necessary builderswork/making good associated with the new/adaptation of existing mechanical services installations. All holes and chases in walls, floors, ceilings etc., for the passage of mechanical and/or electrical services shall be made good with a neat and tidy including finishes/decoration and fire stopping.

The Mechanical and/or Electrical Contractor(s) shall allow for all necessary materials and labour to provide fire stopping around pipework, ductwork and cable tray etc. where fire barriers are penetrated. All fire stopping shall be completed using suitable materials which meet current regulations and the requirements of the project fire officer.

The Mechanical Contractor shall provide the Main Contractor with location, sizes etc. of access hatches within the building fabric to allow access for the maintenance of mechanical plant.

1.11 TESTING AND COMMISSIONING

All services shall be thoroughly pre-commissioned, mechanically and electrically, balanced and regulated then commissioned and set to work in accordance with all the relevant C.I.B.S.E. commissioning codes and equipment manufacturers' requirements. Full use shall be made of manufacturers' specialist commissioning engineers.

Any unscheduled or unorganised interruption to any existing services and/or system during the commissioning stage will not be accepted. Any cost incurred by the Client due to any isolation and/or disruption of services shall be appointed to the Contractor(s).

Full commissioning of and documentation for all services will be required including, but not limited to,

extract fans, air handling units, air flow rates, heating distribution system, comfort heating, hot water heater temperatures settings, blending valve temperatures settings, etc.

1.12 DEMONSTRATION OF SERVICES/SYSTEMS

The Mechanical and/or Electrical Contractor(s) shall include to demonstrate the full mechanical and/or electrical installation to the Client and/or Client Representative(s). The Contractor(s) shall ensure the Client has a full and comprehensive understanding of the systems prior to completion.

1.13 HOT WORK AUTHORISATION

A Hot Work Authorisation is required for all operations involving flames, hot air, arc welding, gas torch or disc cutting, brazing, soldering, blowlamps, bitumen boilers and any other equipment or task that produces heat or has naked flames and presents a risk of starting a fire. The mechanical services contractor is to work to a Permit procedure laid down by the Principal Contractor and approved by the Project Manager. Hot work is to be avoided if possible, to eliminate the fire risk and cold formed mechanical pipe jointing methods such as Mapress and Pressfit are preferred.

1.14 USER INSTRUCTION

The Mechanical Contractor shall provide adequate user instruction to the Client and/or his representatives to ensure they are fully familiar with the installations and can operate them under normal conditions and are aware of emergency procedures. This instruction shall be carried out at a time to be agreed before Handover and shall cover all equipment and systems.

1.15 EQUAL AND APPROVED

All items of plant, equipment and materials named in this specification by manufacturer and or/model type, are intended to impart the design criteria, construction and performance to be used for the building of the systems as specified and drawn where applicable. Any product numbers or references shall not be relied upon as definitive guidance for ordering and the contractor shall satisfy themselves that in any such cases, the materials and equipment ordered meet the performance criteria as required.

Where an alternative is being offered as an equal for approval, the Mechanical and/or Electrical Contractor(s) shall in all respects provide suitable and detailed data for the specified item and the offered alternative selection, detailing at minimum component part construction and materials used, the British Standards and Codes of Practice covering the manufacture, materials and grades, construction and tests where applicable, this shall also include motors and drives. The Mechanical and/or Electrical Contractor(s) are to provide tabulated proof of equal performance, rating and efficiency, all measured against the same base criteria. Manufacturers catalogue data sheets shall be provided highlighted where necessary to show equality.

Unless all of the above information is freely and efficiently provided, alternatives will not be considered. In short, the Mechanical/Electrical Contractor(s) shall prove equality. The Consulting Engineer shall only approve the offered alternative thereafter.

Only after approval from the Consulting Engineer can the Mechanical/Electrical Contractor install the offered alternative.

1.16 BUILDING LOG BOOK AND USER GUIDE

The Mechanical and/or Electrical Contractor(s) shall provide a Building Log Book in accordance with Building Regulations Part L2.

The Building Log Book shall be to CIBSE guidance and be in addition to the operating and maintenance manuals. In addition, a simplified Building User Guide shall be provided. This user guide shall be written in non-technical layman's terms, and shall be a maximum of 2 pages, noting the key systems and the basic points that any user could reasonably be expected to know in order to use the buildings safely and efficiently.

Vital items to be included are but not limited to: -

- Locations of main points of isolation and how to operate them
- Basic operation of heating, lighting and water systems
- Setting and resetting of alarm and control systems
- Emergency contact numbers in event of failures

The above list is a guide only and is not exhaustive.

2.0 MECHANICAL SERVICES SPECIFICATION

2.1 MECHANICAL SERVICES DESCRIPTION

The Mechanical services Contractor shall be a domestic sub-contractor to the Main/Principal Contractor.

Scope of Works

- **Heating System Installation**
  The mechanical Contractor shall provide, install, test and commission the new ASHP (Air Source Heat Pump) heating system along with the underfloor heating system which includes manifolds, pumps, underfloor heating pipework, zone controls and wall controller's, distribution pipework/valves etc. in accordance with this specification of works and associated project drawings.

- **Above Ground Drainage**
  The Mechanical Contractor shall provide, install, test and commission the new above ground drainage systems in accordance with this specification of works and associated project drawings.

- **Ventilation Services**
  The Mechanical Contractor shall provide, install, test and commission the classroom heat recovery ventilation and centralised toilet extract ventilation systems as detailed and in accordance with this specification of works and associated project drawings.

- **Domestic Services (Hot and Cold Water) Installation**
  The Mechanical Contractor shall provide, install, test and commission all the local electric hot water generation units, associated plant and new hot and cold-water distribution pipework/valves in accordance with this specification of works and associated project drawings.

- **Automatic Controls Installation**
  The Mechanical Contractor shall provide, install, test and commission the mechanical system(s) controls system as detailed and in accordance with this specification of works and associated project drawings.

- **Testing and Commissioning**
  The Mechanical Contractor shall include to fully commission the new mechanical services installation in accordance with the manufacturer's recommendations. Any specialist systems shall be commissioned by the specialist installer/sub-contractor.

Description of Works

2.1.1 Above Ground Drainage

The Mechanical Contractor shall provide, install and test all the above ground drainage system in accordance with this specification of works and as detailed on the project drawings. Drainage connections shall be taken from each item of sanitary ware, overflow, waste, ventilation heat recovery unit etc. and shall be connected to the below ground drainage system.

The building shall be provided with a new soil and waste above ground drainage system, complete with new stacks, traps, connections, to meet Building Regulations, the statutory and local authority regulations and in particular, BS EN 12056-2000 for sanitary pipework and rainwater pipework.

All systems shall be provided with adequate access caps/rodding eyes, permitting complete rodding to be achieved with minimum disturbance to the occupants (the Contractor shall liaise with the Architect/Main

Contractor to ensure all boxing/enclosing of the systems contain adequate access to the access caps/rodding eyes).

The Contractor shall also provide safety valve, condensate, etc. discharge systems serving the hot water heaters etc.

Soil/Waste/Ventilation Stacks:	Pipework, fittings and accessories to be PVC-u to BS4514, 110mm nominal diameter and suitable to be solvent welded.	
Waste Pipes:	Pipework, fittings and accessories to be MuPVC to BS5255 and suitable to be solvent welded.	
	Individual waste from sinks	38mm
	Individual waste from basins:	32mm
Traps:	P/S traps to be installed with seals as required by the Building Bulletins/Building Regulations.	

The Contractor shall include for all pipes, fittings, supports, fire collars, traps, adapters, connectors, etc. for the above ground drainage systems, including fittings for expansion, system movement. Additionally, they shall liaise with the Building Control Officer, and obtain approval for the installation and testing of the systems, ensuring the systems are cleaned and tested.

2.1.2 Domestic Services (Hot and Cold Water) Installation

Upon appointment the Mechanical Contractor shall obtain the flow rate and pressure of the existing main cold-water supply which is believed to enter the site via W Trewirgie Road and currently serves both the existing Junior school and nursery. This information shall be passed to the Contract Administrator (CA).

The mains cold-water supply to serve the proposed new classroom block has been calculated and detailed on the Tender Issue drawings. The Mechanical Contractor shall extend, provide, install, test, chlorinate and commissioning the mains cold water service from the position indicated on the project drawings to serve each outlet throughout the building as detailed. The pipework shall generally distribute throughout the ceiling void dropping locally to serve each outlet complete with a ¼ turn 'ball-o-fox' type isolation valve.

The Mechanical Contractor shall provide, install, test and commission the localised electric water heaters as detailed within the plant schedules section of this specification. Each unit shall be installed with the suitable expansion vessel to ensure correct operation. The Mechanical Contractor shall install ¼ turn 'ball-o-fox' type isolation valves on each outlet.

Internal hot water pipework shall be light gauge copper tube to BS EN 1057:1996 (originally BS 2871, Part 1, Table X), with BS 864 copper alloy capillary ring type fittings. All solder to be lead free.

Pipework shall be routed to allow minimum low-level runs; any pipework runs at low level shall be boxed in to ensure no scalding from any exposed pipework. All concealed pipework shall be thermally insulated in accordance with this specification.

The Mechanical Contractor shall ensure the hot and cold-water systems are supplied and installed with all necessary accessories to ensure a fully complete and operational system is provided. The system shall be installed in accordance with the manufactures instructions and recommendations.

2.1.3 Ventilation Systems

The Mechanical services Contractor shall provide, install, test and commission the ventilation systems as detailed within the plant schedules section of this specification of works and as shown on the associated project drawings.

These ventilation units/systems consist of mechanical ventilation heat recovery (MVHR) units and centralised toilet extract system. These ventilation units are to be controlled as detailed within this specification of works.

The Mechanical Contractor shall ensure the ventilation and heat recovery systems are supplied and installed with all accessories to ensure a fully complete and operational system is provided. The system shall be installed in accordance with the manufactures instructions and recommendations.

The construction and internal cleanliness of all ductwork systems prior to commissioning shall be in accordance with the Specifications for Sheet Metal Ductwork DW/144 and Guide to Good Practice Internal Cleanliness of New Ductwork Installations DW/TM2 (Advanced), published by the Heating and Ventilating Contractors Association unless amended by this Specification.

Flexible ductwork connections to final connections to terminal points are warranted for this project, these must comply with DW/144. These flexible connections must be installed without any obstructions to the ductwork or the natural flow of air passing through the length of ductwork, all connection must be made using suitable fixings to create an air tight seal. No lengths of flexible ductwork shall exceed 500mm.

Classroom Ventilation Control

The classroom MVHR ventilation system shall be controlled via a wall mounted Medem Inair 'traffic light' type monitoring indication panel. This shall control the ventilation system to meet the criteria as detailed within the Building Bulletin BB101 guidelines.

The Mechanical Contractor shall install carbon dioxide detector(s) within each space which shall detect the levels of carbon dioxide within the classrooms.

The high-level alarm shall detect 1,500ppm for 20 minutes and monitor a daily average less than 1,000ppm, these shall be monitored and indicated via the 'traffic light' LED's.

Toilet Area Ventilation Control

The toilet area centralised ventilation extract fan is a trickle/boost type, which shall remain in 'trickle' mode and shall enter the 'boost' mode on activation of duel output room PIR detectors and shall remain in 'boost' mode for a 10/15-minute interval. These PIR detectors shall be installed within each room/area.

The 'make up' air for the toilet area shall be provided via undercut doors to each room/area with an extract grille on the centralised ventilation system. These doors shall be undercut by the Main Contractor.

2.1.4 Automatic Controls Installation

The Mechanical Contractor shall provide, install, test and commission all automatic controls systems to ensure the correct operation of all items of plant schedules and/or detailed within this specification of works and the project drawings.

These automatic controls shall be supplied by the corresponding manufacturer of the plant to which the controls operate. These shall be installed in complete accordance with the manufacturer recommendations and installation guides. Where flow and/or air rates are given in this specification of works or detailed on the corresponding project drawings, the automatic controls shall be 'set up' to achieve these duties.

2.1.5 Heating System Installation

The Mechanical Contractor shall appoint a specialist underfloor heating Sub-Contractor, this specialist shall complete the design, installation, testing and commissioning of the new ASHP and underfloor heating system. The ASHP/Underfloor heating systems shall only be commissioned by either the Manufacturer or accredited and certificated engineers.

It is the responsibility of the Mechanical Contractor to ensure the agreed Sub-Contractor provides a suitable and fully operational system, which shall be served via the ASHP system. This shall include but shall not be limited to the underfloor heating manifolds, underfloor pipework, associated below floor and wall mounted controls and thermostats.

The Mechanical Contractor shall ensure the underfloor heating specialist designer designs the system in accordance with the latest Building Regulations, CIBSE guidance, good design working practice. With consideration taken to the Clients choice of floor coverings which **MUST** be accounted for during the specialist design process.

All the underfloor heating wall mounted thermostats shall generally be installed in the locations indicated on the project drawings. However, these locations shall be further confirmed by the Client/Clients Agent during the project. Reference shall be made to this specification for details of the proposed controls system.

The Mechanical Contractor shall ensure the LTHW heating system is supplied and installed with all necessary accessories to ensure a fully complete and operational system is provided. The system shall be fully installed in accordance with the manufactures instructions and recommendations.

The Mechanical Contractor shall purchase and supply the electrical panel heater which are detailed/scheduled within this specification of works. These electric panel heaters shall only be installed by the project Electrical Contractor.

2.1.6 Testing and Commissioning

The Mechanical Contractor shall ensure all the items of the/their mechanical services installation in tested and commissioned in accordance with all current Building Regulations, British Standards, CIBSE standards, all associated good working practices and the manufacturers installation/testing/commissioning recommendations.

As detailed within this specification of works, all the test and commissioning certification shall be forwarded to the Contract Administrator for comments/approval. Once accepted, these shall form part of the Mechanical Services Contractor project operating and maintenance manual.

2.2 REGULATIONS AND STANDARDS

The complete Mechanical services installation shall comply with the following but not limited to the regulations, standards and statutory regulations current at time of the order for the works is placed:

- Building Regulations
- Building Bulletin guidelines
- Health and Safety at Work Act
- CDM Regulations 2015
- Gas Safe Regulations
- F Gas and Ozone Regulations
- COSHH Regulations
- British Standards
- European harmonised standards (BS EN)
- Pressure Systems Standards and Regulations
- Chartered Institution of Building Services (CIBSE) standards, commissioning standards, Building Energy Codes
- IET Wiring Regulations (BS7671) – Latest edition
- Heating and Ventilation Contractors Association Specifications including TR20, RAC70, RAC80, DW144, DW154, DW172
- Energy Related Products (ErP) Regulations 2010 SI 2010

Any conflict between the requirements as detailed within this specification and/or the associated project drawings and any of the above regulations/standards shall be brought to the attention of Oatway Design Ltd immediately.

2.3 SCHEDULE OF TENDER DRAWINGS

This specification should be read in conjunction with the project drawings as scheduled on the document issue sheet.

Any dimensions given on the drawings shall take preference to those which may be scaled from the drawing. The Contractor is reminded that the drawings should not be scaled from.

Should any discrepancies between the drawings and this specification be detected by the Tenderer, these should be forwarded to the Design Engineer, Contract Administrator at least four days before the date of the Tender return. Any claim for additional costs resulting from inadequate assessment will not be considered.

The Contractor is deemed to have included all plant/equipment, bends, pipework joints, valves including routes around soil vent, rainwater and structural columns to complete the full works to ensure a fully compliant operational system is installed, tested, commissioned and left in full working order.

The Contractor(s) shall prepare and submit for comment/approval 'WORKING DRAWINGS' indicating all pipework/ductwork routes.
These working drawings shall be completed to include all fully coordinated services layouts to a scale no more than 1:50. The Contractor(s) shall also supply all schematic layouts of systems, and shall include the following:

- Any 'pinch point' coordination details shall be presented in a scale no more than 1:20
- Copies of Manufacturers drawings of all plant/equipment to be supplied by the Contractor(s)
- All builders' works requirements e.g. floor ducts, trenches, holes through walls/roofs etc. At a scale no more than 1:20
- All coordinated ceiling plan/grid layout drawings, at a scale no more than 1:50
- Any details of any purpose-built brackets, supports, hanger, anchors required at a scale of no more than 1:20

2.4 VALVE AND PIPEWORK GENERAL SPECIFICATION

PIPE & FITTINGS

a) Heating –
Copper pipe to BS-EN1057 (BS2871: Part 1: Table Z).

b) H&C Water System –
Copper pipe to BS-EN1057 (BS2871: Part 1: Table X) with capillary fittings to BS864: Part

SERVICE	PIPEWORK, FITTINGS AND/OR MATERIALS
Heating Flow & Return Pipework	Table 'X' copper tube with capillary fittings.
Domestic Hot and Cold Pipework	Table 'X' copper tube with capillary fittings.
Pipework Insulation and covering where exposed in classrooms, offices, corridors etc. i.e. not boxed in.	Standard A as 2.08.03 with Isogenopak 350 SE finish.

Valves for Hot and Cold-Water Services

PURPOSE	REF	SIZE MM	OVENTROP FIG. NUMBER	CRANE FIG. NUMBER	ALBION FIG. NUMBER
Isolating (Lever operated) (Lockshield gate) L	W L	15-50 65-125 15-75	107 90 104 82 104 31	D171A F624 D237	50 135 640LS
Regulating R	R R	 15-50 65-125 15-50	106 11 64 (low flow) 106 01 106 26 107 50	D923 D921 DM920 D138	26ULF 26 250 384
Non-Return Valves Drain cocks (plant rooms & concealed areas) (Exposed to view in rooms)	NRV DC DC	50-300 15-25 15	107 30 107 30 103 33 103 35	FM492 FM450 D171HULS D340	170 121

(i) Non-return valves to be figure 107 50 as manufactured by Oventrop or Crane D140 and installed in accordance with the manufacturer's recommendations.

(ii) Servicing valves to cistern ball valve assemblies to be Oventrop 107 93 or Yorkshire Fig No. 480, 481 or 486 to suit the application, or alternatively manufactured by Ballofix.

(iii) Double check valve assemblies, where called for under the Water Regulations, shall be supplied and manufactured by Oventrop Fig 440 00 from sizes 15mm to 28mm or Fig no 440 01 BSP DN15-DN50 or Watts Ocean, type TK Model or similar and approved.

2.5 THERMAL INSULATION

All insulation shall be CFC and HCFC free, non-fibrous, with zero Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) less than 5.

Insulation shall be manufactured to BS EN ISO 9001:2008, BS OHSAS 18001:2007 and BS EN ISO 14001:2004 with a factory applied vapour barrier. Phenolic Pipe Insulation shall include passivated, impregnated, liner technology with a passivating foam additive, creating a fully bore coated product.

All thermal insulation work shall be carried out by a member of the Thermal Insulation Contractors Association (TICA). Insulation shall not be applied until pipes, plant, equipment and ductwork have been tested.

Under the terms of the Montreal Protocol as enforced under EC Regulations 1005/2009, neither chlorofluorocarbons (CFCs) nor hydrochlorofluorocarbons (HCFCs) are permitted in the production of thermal insulation in the EU.

All Phenolic pipe insulation shall be CE Marked in accordance BS EN 14314:2009+A1:2013 as required by the Construction Products Regulation (EU) No 305/2011 (CPR). Phenolic pipe insulation shall have a European fire classification of BL-s1, d0 to BS EN 13501- 1:2007+A1:2009 and achieve BS 476-6 and BS 476-7 results to enable a Class O classification to the Building Regulation in England & Wales, and a Low Risk classification to the Building Standards in Scotland.

Pipe Insulation shall be FM Approved to Approval Class 4924 and achieve ASTM E84 Class 1/A and UL 723 25/50.

Pipe Insulation shall have a BREEAM Green Guide rating of A+ as shown on the BRE Green Book.

Pipe Insulation shall have a declared thermal conductivity of 0.025 W/mK at 10oC mean temperature in accordance with BS EN 14314 and based on the time averaged value over 25 years, plus a safety increment. The insulation system shall comprise Insulation, FireSleeves and Insulated Pipe Support Inserts and be in accordance with BS 5422 and BS 5970. Before applying insulation, all pipework should be clean and dry and free of corrosive substances such as excess soldering flux, building materials debris and moisture. On cold pipework the vapour barrier jacket should be fully sealed at longitudinal and circumferential joints with self-adhesive aluminum foil tape. All insulation terminations shall be sealed to provide a permanent and continuous vapour barrier over the insulation.

Pipework supports shall be insulated from the pipework on all HVAC services. On cold and chilled applications Insulated Pipe Support Inserts shall be used to minimise the risk of thermal bridging, limit the formation of condensation and facilitate the installation of a continuous vapour barrier. On hot water and LTHW services Insulated Pipe Support Inserts shall be used to limit overall system heat loss, and to minimise the risk of heat transfer through supporting structures.

FireSleeves shall be used as in accordance within the manufacturer's instructions where the insulation system passes through 2-hour fire rated walls.

For external applications, Pipe Insulation shall have an additional weather proof barrier. Approved protection includes the following: -

Polyisobutylene sheeting bonded to the insulation with minimum 30mm wide circumferential and longitudinal lap joints, which shall be fully solvent welded in accordance with the manufacturer's instruction.

Multi-layered polyester/aluminium foil/polymer: Sebald Iso-Systeme, Isogenotec, Silvercladd or approved equivalent. Composite to be installed strictly in accordance with manufacturer's instructions. Factory pre-curled rolls should be used for all round parts such as pipes and tanks, whilst flat sheet must be used for rectangular ductwork.

VentureClad or approved equivalent installed in accordance with manufacturers instruction.

The pipe insulation system shall have third party verification of the performance claims such as LABC Registered Detail status and LABC Warranty

Insulation in plantrooms to be covered and finished in rigid aluminium 'hammerclad' sheet cladding utilising propriety fitting for bends, flanges and valves etc. All Condensate, chilled water pipework and supply air ductwork shall be insulated and vapour sealed.

All external ductwork and pipework shall be insulated using PIB sheeting which shall be finished in material to restrict the possibility of vermin attack.

Pipework (Phenolic Foam) Thermal Insulation Thickness						
Pipe Size (mm)	**Condense (100°C Max)**	**LTHW (75°C Max)**	**DHWS (65/75°C Max)**	**CWS (10°C Max)**	**Chilled Water (5°C Max)**	**Cold Feed & Vent Pipe (10°C Max)**
15	-	15	15	15	20	15
20 / 22	-	20	15	15	20	15
25 / 28	-	20	20	15	20	15
32 / 35	-	20	20	15	20	15
40 / 42	-	20	20	15	25	15
50 / 54	-	25	25	20	25	20
65 / 67	-	25	25	20	25	20
80 / 86	-	25	25	20	25	20
100 / 108	-	25	25	20	30	20
125 / 133	-	30	30	20	30	20
150 / 159	-	30	30	25	30	25
200	-	30	30	25	35	25
250	-	30	30	25	35	25
300	-	35	35	25	35	25

Warm Air Ductwork Insulation Thickness		
ΔT°C (Inside Ductwork to Outside Air)	**Phenolic Foam Thickness (mm)**	**Mineral Wool Thickness (mm)**
10°C	20	30
25°C	30	40
50°C	35	50

Chilled Air Ductwork Insulation Thickness		
ΔT°C (Inside Ductwork to Outside Air)	**Phenolic Foam Thickness (mm)**	**Mineral Wool Thickness (mm)**
10°C	30	40
5°C	40	60
0°C	50	75

Frost Protection Insulation Thickness				
Outside (Nom) Diameter of Pipework (mm)	**Elastomeric Foam**		**Phenolic Foam**	
	Internally	Externally	Internally	Externally
Up to 15	32	38	20	25
22 to 42	32	38	20	25
54 to 76	32	32	20	20
Above 76	22	25	20	20

SERVICE	LOCATION	INSULATION MATERIAL	VAPOUR BARRIER	FINISH
HWS	Concealed	H&V Preformed Mineral Fibre Sections	No	Aluminium Foil With Non-corrodible banding at 450 cts
	Exposed to view at high level	H&V Preformed Mineral Fibre Section Foil Faced	No	Isogenopak cladding
	Exposed to view at low level – non plantroom	None	No	Painted or chromium finish
LTHW	Concealed	H&V Preformed Mineral Fibre Sections	No	Aluminium Foil
	Exposed to view at high level	H&V Preformed Mineral Fibre Sections	No	Isogenopak Cladding
	Plantroom	H&V Preformed Mineral Fibre Sections	No	Stucco Aluminium clad with purpose made valve boxes
	Exposed to view at low level – non plantroom	Phenolic Foam	No	
MCWS/BCWS	Concealed	H&V Preformed Mineral Fibre Sections	Yes	Aluminium Foil
	Exposed to view at high level	H&V Preformed Mineral Fibre Sections	Yes	Isogenopak Cladding
	Plantroom	H&V Preformed Mineral Fibre Sections	Yes	Stucco Aluminium Clad
	Exposed to view high level	None	No	Painted or Chromium
	External	H&V Preformed Mineral Fibre Sections	Yes	PIB Cladding – Heavy Duty External Grade

2.6 PLANT SCHEDULES

2.6.1 Ventilation Fans

Ref:	**MVHR01**
Quantity:	2
Location:	Classrooms
Manufacturer:	System Air (Contact Alex Bolt Tel: 07886 553661)
Type:	VSC700EL
Duty:	160l/s @ 125pa
HR Efficiency:	88.9% Eurovent Certified
SFP:	1.72
Electrical:	240v/1ph/50hz
Dimensions:	1330lx 1080w x 310d
Weight:	95kg
Ancillaries:	Complete with attenuators, onboard electric heater battery, controls/controller/associated wiring and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**EF01**
Quantity:	1
Location:	Plantroom
Manufacturer:	Vectaire (Contact Alex Bolt Tel: 07886 553661)
Type:	MBOX125/2DC-B
Duty:	80l/s @ 75pa
SFP:	0.27
Electrical:	230v/1/50hz
Control:	Trickle/Boost on activation of PIR detector located in corridor c/w 10-15min run-on
Ancillaries:	Controls and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**EF02**
Quantity:	1
Location:	Cleaners Cupboard
Manufacturer:	Vectaire (Contact Alex Bolt Tel: 07886 553661)
Type:	EL1003DT
Duty:	15l/s @ 20pa
SFP:	0.16
Electrical:	230v/1/50hz
Control:	ON/OFF via wall switch c/w 10-15min run-on
Ancillaries:	Controls and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

2.6.2 Grilles/Diffusers/Louvres

Ref:	**SG01**
Quantity:	4
Location:	Classrooms
Manufacturer:	Grada (Contact Alex Bolt: 07886 553661)
Type:	WT100
Duty:	80l/s @ 8pa
Noise Rating:	<20NR
Size:	250mm
Ancillaries:	Plenum box and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**EG01**
Quantity:	4
Location:	Toilet Areas
Manufacturer:	Grada (Contact Alex Bolt: 07886 553661)
Type:	VA061
Duty:	20l/s @ 11pa
Noise Rating:	<20NR
Size:	125mm
Ancillaries:	Plenum box and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**EG02**
Quantity:	4
Location:	Classrooms
Manufacturer:	Grada (Contact Alex Bolt: 07886 553661)
Type:	WT100
Duty:	80l/s @ 8pa
Noise Rating:	<20NR
Size:	250mm
Ancillaries:	Plenum box and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**L1**
Quantity:	2
Location:	Classrooms
Manufacturer:	Systemair (Contact Alex Bolt: 07886 553661)
Type:	CVVX250 Combi Grille
Duty:	160l/s @ 12pa
Noise Rating:	<20NR
Size:	680L x 550H x 136D (mm) 250dia Each Spigot
Ancillaries:	Bird Mesh and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

2.6.3 Hot Water Heaters

Ref:	**WH01**
Quantity:	2
Location:	Classroom Store Cupboards
Manufacturer:	Heatrae Sadia
Type:	Multipoint 10
Capacity:	10ltrs / 3.0kW
Electrical:	230v/1/50hz
Dimensions:	252D x 267W x 572H (mm)
Ancillaries:	All necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**WH02**
Quantity:	1
Location:	Ground Floor Wash Facilities
Manufacturer:	Heatrae Sadia
Type:	Multipoint 15
Capacity:	15ltrs / 4.5kW
Electrical:	230v/1/50hz
Dimensions:	252D x 267W x 728H (mm)
Ancillaries:	All necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

2.6.4 Underfloor Heating

Notes: All outputs detailed below (w) are thermal outputs

Ref:	**Heat Pump**
Manufacturer:	Daikin UK
Location:	Plantroom/External Condenser
Output:	11kW
Internal Unit:	EBH11CB3V – 11kW indoor unit with 3kW BUH (Heating Only)
Ext. Condenser:	ERLQ011CV3 – 11kW outdoor unit
Note:	Complete with EKRUCBL2 user interface controls/associated wiring and all necessary fixings and fixtures to ensure suitable installation in accordance with the manufacturer's instructions and recommendations.

Ref:	**UFHM01**
Location:	First Floor Void
Output:	9500w (To Be Confirmed by Underfloor Heating Designer/Contractor)
Control:	Floor sensor and programmer/controller
Note:	Refer to Specialist underfloor heating designer/installers information for design criteria, output, installation method/layout and control.

Ref:	**UFH-Z1 (Zone 1)**
Location:	Classbase 03
Output:	3700w
Floor Finish:	TBC

Ref:	**UFH-Z2 (Zone 2)**
Location:	Lobby
Output:	1300w
Floor Finish:	TBC

Ref:	**UFH-Z3 (Zone 3)**
Location:	Classbase 08
Output:	3700w
Floor Finish:	TBC

Ref:	**UFH-Z4 (Zone 4)**
Location:	Toilet Areas
Output:	800w
Floor Finish:	TBC

NOTE: ***The Underfloor heating system shall be designed, installed, tested and commissioned by a certified and qualified manufacturers approved installer. Reference should be made to their design information for final design and requirements.***

2.7 ABOVE GROUND DRAINAGE

The Mechanical Contractor shall supply and install a 100mm glass trap complete with topping up point and 19mm Terrain PVC-u overflow pipes and associated fittings for all ventilation air handling units and condensers. The condensate drain shall be installed in such a way that a continuous fall to the discharge position is maintained.

The Mechanical Contractor shall supply and install 19mm Terrain PVC-u overflow pipes and associated fittings, from all condensate pumps on each cassette units terminating 150mm above the nearest gulley. Excluding the initial rise from the condensate pump, the condensate drain shall be installed in such a way that a continuous fall to the discharge position is maintained.

The Mechanical Contractor shall supply, install and test all above ground drainage to meet the requirements of the contract. All above ground drainage shall be inspected by the Contract Administrator prior to 'boxing in'.

2.8 WATER TREATMENT

The Mechanical Contractor shall ensure all water is treated in accordance with the manufacture's recommendations by a recognised water treatment specialist.

Once all works are complete and prior to filling the system, all pipework shall be chemically cleaned and 'flushed through' in accordance with BSRIA Guides.

Corrosion inhibitors shall be added to the LTHW heating system, in accordance with guidelines and the manufactures recommendations.

The Mechanical Contractor shall carry out all testing and disinfection of the new and existing domestic hot and cold-water services to comply with the HSE ACoP guidance, legislation and British Standards. These test results and certification shall be forwarded to the Contract Administrator at least 3 days prior to the building being occupied.

2.9 ENERGY RELATED PRODUCTS (ErP) REGULATIONS

The Mechanical Contractor shall ensure compliance with the ErP regulations. These state that the installer shall be responsible for calculating and issuing efficiently labels for the entire heating system. This shall be carried out for 'new' systems and existing systems that a new boiler (heat source), hot water calorifier/cylinder, controls etc. The appliance label shall specify the energy efficiency category of the whole system.

The system energy efficiency label shall be displayed clearly and protected from water deterioration and/or damage. A second copy of this certification/label shall be inserted within the final project Operating and Maintenance manual.

2.10 VENTILATION (GENERAL)

The ventilation systems as detailed shall be installed in accordance with British Standards and the Heating and Ventilation Contractors Association (HVCA). Any ventilation system shall only be installed by a current member of the HVCA whom specialises in this particular trade.

All ductwork shall be zinc coated steel constructed from hot dip galvanised steel to BS EN 10142 Grade DX51D+Z coating type Z275, rectangular plastic ductwork to meet the requirements of HVCA DW154 or LFPE semi rigid ducting.

The ventilation system and internal cleanliness of all ductwork shall be commissioned in accordance with HVCA DW144 and the Guide to Good Practice Internal Cleanliness of New Ductwork Installations DW/TM2 (advanced). During transit and prior to full installation any unconnected (open ends) shall be suitable 'plugged' to prevent the ingress of any dirt and/or debris, any un-installed ductwork shall also be stored within a dry location/container. After installation, any area of damaged ductwork coating including joints shall be made good in accordance with the manufacturer's recommendations to maintain its protective finish.

Any penetrations though walls etc. shall be made with sufficient clearance around the whole circumference of the ductwork to prevent air movement transition of noise through the building structure. Access doors shall be installed in the ventilation system no more than 6m apart or 3m apart for ductwork below 500mm x 500mm and/or every change of direction, each access door shall be fully accessible to allow suitable cleaning and maintenance of the system.

The ventilation system shall be pressure tested for air tightness prior to being encased in any building structure, insulation of false ceilings etc. to meet the requirements of the HVCA 'A Good Practical Guide to Ductwork Leakage Testing' DW143 to the pressure given in table 32. Air leakage limits shall be as detailed within table 1 of DW144.

During the commissioning stage, holes may be cut in to the ductwork to carry out traversing air movement measurements, these shall be limited to 25mm and shall be suitable plugged after testing to ensure the integrity of the air movement throughout the system.

The ventilation system in full shall be suitable supported using the correct methods and fixings etc. to withstand the weight of the ventilation system as a whole. At no point, should any ventilation ductwork rely on the building fabric for support.

Flexible connections to final terminations are expectable and shall be carried out using foil faced flexible ductwork or pre-insulated versions for any supply or return heated/treated air. These lengths of flexible ductwork shall not exceed 1000mm and shall not rely on the building fabric/structure for support.

Volume Control Dampers
All volume control dampers (VCD's) shall be installed and manufactured in accordance with DW144, with single bladed double skin pattern VCD's being installed in ductwork 300mm x 300mm or 315mm diameter or less and opposed blade multi blade pattern for VCD's above.

All VCD's shall fitted with a locking device, position indicator and rubber sealing ring. These locking devices shall be suitable locked and marked upon completion of commissioning. Single bladed damper shall consist of two plates with multi bladed dampers shall be multi leaf aerofoil blade type.

Fire Dampers
All fire dampers and associated frames shall be manufactured and installed to comply with BS EN 12101-6. These dampers shall be a minimum size of 300mm x 300mm and shall maintain their fire resistance when exposed to conditions as specified in BS ISO 10294-1-2-3 classification E for a minimum of 2 hours.

The dampers shall be the 'curtain' type and shall be 100% clear of the air flow in the 'open' position, these dampers shall be held open via a self-latching removable realise mechanism cassette operating at temperatures of 72°C to 4°C (approximately).

Ductwork access doors shall be installed (as detailed above) either side of each fire damper to allow for maintenance etc. All fire dampers shall be witnessed for correct operation prior to hand over.

2.11 AIR GRILLES, DIFFUSERS AND LOUVRES

All grilles/diffusers shall be constructed from extruded aluminium and shall be coloured to the RAL colour as detailed within the plant schedule section of this specification. Each grille diffuser shall be manufactured with welded joints with mitred edges. All grilles shall be installed using the manufacturers recommended fixings and fixtures, any facia fixings shall be coloured to match that of the grille diffuser facia.

All grilles diffusers shall be complete with a suitable plenum box painted black internally (unless otherwise stated), with the correct entry spigot location and type. Each grille diffuser shall be complete with an opposed blade damper (OBD). Air terminal ratings shall be as determined by methods of testing and ratings given in BS EN ISO 5135.

All external louvres shall be constructed from either high-grade UV protected plastic for louvres 150mm x 150mm or below and extruded aluminium for louvres above. All external louvre shall be coloured to the RAL colour as detailed within the plant schedules section of this specification. These louvres shall be installed complete bird mesh.

2.12 VENTILATION FANS/HEAT REOVERY UNITS

The Mechanical Contractor shall install the ventilation fans and heat recovery unit in accordance with the manufacturer's recommendations, HVCA guidelines and as specified within the plant schedules section of this specification of works.

All local extract wall/window/ceiling fans extracting air from a single area shall be constructed from a plastic material and shall be installed with trickle/boost speed control, suitable finishing gasket, fixings frames/flanges, wall sleeves complete with back draught damper. All local fans shall be cleaned following completion of works but prior to hand over.

All ventilation heat recovery units shall be the packaged type and of double skin construction, with a minimum air gap between the inner and outer skins. The unit shall be pre-wired by the manufacturer with 'plug in' fans and associated controls for complete independent operation in compliance with this works specification.

The ventilation heat recovery unit's pressure classification and leakage testing shall be in accordance with the requirements of DW144, DW154 and DW143.

A minimum of two (2) replacement filters shall be passed to the Clients Agent prior to hand over.

Control:

Classroom Ventilation Control
The classroom MVHR ventilation system shall be controlled via a wall mounted Medem Inair 'traffic light' type monitoring indication panel. This shall control the ventilation system to meet the criteria as detailed within the Building Bulletin BB101 guidelines.

The Mechanical Contractor shall install carbon dioxide detector(s) within each space which shall detect the levels of carbon dioxide within the classrooms.

The high-level alarm shall detect 1,500ppm for 20 minutes and monitor a daily average less than 1,000ppm, these shall be monitored and indicated via the 'traffic light' LED's.

Toilet Area Ventilation Control

The toilet area centralised ventilation extract fan is a trickle/boost type, which shall remain in 'trickle' mode and shall enter the 'boost' mode on activation of duel output room PIR detectors and shall remain in 'boost' mode for a 10/15-minute interval. These PIR detectors shall be installed within each room/area.

The 'make up' air for the toilet area shall be provided via undercut doors to each room/area with an extract grille on the centralised ventilation system. These doors shall be undercut by the Main Contractor.

2.13 REFRIGERANT PIPEWORK

The refrigeration system shall be installed in accordance with BS 4434 (Safety and Environmental Aspects in the Design, Construction and Installation of Refrigerating Appliances and Systems), the Institute of Refrigeration Safety Codes and HSE Guidance Note PM81. The installation, testing and commissioning shall be carried out by a competent refrigeration engineer with valid F Gas certification.

The pipe work shall be of refrigerant quality copper to BS2871 Part 2, ASTM 280, DIN1754/8905 half hard tempered. Soft tempered pipe work may be used where the pipe diameter is 1/4" or 3/8". Long radius bends shall be formed using pipe bender. The use of short radius pre-formed bends and elbows should be avoided to minimise pressure drop and possibility of leaks.

Oxygen free nitrogen must be passed through the pipe work during all brazing of joints to prevent the formation of oxidisation scale on the inside surface of the pipes.

All pipe work shall be clean, de-hydrated and sealed. Pipe work shall be stored under dry conditions. Any pipe work found to be stored without the end caps should be rejected. Where sections are cut from a new coil any remaining lengths must be re-sealed. During the installation if the system has to be left unattended for any purpose whatsoever, the openings in the systems must be securely sealed.

All pipe work shall be insulated with Armaflex Class-0 type insulation, 13 mm thick. Joints and headers shall be insulated with the pre-formed insulation supplied with these fittings. Insulation exposed to atmospheric conditions shall be protected with two coats of insulation paint. All insulation joints shall be made using adhesive and care should be taken that every part of insulation is sealed to maintain a vapour barrier.

The pipe work must be supported through its entire length according to good refrigeration practice. However, the brackets must not be positioned directly on the joints or headers. On horizontal pipe work the bracketing should be over the insulation to allow pipe movement due to contraction and expansions. The vertical pipe work shall be bracketed at no more than 1000 mm centres. The horizontal pipe work shall be bracketed at no more than 1500 mm centres.

All installed pipe work lengths are to be accurately measured and recorded on the commissioning form. This information is required for accurate calculation of the additional refrigerant charge for the system. The weight of the additional refrigerant must also be recorded for future reference.

All refrigerant gases shall comply ONLY be the ozone benign type, all gases used are to be in accordance with current good practices and other subsequent agreements as stated by the UK government. All gases must have a minimum ozone depletion potential and global warming potential.

Once the installation is completed, tested and commissioned (prior to hand over) the Mechanical Contractor or their sub-Contractor shall provide a building F gas register detailing the type of system,

product gas etc. and the quantity of gas each system has been charged with. The register shall also contain maintenance schedules and numerous gas charge record schedules.

3.0 ELECTRICAL SERVICES SPECIFICATION AND SCHEDULES

3.1 ELECTRICAL SERVICES INSTALLATION DESCRITION

The Electrical Contractor shall refer to section 1.0 of this specification for project standards and general Tender information. Reference shall also be made to section 1.1.2 for project specific details and site address.

The Electrical services Contractor shall be a domestic sub-contractor to the Main/Principal Contractor.

All builders work associated with the electrical installation shall be carried out by the Principal Contractor.

It is the Electrical Contractor's responsibility to ensure that the Principal Contractor is provided with all the necessary information to enable him to undertake this work, including working drawings showing the size of any penetrations, ducts and marking out on site as necessary.

Scope of Works

- **Containment Systems** – Supply, installation & commissioning of a new electrical services containment system throughout the new Building.
- **Electrical Distribution –** Supply, installation & commissioning of a new TP&N electrical sub main supply. This new sub main supply will be installed through the existing building and be fed from the existing main distribution board located within the existing building. The sub main will be used to supply electrical power to a new TP&N distribution board within the proposed new classroom building
- **Small Power Installation** – Supply, installation & commissioning of a new small power installation for the new building as detailed within the project documentation and drawings.
- **Lighting Installation** – Supply, installation & commissioning of new internal and external lighting systems utilising low-energy LED lighting and energy saving controls.
- **Emergency Lighting Installation** – Supply, installation & commissioning of a new 3-hour emergency lighting system comprising integral emergency fittings contained within general lighting luminaires. Emergency escape signage with pictograms complying with British standard requirements shall be provided and shall be installed in co-ordination with the buildings fire escape strategy.
- **Data Installation** – Supply, installation & commissioning of a new data network with RJ45 outlets to connect to the existing data system within the existing building(s).
- **Fire Alarm Installation** – Supply, installation & commissioning of a new L3 grade fire alarm system throughout the proposed new building. This is to be incorporated with the existing fire alarm system within the existing building(s).
- **Intruder Alarm System** – Supply, installation & commissioning of new intruder alarm system points incorporating door contacts and PIR's as shown on project drawings to service the new proposed building.
- **Earthing** – Supply, installation & commissioning of all main earthing, bonding and supplementary bonding systems required by BS 7671:2018 within the new building.
- **Inspection, Testing & Commissioning –** Inspection, testing and commissioning of all electrical services upon completion of the electrical installation.

- **Record Drawings and O&M Manual –** Provision of installation drawings, operation and maintenance manuals and Client demonstration, instruction & handover of all electrical systems including equipment documentation.

- **Miscellaneous –** All other work described in this specification, contract documents and indicated in the contract drawings.

Description of Works

3.1.2 Electrical Services Infrastructure works

The Electrical Contractor shall provide a new TP&N electrical supply from the existing distribution board 'DB1' to serve the new proposed building. The Electrical Contractor shall supply, install and commission all required electrical services infrastructure works as required to meet the needs of the proposed new building. This shall include, but not limited to, the installation and commission of a new TP&N distribution board and associated equipment within the new proposed building as shown within the project documentation. This new distribution board will be supplied from a new electrical sub main.

This new sub main is to also have the appropriately sized breaker installed into the existing distribution board 'DB1' to accommodate the required electrical load of the new proposed classroom building.

3.1.3 Containment Systems

The electrical Contractor shall supply and install the electrical services containment system which shall comprise of a combination of zinc plated steel cable basket, steel galvanised conduit and steel galvanised cable tray as necessary. All containment will be required to satisfy the free space requirements specified within BS 7671:2018 along with ensuring the containment system has continuous earth continuity throughout.

The containment system shall be installed using appropriate fixings and fixing methods for their environment.

The containment system shall be sized and installed to allow for the complete segregation of LV, ELV and fire alarm services.

3.1.4 Small Power Installation

The electrical Contractor shall supply, install and commission the new small power systems including mechanical supplies to meet the requirements and in accordance with BS 7671:2018. The small power systems shall be wired using 6242B twin & earth XLPE LSOH cable. The cables shall be supported throughout their length upon zinc plated cable basket above tilled ceilings and within steel galvanised conduit elsewhere as required. The required spacing and grouping factors as set out within BS 7671:2018 are to be maintained throughout the electrical installation.

All small power circuits shall be provided protection as required by BS 7671:2018 by the use of RCBO's and AFDD's if required.

3.1.5 Lighting Installation

The electrical Contractor shall supply, install and commission the new lighting systems utilising the use of low-energy LED lighting and energy saving controls will be required throughout the proposed new building. These systems will be required to fulfil the requirements of BS 7671:2018 and BS 12464-1:2011 Lighting of work places.

The lighting systems shall be wired using 6242B Twin & Earth XLPE LSOH cable supported upon zinc plated cable basket and conduit as required. All luminaires shall be of the type specified within the project documentation or equal and approved alternatives. These luminaires are to have the appropriate IP rating for the environment in which they are to be installed.

3.1.6 Emergency Lighting Installation

The electrical Contractor shall supply, install and commission the new 3-hour emergency lighting system, comprising integral emergency fittings contained within general lighting luminaires. The installation of the lighting systems will comply with the requirements set out within BS 7671:2018 and BS 5266-1:2016.

3.1.7 Data/Telecoms Installation

The electrical Contractor shall supply, install and commission the new category 6a data network extension including ports, back boxes, cabling and containment throughout the new proposed building extension. This is to be connected to the existing data network within the existing building(s). This will include the supply and installation of a WIFI router which shall be located within a position to maximise the signal propagation throughout the building.

3.1.8 Fire Alarm Installation

The electrical Contractor shall supply, install and commission the new life protection category L3 fire alarm system for use within the proposed new building extension as detailed within the Tender documentation. This system is to be linked to and/or an extension of the existing fire alarm system contained within the existing building(s). The new fire alarm works shall be carried out in accordance with the requirements of BS5839:2017-1.

The fire alarm cabling shall be Prysmian FP200 and shall be securely retained within galvanised steel containment and/or zinc plated cable basket as appropriate throughout the installation. Appropriate separation from other cabling shall be maintained throughout.

Fire alarm interfaces shall be provided for integration of the fire alarm system with the mechanical control panels and all other M&E system elements requiring co-ordination with the fire alarm system. The Contractor shall undertake system integration with other M&E services to ensure that all necessary functionality is correct.

The Contractor shall undertake all testing and commissioning of the fire alarm system in accordance with BS 5839-1:2013 and specialist equipment manufacturers instructions. A full demonstration will be required to prove system compliance to the satisfaction of the Client, the Contract Administrator and local fire authority as required.

Full record information, including test results, operational and maintenance manuals, record drawings, zone and address designations and certification shall be provided by the contractor upon completion of works

3.1.9 Earthing

The electrical Contractor shall supply, install and commission the main earthing, bonding and supplementary bonding systems employed within the proposed new building.

3.1.10 Inspection, Testing, Commissioning, Record Drawings and O&M Manual Inspection

The electrical Contractor shall include the Provision of record drawings, operation and maintenance manuals and Client demonstration, instruction & handover of all electrical systems in accordance with section 1.0 of this specification of works.

3.2 REGULATIONS AND STANDARDS

The complete Electrical services installation shall comply with the following but not limited to the regulations, standards and statutory regulations current at time of the order for the works is placed:

- Building Regulations
- Health and Safety at Work Act
- CDM Regulations 2015
- Electricity at Work Act
- Chartered Institute of Building Services Engineers (CIBSE) standards and good working practices
- COSHH Regulations
- British Standards
- European harmonised standards (BS EN)
- Chartered Institution of Building Services (CIBSE) standards, commissioning standards, Building Energy Codes
- IET Wiring Regulations (BS7671) – Latest edition

Any conflict between the requirements as detailed within these specification/drawings and any of the above regulations/standards shall be brought to the attention of Oatway Design Ltd immediately.

3.3 SCHEDULE OF TENDER DRAWINGS

This specification should be read in conjunction with the project drawings as scheduled on the document issue sheet.

Any dimensions given on the drawings shall take preference to those which may be scaled from the drawing. The Contractor is reminded that the drawings should not be scaled from.

Should any discrepancies between the drawings and this specification be detected by the Tenderer, these should be forwarded to the Design Engineer, Contract Administrator at least four days before the date of the Tender return. Any claim for additional costs resulting from inadequate assessment will not be considered.

The Tender Drawings are prepared essentially so that, in conjunction with the Specification; a correct engineering interpretation may be put on the Scheme for the Works and a full tender prepared.

The Contractor(s) shall prepare and submit for comment/approval 'WORKING DRAWINGS' indicating all cable tray routes.

These working drawings shall be completed to include all fully coordinated services layouts to a scale no more than 1:50. The Contractor(s) shall also supply all schematic layouts of systems, and shall include the following:

- Any 'pinch point' coordination details shall be presented in a scale no more than 1:20
- Copies of Manufacturers drawings of all plant/equipment to be supplied by the Contractor(s)

- All builders' works requirements e.g. floor ducts, trenches, holes through walls/roofs etc. At a scale no more than 1:20
- All coordinated ceiling plan/grid layout drawings, at a scale no more than 1:50
- Any details of purpose-built brackets, supports, hanger, anchors required at a scale of no more than 1:20

3.4 DISTRIBUTION BOARDS

The Electrical Contractor shall supply, install and commission a new TP&N distribution board and associated equipment within the new proposed building as shown within the project documentation. This new distribution board will be supplied from a new electrical sub main.

The new electrical sub main supplying the proposed new building is to be installed, connected to and supplied from the existing main distribution board 'DB1' located within the existing building. This new sub main is to also have the appropriately sized breaker installed into the existing distribution board 'DB1' to accommodate the required electrical load of the new classroom block building.

The new distribution board within the proposed new classroom block building shall be sized appropriately and supplied by the contractor with the appropriate number of outgoing ways used with a minimum of 20% spare capacity. Refer to LV Schematic project drawing and three phase distribution schedules for detail.

All final distribution circuits shall be protected by RCBO devices and where necessary in accordance with BS 7671,2018 AFDD's should be provided if required.

The distribution board shall be suitably rated at IP4X metal in type and with a lockable incoming integral isolator switch and lockable covers to prevent unauthorised access. The Distribution board shall also be provided with permanent engraved labelling, blank plates as necessary and warning notices.

The busbars within each distribution board shall be fully rated to the capacity of the incoming isolator.

All equipment in the final circuit distribution boards shall be thoroughly cleaned inside and outside of all debris, swarf etc., and where the paintwork or finish has been damaged with one coat of oil-based paint of the appropriate manufacturers colour after erection.

Distribution boards shall be sited to achieve a minimum of 1000mm clear front access for installation and maintenance purposes.

The distribution board shall be firmly fixed in position with approved fixings. The Contractor shall supply for each distribution board a comprehensive schematic wiring diagram showing details of the incoming and outgoing circuits and have sufficient space for future additions and alterations.

All equipment in the panel boards shall be identified by suitable indelible labels.

All Metering shall meet the requirements of CIBSE TM39 – building energy metering, and Part L of the Building Regulations.

All final circuit distribution boards shall be provided with split-metering for lighting and power. In addition, any single loads or control panels drawing in excess of 10KW shall be separately metered.

All metering shall be MID compliant and shall have a MODUS or KNX output communication bus for connection.

The Contractor shall ensure the three phase supplies are balanced on completion. From the date of the completion certificate being received, the Contractor shall visit site on month 6 and 11 to monitor the load on each phase for a period of 2 days, any imbalance shall be corrected by the Contractor at no cost to the Client. These works shall be carried out at the convenience of the Client.

3.5 CONTAINMENT

The Electrical Contractor shall supply, install and commission all containment necessary to provide support and protection to electrical services throughout the new building. This shall include containment for all LV, ELV, Data, Fire Alarm, AV and Security System requirements.

All containment shall generally be of galvanised steel conduit or zinc platted cable basket. PVC-U Dado trunking will also be utilised as shown within the project documentation.

Complete segregation of LV, ELV and fire alarm services shall be maintained at all times through-out the installation.

Containment shall be provided complete with all proprietary bends, tees, sets, fixings and supports. Containment shall have a continuous earth bond throughout the installation.

LV services shall be contained at high level above ceiling tiles within zinc plated steel cable basket or galvanised steel conduit as necessary. For socket and SFCU positions within rooms PVC-U Dado trunking is to be used as shown within the project documentation and drawings. All vertical drops are to be in steel galvanised conduit.

ELV, fire alarm, security and data services shall be contained at high level above ceiling tiles within zinc platted steel basket or galvanised steel conduit as required. All vertical drops will be of steel galvanised conduit.

Containment shall be installed complete with fire barriers where runs penetrate floor slabs or through fire resistant compartmentation.

Containment penetrations through fire-resisting structural elements shall be made good upon completion of the works with fire resisting products matching the fire resistance rating of the structural element through which the containment penetrates. In addition, containment shall be protected with a heat insulating sleeve/product 1000mm either side of fire compartmentation to reduce heat conduction in the event of fire.

Drops/rises from containment runs to accessory positions shall be through the fabric of the building where practicable and shall be of galvanised steel construction. Where this proves impractical, surface runs shall be permitted and shall be via galvanised steel conduit/stainless steel conduit or dado trunking dependent upon application and environmental conditions.

New containment installed as part of the proposed works shall have as a minimum 25% spare capacity. Installed cabling shall be suitably de-rated to allow for inclusion of additional future circuits.

On completion of works all abrasions and exposed thread shall be treated with zinc-rich spray.

All as indicated below:

Installation	**Containment**	**Cabling**
Small Power	*Supported within zinc platted steel basket & steel galvanised conduit.*	*6242B twin & earth XLPE LSOH.*
Small Power	*Supported within PVC-U Dado trunking*	*6242B Twin and Earth XLPE LSOH.*
Internal Lighting	*Supported within zinc platted steel basket & steel galvanised conduit.*	*6242B Twin and Earth XLPE LSOH.*
Mechanical Services	*Supported within zinc platted steel basket & steel galvanised conduit.*	*6242B Twin and Earth XLPE LSOH.*
Data Cabling	*Supported within zinc platted steel basket & steel galvanised conduit.*	*Category 6a LSOH.*

Fire Alarm	*Supported within zinc platted steel basket & steel galvanised conduit.*	*FP200 Gold*
Telephone	*Supported within zinc platted steel basket & steel galvanised conduit.*	*8 core telephone cable LSOH*
Generic: Surface cable drops	*Contained within steel conduit*	
Generic: within plant areas	*Contained within steel conduit*	

3.6 SUB-MAINS

The Electrical Contractor shall supply, install and commission a new TP&N sub main supply to provide electrical power to the new proposed building. This new sub main cable will be BS5467 SWA XLPE in type.

The new electrical sub main cable supplying the proposed building is to be installed through the existing building above the suspended ceiling and clipped direct. The new sub main cable is to exit the existing building as close as is practical to the new building at high level. The Electrical Contractor shall then provide adequate support for the sub main cable before it enters the new proposed building at high level.

The sub main cable will be connected to and supplied from the existing main distribution board 'DB1' located within the existing building. This new sub main is to also have the appropriately sized breaker installed into the existing distribution board 'DB1' to accommodate the required electrical load of the new proposed classroom building.

All sub-main distribution cables shall be multicore SWA/XLPE/LSOH and shall be provided complete with all proprietary glands and fixings.

Sub-mains mounted within the new building shall be supported along their entire length on perforated steel tray and shall be securely fastened using nylon cable ties every 300mm. Nylon cable ties shall be supplemented with proprietary metal clips spaced at a minimum of 1 metre intervals.

Earthing distribution throughout the scheme shall be implemented using conductor's integral to armoured sub-main cables, and shall be adequately sized to carry full fault current and achieve sufficient disconnection times in accordance with the requirements of BS7671:2018.

3.7 FINAL CIRCUITS

The Electrical Contractor shall supply, install and commission all the new LV final circuit cabling.

The LV final circuit cabling shall be of 6242B Twin and Earth XLPE LSOH type or of an appropriate approved alternative for the installation environment.

Small power shall be distributed around the new building via high level steel zinc platted cable basket and galvanised steel conduit as necessary. All main circuit horizontal runs shall be located above the suspended ceiling. Socket outlets and SFCU's located around room perimeters are to be contained within PVC-U Dado trunking or galvanised steel conduit as shown within the project documentation.

LV cabling shall be installed to minimise the number of circuits in each section of containment. All installation calculations shall reflect de-rating due to grouping, insulation, anticipated ambient temperature conditions and all other factors as defined by BS7671:2018.

The Contractor shall also note that under the 18th Edition ALL final circuits in ALL locations shall be provided with adequate protection to support against premature collapse i.e. metal or fire rated clips.

3.8 LIGHTING

The Electrical Contractor shall supply, install, test and commission the new lighting installation internally and externally throughout the new proposed building. The lighting shall be of the type shown within the project documentation and the table below or of an equal and approved equivalent.

Lighting shall be designed and installed according to appropriate CIBSE and NERC guidance along with complying with the requirements of BS 12464-1 Lighting of work places and BS 7671 2018 regulations.

Luminaires shall be selected to comply with the requirements of Part L of the building regulations and shall therefore have a minimum efficacy of 60lumens/watt.

All new lighting shall be LED type and shall be provided with lighting controls appropriate to the application to achieve optimal energy savings.

All PIR presence and absence detection shall be CP electronics or approved equivalent. All lighting switch-plates and accessories shall be MK Logic Plus or approved equivalent.

Luminaires shall be suitable for the environment in which they are to be installed. Areas with a high level of moisture, salinity or corrosive chemicals shall be provided with luminaires constructed of suitably resistant materials to the appropriate IP rating. Controlled temperature environments shall be supplied with luminaires that are suitable for use in the desired operational temperature range.

All luminaires shall have a minimum colour rendering (Ra) of 80.

All luminaires shall have a colour temperature of 4000K.

The general lighting strategy is as follows:

Area	**Luminaire Description**	**Lighting Control Method**	**Light Level (Lux)**	**Uniformity**
Classroom Areas, Lobby & Store Cupboards	*Dextra Modled Slim*	*Manual*	*500*	*0.4*
Wc's, AWC & Cleaners Cupboard	*Dextra Sylvania*	*Presence*	*100*	*0.4*
Plant Room		*Manual*	*300*	*0.4*
External Lighting	*Dextra Amenity, Exterior-Open LED*	*Photocell*	*10*	*0.25*

Where recessed fittings are used as opposed to surface mounted fittings, or any other fittings that break through the fire integrity of the ceiling where this forms the horizontal fire break, the contractor shall include for the supply and installation of suitable fire boxes, hoods or blankets as per the recommendations of the luminaire manufacturer.

Specifically, any recessed luminaires used on final escape routes shall be provided with fire hoods to prevent spread of fire via the ceiling voids. All luminaires using any form of polycarbonate diffuser shall be compliant with the spread of flame criteria as set out in the Building Regulations and shall have passed the" Hot Wire" test.

The Contractor shall also note that under the 18th Edition ALL final circuits in ALL locations shall be provided with adequate protection to support against premature collapse i.e. metal or fire rated clips.

3.9 EMERGENCY LIGHTING

The Contractor shall supply, install, test and commission a complete and functioning emergency lighting system to allow for safe egress in the event of a local or total mains failure within the building.

Emergency lighting shall be integral to the general lighting luminaires. These luminaires shall have emergency 3-hour, self-testing capabilities along with an LED status indicator and shall be installed in accordance with bs7671:2018 and the requirements of BS5266:2016.

The Emergency Lighting criteria is detailed below:

Area	Illumination (Lux)
Unobstructed escape route	1
Kitchenettes, Reception	15
Fire Extinguishers, Manual call points, security devices, etc.	5
High risk task areas	10% of general lighting requirement

Emergency lighting test key switches shall be positioned adjacent lighting distribution board to enable isolation and test of emergency lighting as a back-up to the self-test functionality described above.

3 Hour maintained self-illuminated emergency exit signs will be provided as part of a coordinated fire escape strategy in accordance with BS 5499 and the recommendations of the fire risk assessment within the new building.

The Contractor shall test and commission the complete installation upon completion and provide a certificate in accordance with BS5266:2016 before handover. A separate demonstration of the system will be required to be carried out by the Contractor for the Client or their approved representative and the building services engineer.

The electrical Contractor shall ensure all the emergency fittings are CE stamped and comply with the EMC directive and BS EN 60598-2-22. All emergency signage shall be compliant with The Health and Safety (Safety signs and signals) Regulations 2005 and ISO 3864/ISO 7010.

3.10 SMALL POWER

The Electrical Contractor shall supply, install and commission the new small power installation throughout the proposed new building extension.

LV final circuit cabling shall be of 6242B Twin and Earth XLPE LSOH in type or of an appropriate alternative for the installation environment.

Small power accessories shall be MK or Client approved equivalent.

All sockets and accessories other than those contained within dado trunking shall generally be flush-mounted. Where this is not practical surface mounted steel galvanised conduit shall be used to supply points of utilisation.

Socket outlets marked as ‘WP’ within the project documentation and drawings shall be of an IP65 weather proof type. These socket outlets shall be installed above the dado trunking in all locations marked within the project drawings. The Electrical Contractor is to ensure that all socket outlets installed within spray range of any water outlet is of an appropriate type and in an approximate location.

The quantity of sockets and accessories shall be as per the project documentation shows.

The location of all final sockets and accessories shall be agreed with the Client prior to 1st fix installation beginning.

Socket outlets shall incorporate outboard rocker switches of a contrasting colour to the socket and shall satisfy all other requirements of part M of the building regulations for identification and ease of use.

The Contractor shall ensure that small power outlets are suitable for the connected equipment and the environment in which they are installed.

The Contractor shall ensure that no point within the building is further than 8 metres from a dedicated cleaners' socket at all times.

13 Amp switch fused connection units shall be provided for fixed items of equipment. 13 Amp unswitched fused connection units shall be provided for all access control and intruder alarm equipment.

A red, double pole, key switch fused connection unit complete with neon indicator shall be provided for the fire alarm main panel.

Power supplies shall be provided as required adjacent all items of mechanical plant and equipment. The cable type and method of support and protection shall be of a suitable type for the installation environment.

Multicore flexible LSOH cable shall be provided by the Contractor for the supply of all security systems, ancillary systems and mechanical plant and equipment. Final connections shall be the responsibility of the security/ancillary/mechanical system installer.

The Contractor shall also note that under the 18th Edition ALL final circuits in ALL locations shall be provided with adequate protection to support against premature collapse i.e. metal or fire rated clips.

3.11 DATA INSTALLATION

The Contractor shall supply, install and commission a category 6a structured data network for use within the proposed new building as indicated within the project documentation. This shall include all back boxes, connection plates and cabling.

Category 6a cabling shall be provided for all IT Network and Telephone applications. Cat 6a data cable shall be foiled, shielded, twisted pair with low smoke zero halogen insulation and sheathing.

The Contractor shall supply and install the required data network equipment to extend the existing data network to include the new proposed building. All cables shall be identified and made off using a manufacturer approved connection tool. All patch panels and connection points shall be labelled for ease of identification.

Data accessory plates shall be double RJ45 outlets.

The Contractor shall provide sufficient PoE wifi access points for use within the new proposed building.

3.12 FIRE ALARM SYSTEM

The Electrical Contractor shall supply, install and commission a new life protection category L3 fire alarm system for use within the proposed new building. This system is to be linked to or an extension of the existing fire alarm system contained within the existing building. The new extension to the fire alarm system is to include all points shown within the project documentation. The new fire alarm works shall be carried out in accordance with the requirements of BS5839:2017-1.

Fire alarm cabling within shall be Prysmian FP200 and shall be securely retained within galvanised steel containment or zinc platted steel cable basket throughout the installation.

Manual call points (MCP's) shall be installed adjacent all final exits and shall be sited no higher than 1.2 metres above finished floor level to the top of the device. MCP's shall be provided with lift up flaps to guard against accidental activation.

The Contractor shall ensure that loop isolators are employed within the fire alarm scheme, conforming to the recommendations of BS5839-1:2017.

The Contractor shall ensure that all voids over 800mm in depth are provided with automatic smoke detection and remote indicators.

Fire alarm sound pressure levels shall be 65dBA throughout the building and local supplementary visual indication devices shall be provided where necessary.

Fire alarm interfaces shall be provided for integration of the fire alarm system with the mechanical control panels and all other M&E system elements requiring co-ordination with the fire alarm system. The Contractor shall undertake system integration with other M&E services to ensure that all necessary functionality is correct.

The Contractor shall undertake all testing and commissioning of the fire alarm system in accordance with BS 5839-1:2013 and specialist equipment manufacturers instructions. A full demonstration will be required to prove system compliance to the satisfaction of the Client, the Contract Administrator and local fire authority as required.

Full record information, including test results, operational and maintenance manuals, record drawings, zone and address designations and certification shall be provided by the contractor upon completion of works.

3.13 ELECTRICAL SERVICES FOR MECHANICAL INSTALLATION

The mechanical plant and controls equipment in the building shall be supplied and installed under the Mechanical Sub-Contract works.

The Electrical Sub-Contractor shall carry out all controls wiring from the mechanical services control panels to items of equipment as required. The Electrical Sub-Contractor shall include for providing all cable tray containment within the building and cable trunking containment systems within the plant room for the wiring of controls and power supplies.

3.14 LIGHTNING & SURGE PROTECTION

The Contractor shall employ and fully liaise with a Specialist Contractor to design, supply, install and commission a new lightning & surge protection system for the proposed new building as required by BS7671, 2018.

The lightning protection system shall be designed in accordance with BS EN 62305:2011

The lightning protection system shall comprise an air termination network, down conductors and earth termination network complete with test points. All elements of exposed metalwork at roof level (or within the required protective zone) shall be bonded to the system.

Test joints shall be installed on all the down conductors and shall comprise of bi-metallic connections.

All lightning protection works shall be carried out by a lightning Protection System Specialist.

The layout of any exposed surface tapes shall be agreed with the Client and Architect.

Surge protection shall be provided on all incoming electrical services.

Type 1 & 2 surge protection for LV & ELV services shall be provided to comply with BS EN 62305:2011 (in accordance with the BS7671 2018 surge protection must be provided unless a calculated risk assessment is provided)

3.15 EARTHING SYSTEM

The Electrical Contractor shall ensure the whole of the earthing and bonding installation shall be in accordance with the requirements of BS 7671:2018, Regional Electricity Company requirements, BS 7430, and other relevant British Standards and Codes of Practice.

The contractor will comply fully with the edition (including amendments) of each of the following, current at the time of tender.

BS 951 Electrical earthing. Clamps for earthing and bonding purposes. Specification
BS 4444 Guide to electrical earth monitoring and protective conductor proving.
BS 5958 Code of Practice for control of undesirable static electricity.
BS 7361 Cathodic protection.
BS 7361-1 Part 1: Code of practice for land and marine applications
BS 7430 Code of practice for earthing
BS 7671 Requirements for Electrical Installations. IET Wiring Regulations
BS EN 13599 Copper and copper alloys. Copper plate, sheet and strip for electrical purposes
BS EN 13601 Copper and copper alloys. Copper rod, bar and wire for general electrical purposes
BS EN 13636 Cathodic protection of buried metallic tanks and related piping
BS EN 15112 External cathodic protection of well casing
BS EN 62305 Protection against lightning

The Electrical Contractor shall prove each circuit protective conductor prior to making any supplementary bonding connections or alteration to existing systems.

The Electrical Contractor shall ensure all enclosures, equipment, exposed conductive parts, extraneous conductive parts, metallic trunking, metallic conduits, metallic cable trays and any other metalwork, other than any live part, forming protection or part of the electrical installation, including apparatus and appliances, are effectively bonded to earth and do not form part of the earth fault path of the protective conductor system.

The Electrical Contractor shall ensure all LV socket outlets have a green/yellow PVC insulated 2.5 sq mm stranded copper conductor as a 'fly lead' connected between earth terminals secured to both socket assembly and socket box. Each lighting switch grid shall be provided with an earth terminal and 'fly lead' as detailed above. Provide fly leads as described above for all hinged panels of switches, switchgear, control cubicles, distribution boards, etc. Route/protect the 'fly leads' to obviate damage to the cables when panels are opened and closed.

Ensure all main water pipes, main gas pipes other service pipes and ventilation ducting (including ductwork flexible connections, riser of central heating and air conditioning systems) oil pipe services, storage tank, piped gas systems, etc, and the exposed metallic parts of the building structure are effectively connected to the main earthing terminal points using, where applicable, earthing clamps which conform to BS 951.

The Electrical Contractor shall ensure the installation has all incoming services bonded to earth at the point of entry. For the purposes of this clause a building is defined as a separate structure. Structures linked by corridors, subways or bridges are considered to be separate structures.

The Electrical Contractor shall bond together services entering/leaving plant rooms, boiler houses, calorifier rooms, bathrooms, kitchens and other wet-process areas, and bond to the electrical installation protective

conductor system. Extraneous metalwork to be bonded includes: metal ceiling grids by bonding each primary grid member using a 4 sq. mm PVC insulated copper conductor, suspended metal floor systems including supports/frames; minimum two bonds per room plus one additional bond per fifty square metres.

All other exposed metallic parts and equipment permanently secured to or forming part of the building structure including exposed metalwork of hollow partitions and separate sections of duct/pipework insulation metallic covering Ensure that all exposed or extraneous conductive parts, having a resistance to earth of less than one megohm are bonded to the electrical services earth.

3.16 SCHEDULE OF MOUNTING HEIGHTS

Ref	**Mounting Heights (AFFL) min**	**Notes**
Light Switches	900mm to bottom	
Permanently Wired Switches	400mm + 1200mm	
Switches and Controls requiring hand movements	750mm to bottom	
Utility Meters	1200mm to bottom	
Sockets Outlets	450mm to bottom	
Telephone and TV Sockets	1000mm to top (max)	To be a minimum of 350mm from corner wall

APPENDIX A – MECHANICAL & ELECTRICAL SERVICES TENDER SUMMARY

Summary of Tender Form

1.	Preliminaries	£
2.	Ventilation installation	£
3.	Above Ground Drainage	£
4.	Domestic (Hot & Cold) Water Services	£
5.	Air Source Heat Pump (ASHP) Underfloor Heating System	£
6.	Artificial internal, External lighting systems and Emergency lighting	£
7.	Fire Alarm System	£
8.	Small Power/Data/AV/WIFI	£
9.	Security System	£
10.	Builders work in connection	£
11.	Provision of staff training record and O&M information	£
12.	Provisional Sums:	
	1. Contingency	£ 3,000.00
	Sub Total:	**£**
	TENDER TOTAL (Exc. VAT):	**£**

Signed…… Date…….

For and on behalf of ……

APPENDIX B – MECHANICAL AND ELECTRICAL DOCUMENT ISSUE SHEET

OATWAY design
consulting engineers

Ground Floor, Scott Lodge, Scott Road, Plymouth, PL2 3DU
Tel: 01752 569365 Email: office@oatwaydesign.co.uk

'The heart of the building'

DOCUMENT CONTROL SHEET – Page 1 of 1

PROJECT NAME : New Classroom Block, Trewirgie Primary School

DOCUMENT TITLE : Project Document Issue Sheet

DOCUMENT No. : P1208

Document Title	Document No.	Revision/Date									
			22 08 19	30 09 19							
Mechanical Services Ground Floor Above Ground Drainage and Domestic Hot and Cold-Water Services Layouts	P1208-M(52/53)100		P0	T0							
Mechanical Services Ground Floor Heating Services Layout	P1208-M(56)100		P0	T0							
Mechanical Services Ground Floor Ventilation Services Layout	P1208-M(57)100		P0	T0							
Electrical Services Ground Floor Electrical and Data Services Layout	P1208-E(51)100		P0	T0							
Electrical Services Ground Floor Fire Alarm Services Layout	P1208-E(52)100		P0	T0							
Electrical Services Ground Floor Lighting Services Layout	P1208-E(53)100		P0	T0							
Electrical Services Ground Floor Auxiliary and Containment Layouts	P1208-E(61/54)100		P0	T0							
Mechanical and Electrical Services External Services Layout	P1208-ME(50)100		P0	T0							
Electrical Services Low Voltage Schematic Layout	P1208-E(50)SCH001			T0							
Project Specification of Works	P1208			T0							
Project Designers Risk Assessment	P1208			T0							

Distribution	Company	No Copies									
Tom Unwin	Faithful + Gould	1	1								
Media Issue		E	E								

Media Issue Key: E-mail (**E**), Disc/CD (**D**), Paper (**P**)

APPENDIX C –ELECTRICAL CABLE CALCULATIONS/DISTRIBUTION BOARD SCHEDULE

CIRCUIT REFFERANCE & CALCULATIONS

THE ELECTRICAL CONTRACTOR IS TO APPLY DIVERSITY CALCULATIONS TO THE FOLLOWING FIGURES
ALL CALCULATIONS ARE ESITMATES

LIGHTING FINAL CIRCUITS

No:	Cct Ref	Description	No: Outlets Served	L-N Cable CSA (mm)	CPC Cable CSA (mm)	Circuit Type	Circuit Length (m)	Circuit Phase Type	Watts (W)	Total Power (W)	Power Facotr (pf)	Volts (V)	Current 1 phase (A)	Current 3 phase (A)	Volt Drop 1 phase (V)	Volt Drop 3 phase (V)	Cable Type	Protect Device Type	Protective Device Rating (A)	Breaking Capacity (KA)	RCBO (mA)
1	1L1	Lobby, WC's, Accessable WC & Cleaners Store Lighting	10	1.5	1	Radial	18	1 phase	27	270	0.9	230	1.30	n/a	0.68	n/a	6242B	61009	6	10	30
1	1L2	Plant Room, Classroom 03 & Classroom 08 Storerooms Lighting	4	1.5	1	Radial	6	1 phase	27	108	0.9	230	0.52	n/a	0.09	n/a	6242B	61009	6	10	30
1	1L3	Classroom 03 Lighting	13	1.5	1	Radial	16	1 phase	27	351	0.9	230	1.70	n/a	0.79	n/a	6242B	61009	6	10	30
2	2L1	Classroom 08 Lighting	13	1.5	1	Radial	16	1 phase	27	351	0.9	230	1.70	n/a	0.79	n/a	6242B	61009	6	10	30
2	2L2	External Lighting	10	1.5	1	Radial	45	1 phase	10	100	0.9	230	0.48	n/a	0.63	n/a	6242B	61009	6	10	30

POWER FINAL CIRCUITS

1	1L1	Accessable WC Hand Dryer SFCU	1	2.5	1.5	Radial	5	1 phase	2000	2000	0.9	230	9.66	n/a	0.87	n/a	6242B	61009	10	10	30
1	1L2	WC 05 Hand Dryer SFCU	1	2.5	1.5	Radial	5	1 phase	2000	2000	0.9	230	9.66	n/a	0.87	n/a	6242B	61009	10	10	30
1	1L3	WC 11 Hand Dryer SFCU	1	2.5	1.5	Radial	6	1 phase	2000	2000	0.9	230	9.66	n/a	1.04	n/a	6242B	61009	10	10	30
2	2L1	WC 07 Hand Dryer SFCU	1	2.5	1.5	Radial	7	1 phase	2000	2000	0.9	230	9.66	n/a	1.22	n/a	6242B	61009	10	10	30
2	2L2	Lobby, Cleaners Cupboard, WIFI socket outlets & Cleaners Cup'd Heater	6	2.5	1.5	Radial	15	1 phase	500	3000	0.9	230	14.49	n/a	3.91	n/a	6242B	61009	20	10	30
2	2L3	Plant Room Socket Outlet & Extract Fan SFCU	3	2.5	1.5	Radial	5	1 phase	300	900	0.9	230	4.35	n/a	0.39	n/a	6242B	61009	16	10	30
3	3L1	Classroom 03 Dado Trunking Socket Outlets	6	2.5	1.5	Radial	10	1 phase	300	1800	0.9	230	8.70	n/a	1.57	n/a	6242B	61009	20	10	30
3	3L2	Classroom 03 socket outlets	6	2.5	1.5	Radial	21	1 phase	300	1800	0.9	230	8.70	n/a	3.29	n/a	6242B	61009	20	10	30
3	3L3	Classroom 03 MVHR SFCU	1	2.5	1.5	Radial	10	1 phase	2000	2000	0.9	230	9.66	n/a	1.74	n/a	6242B	61009	16	10	30
4	4L1	Classroom 08 Socket Outlets	6	2.5	1.5	Radial	25	1 phase	300	1800	0.9	230	8.70	n/a	3.91	n/a	6242B	61009	20	10	30
4	4L2	Classroom 08 Dado Trunking Socket Outlets	6	2.5	1.5	Radial	10	1 phase	300	1800	1	230	7.83	n/a	1.41	n/a	6242B	61009	20	10	30
4	4L3	Classroom 08 MVHR SFCU	1	2.5	1.5	Radial	14	1 phase	2000	2000	0.8	230	10.87	n/a	2.74	n/a	6242B	61009	16	10	30
5	5L1	AWC System Alarm, Powered Door & Cleaners Store Fan SFCU's	3	2.5	1.5	Radial	15	1 phase	200	600	0.9	230	2.90	n/a	0.78	n/a	6242B	61009	10	10	30
5	5L2	Store Cupboard 04 Water Heater SFCU	1	2.5	1.5	Radial	5	1 phase	3000	3000	0.9	230	14.49	n/a	1.30	n/a	6242B	61009	16	10	30
5	5L3	Store Cupboard 09 Water Heater SFCU	1	2.5	1.5	Radial	7	1 phase	3000	3000	0.9	230	14.49	n/a	1.83	n/a	6242B	61009	16	10	30
6	6L1	Plant Room UFH Manifold & Internal Heat Pump SFCU's	2	4	2.5	Radial	5	1 phase	2500	5000	0.9	230	24.15	n/a	1.33	n/a	6242B	61009	32	10	30
6	6L2	Cleaners Socket Outlets	3	2.5	1.5	Radial	20	1 phase	300	900	0.9	230	4.35	n/a	1.57	n/a	6242B	61009	16	10	30
6	6L3	Plant Room Water Heater SFCU (For AWC)	1	2.5	1.5	Radial	4	1 phase	3000	3000	0.9	230	14.49	n/a	1.04	n/a	6242B	61009	16	10	30
7	7L1,2,3	Condensor TP&N Isolator	1	6	4	Radial	18	3 phase	23000	23000	1	400	FALSE	36.80	FALSE	n/a	6242B	61009	40	10	30

APPROXIMATE TOTAL PHASE LOAD WITHOUT DIVERSITY APPLIED:	L1	103.57
APPROXIMATE TOTAL PHASE LOAD WITHOUT DIVERSITY APPLIED:	L2	97.32
APPROXIMATE TOTAL PHASE LOAD WITHOUT DIVERSITY APPLIED:	L3	102.02

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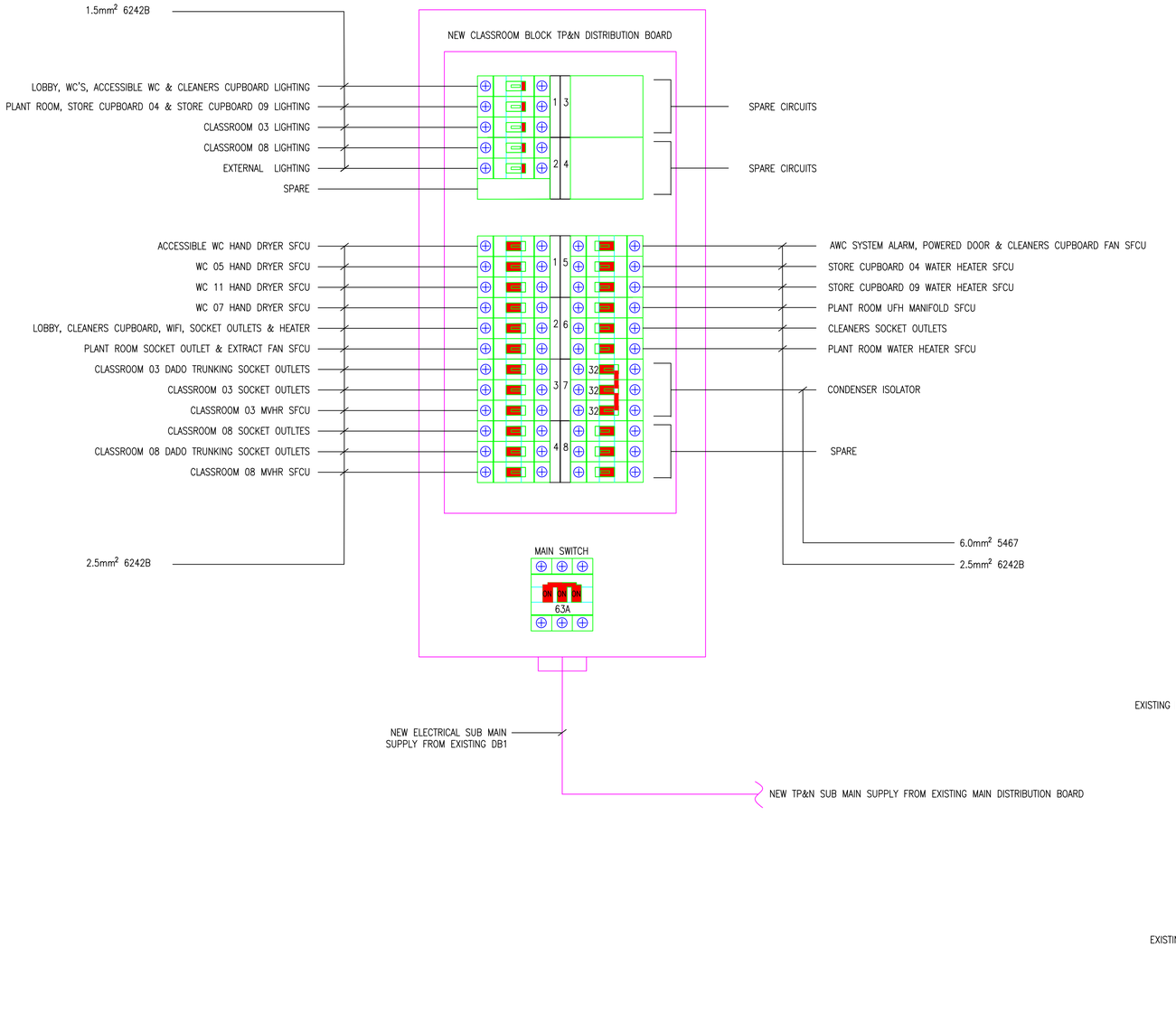
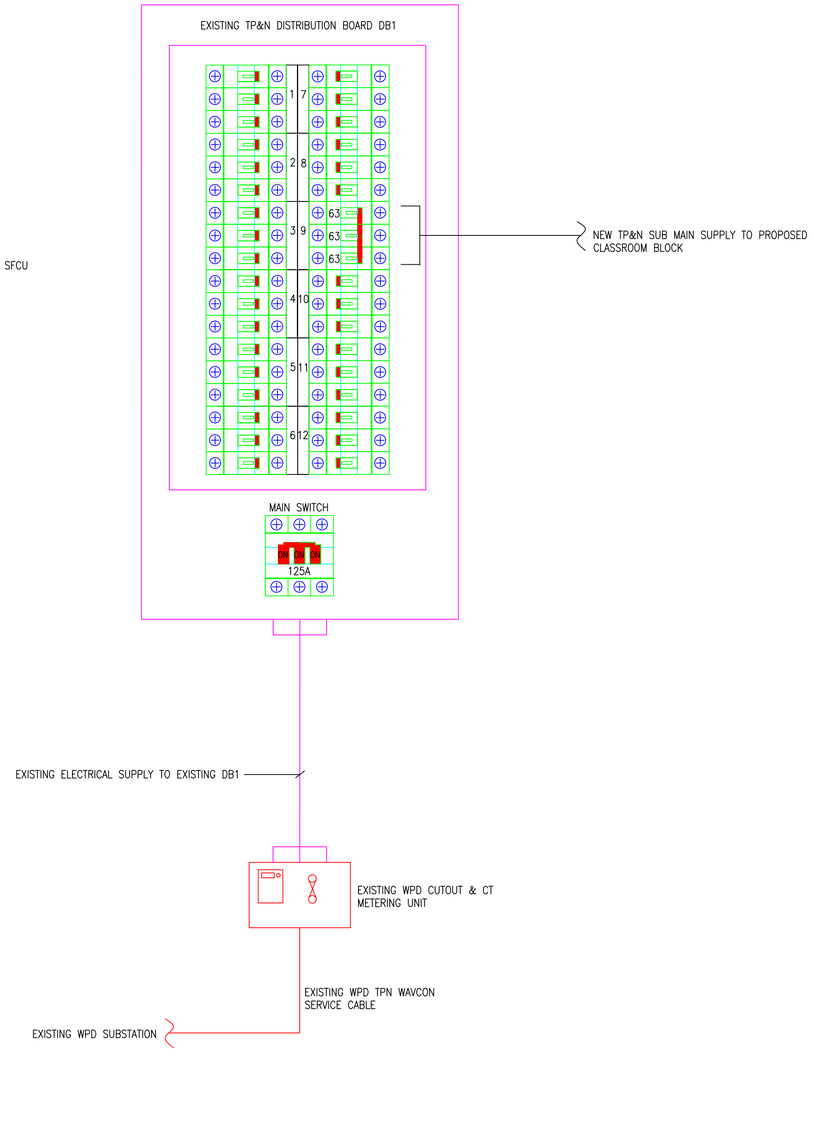
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL CONSULTANTS, SUB-CONSULTANTS AND ARCHITECTS PROJECT DRAWINGS.
5. ALL ELECTRICAL ITEMS SHALL BE DESIGNED, SUPPLIED,INSTALLED AND TESTED IN ACCORDANCE WITH BS7671 18TH.
6. ALL EARTHING SHALL BE IN ACCORDANCE WITH BS7671.
7. NEW TP&N DISTRIBUTION BOARD TO BE SCHNEIDER ACTI9, B P- SPLIT METERED TP&N 8+4 WAY, METERED WITH 63A TRIPLE POLE MAIN SWITCH.





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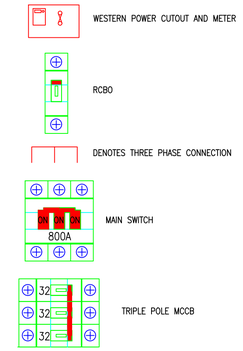

Date	Description	Rev	By

Revision Schedule

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consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Electrical Services
Low Voltage Schematic Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: LM	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-E(50)SCH001

Rev: T0

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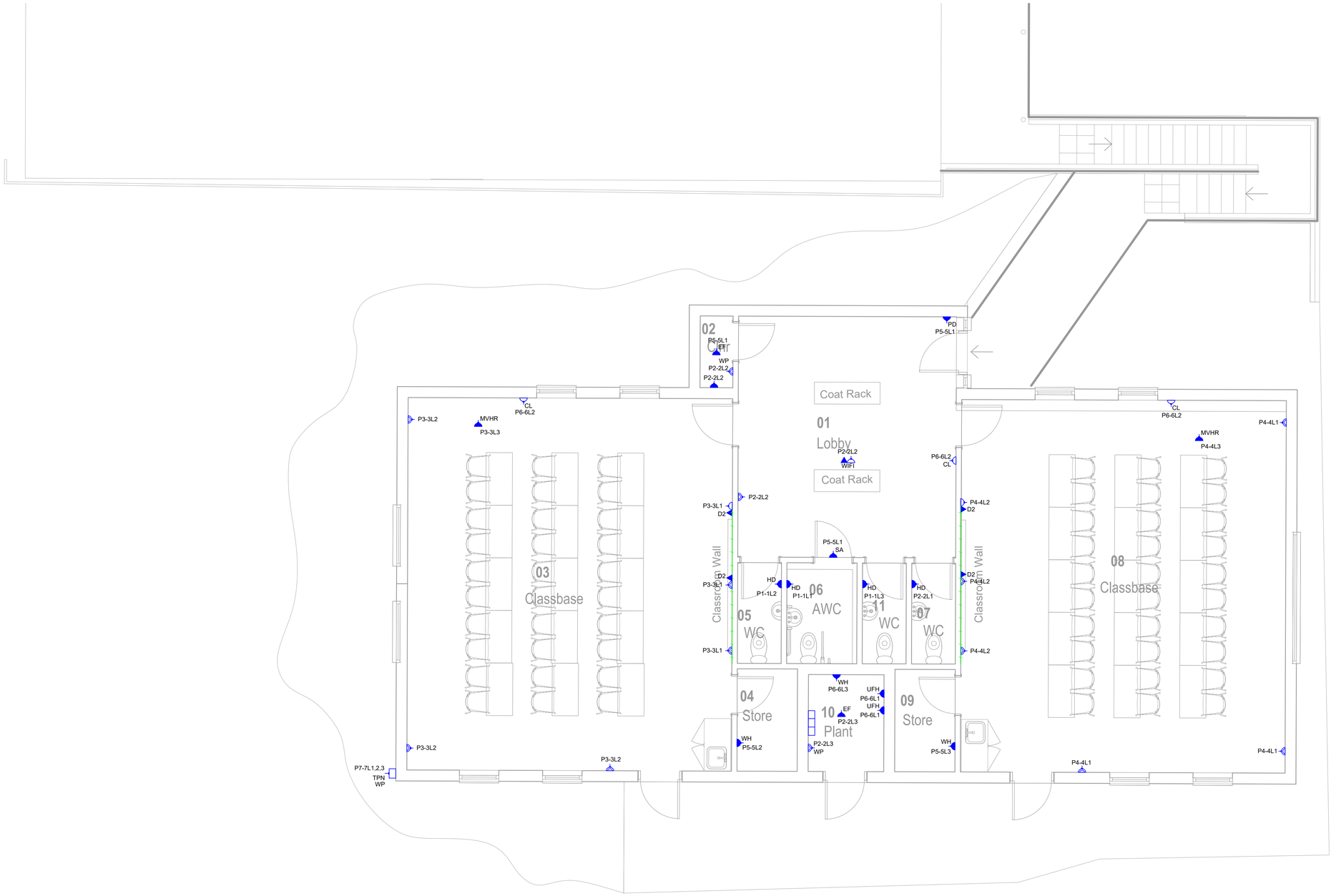
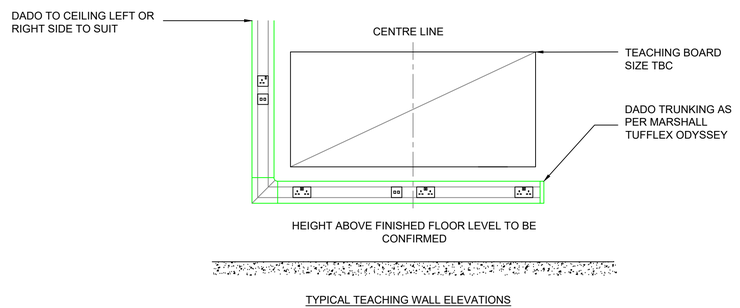
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL CONSULTANTS, SUB-CONSULTANTS AND ARCHITECTS PROJECT DRAWINGS.
5. ALL QUANTITIES AND FINAL LOCATIONS TO BE AGREED WITH CLIENT BEFORE 1ST FIX INSTALLATION BEGINS.
6. IT IS ASSUMED THAT A SUSPENDED CEILING WILL BE INSTALLED WITH A MINIMUM VOID DEPTH OF 300/450mm AND A MAXIMUM OF 750mm.
7. ALL ELECTRICAL ITEMS SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH BS7671 18TH.
8. ALL EARTHING SHALL BE IN ACCORDANCE WITH BS7671 18TH.
9. ALL FCU's SHALL BE ENGRAVED WHERE SERVING FIX ITEMS OF EQUIPMENT I.E. HOT WATER CYLINDER ETC.
10. TYPE 1 & 2 SURGE PROTECTION TO BE PROVIDED WHERE REQUIRED.
11. METERING SHALL BE PROVIDED IN ACCORDANCE WITH PART L.
11. ALL AREAS SHALL BE PROVIDED AS NECESSARY WITH OVER VOLTAGE WARNING SIGNAGE (400V) TO COVER TPN/MULTIPLE PHASES WITHIN AREA.
12. DADO TRUNKING TO BE MARSHELL TUFFLEX ODYSSEY. HEIGHT ABOVE FINISHED FLOOR LEVEL & SIZE OF TEACHING BOARD TO BE CONFIRMED BY CLIENT BEFORE INSTALLATION.





TYPICAL TEACHING WALL ELEVATIONS

ABBREVIATIONS

EF	EXTRACT FAN
FR	FRIDGE
DW	DISHWASHER
HL	HIGH LEVEL
FA	FIRE ALARM
DKS	DOUBLE POLE KEYSWITCHED
LL	LOW LEVEL
WH	WATER HEATER
HD	HAND DRYER
CV	CEILING VOID
D1	SINGLE DATA OUTLET
D2	DOUBLE DATA OUTLET
WIFI	WI-FI OUTLET/ACCESS POINT CONNECTION
WP	WEATHER PROOF IP65
MC	METAL CLAD
NVR	CCTV RECORDER/HEAD END
SEC	SECURITY HEAD END
MVHR	MECHANICAL VENTILATION HEAR RECOVER UNIT
PD	POWERED DOOR
PU	PRESSURE UNIT
HP	HEATPUMP
AC	FAN COIL
TPN	TRIPLE POLE & NEUTRAL
SPN	SINGLE POLE & NEUTRAL
TBC	TO BE CONFIRMED
SA	SYSTEM ALARM

LEGEND

	DATA OUTLET/BT CONNECTION POINT
PB	PUSH BUTTON FOR POWERED DOORS
	SWITCHED FUSE CONNECTION UNIT
	SWITCHED FUSE CONNECTION UNIT WITH NEON INDICATOR
	TWIN 13A SWITCHED SOCKET OUTLET
	SINGLE 13A SWITCHED SOCKET OUTLET
	TPN DISTRIBUTION BOARD
	SPN ISOLATOR
	MARSHALL TUFFLEX ODYSSEY DADO TRUNKING
WIFI	WIFI POINT WITH SINGLE 13A SOCKET OUTLET & SINGLE RJ45 DATA POINT

Date	Description	Rev	By
Sept 19	Clients Comments Incorporated and Issued for Tender	T0	SO

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consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Electrical Services
Ground Floor Electrical & Data Services Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: LM	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-E(51)100

Rev: T0

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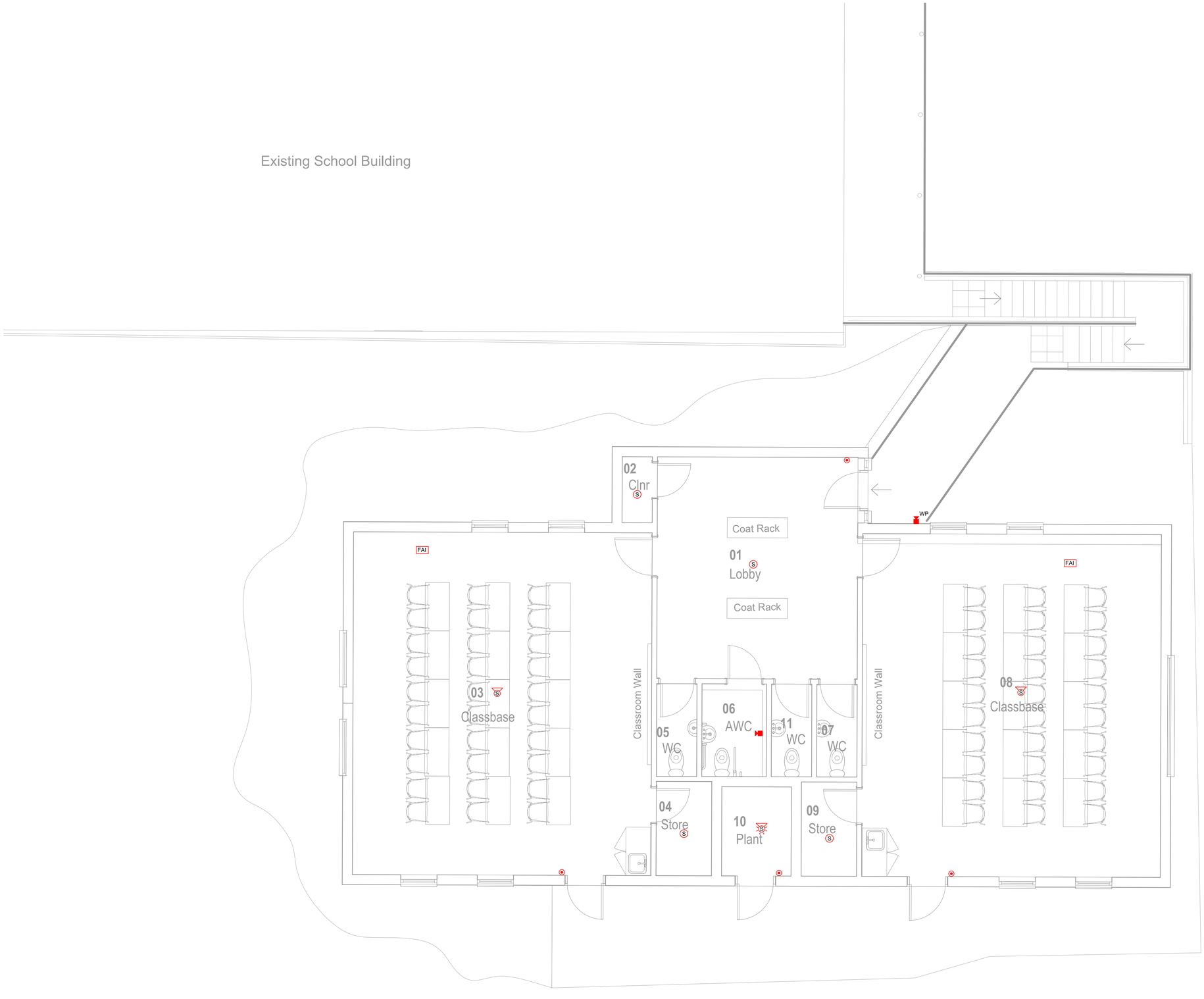

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5. THE FIRE ALARM SHALL BE TO BS5839 2017 PART 1 AS AN L3 GRADE SYSTEM.
6. TOILETS ARE DEEMED TO BE LOW RISK AREAS AND THEREFORE ARE PROVIDED WITH AUDIBLE/VISUAL ALARM DEVICES ONLY.
7. VOID DEPTHS HAVE BEEN REQUESTED NOT TO EXCEED 450mm AND THEREFORE DO NOT REQUIRE VOID DETECTION.
8. THE CONTRACTOR SHALL CONFIRM IF FAI'S FOR ACCESS CONTROL DOORS AND LANDLORDS LINK IS REQUIRED, FOR TENDER AND COSTING AN ALLOWANCE SHALL BE MADE WITHIN CONTRACTORS TENDER SUM.

LEGEND

(S)	SMOKE DETECTOR
(H)	HEAT DETECTOR
(S)	SMOKE DETECTOR WITH SOUNDER
(H)	HEAT DETECTOR WITH SOUNDER
(S)	SMOKE DETECTOR WITH SOUNDER AND BEACON
(H)	HEAT DETECTOR WITH SOUNDER AND BEACON
FAI	FIRE ALARM INTERFACE UNIT
	COMBINED SOUNDER WITH BEACON
	MANUAL CALL POINT
FAP	FIRE ALARM PANEL
FARP	FIRE ALARM REPEATER PANEL
PSU	POWER SUPPLY UNIT

ABBREVIATIONS

WP	WEATHER PROOF IP65
CV	CEILING VOID
GSV	GAS SAFETY VALVE

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consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Electrical Services
Ground Floor Fire Alarm Services Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: LM	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
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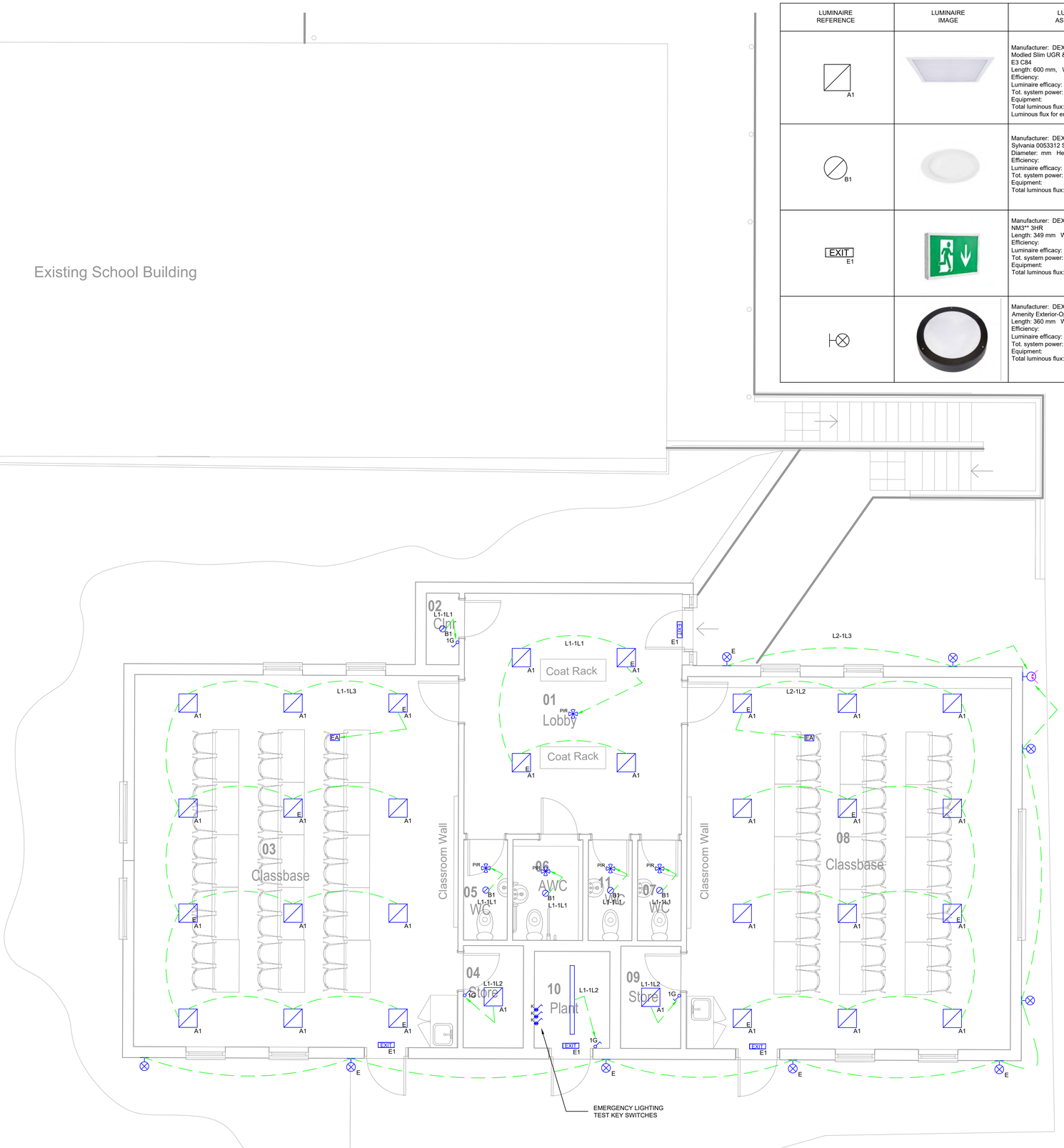
Drawing Number: P1208-E(52)100

Rev: T0

NOT FOR CONSTRUCTION

LUMINAIRE REFERENCE	LUMINAIRE IMAGE	LUMINAIRE DETAILS: AS SHOWN OR EQUAL
A1		Manufacturer: DEXTRA Modled Slim UGR & Modled Slim UGR Emergency Mod*U L45 E3 C84 Length: 600 mm, Width: 600 mm, Height: 68 mm Efficiency: 100% Luminaire efficacy: 127 lm/W (A50, ↓ 100.0% ↑ 0.0%) Tot. system power: 27.7 W Equipment: LED Total luminous flux: 2939 lm Luminous flux for emergency lighting: 300 lm (9.0%)
B1		Manufacturer: DEXTRA Sylvania 0053312 Syfflat Dim Round Diameter: mm Height: mm Efficiency: 100% Luminaire efficacy: lm/W (A80, ↓ 100.0% ↑ 0.0%) Tot. system power: 22.7 W Equipment: LED Total luminous flux: 2000 lm
EXIT E1		Manufacturer: DEXTRA NM3** 3HR Length: 349 mm Width: 195 mm Efficiency: 100% Luminaire efficacy: 77 lm/W (A80, ↓ 100.0% ↑ 0.0%) Tot. system power: 3.5 W Equipment: LED Total luminous flux: 54 lm
		Manufacturer: DEXTRA Amenity Exterior-Open LED Length: 360 mm Width: 360 mm Efficiency: 90 % Luminaire efficacy: up to 99 lm/W (A80, ↓ 100.0% ↑ 0.0%) Tot. system power: 10.1 W Equipment: LED Total luminous flux: 1000 lm



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4. THE COMPLETE ELECTRICAL, IN ASSOCIATION WITH LIGHTING, INSTALLATION SHALL BE IN ACCORDANCE WITH BS7671, 18TH EDITION 'REQUIREMENTS FOR ELECTRICAL INSTALLATIONS'.
5. THE COMPLETE EMERGENCY LIGHTING INSTALLATION SHALL BE INSTALLED IN ACCORDANCE WITH BS5266:2016.
6. BANKS OF TEST SWITCHES SHALL BE LOCATED NEXT TO DISTRIBUTION PANEL.
7. ALL LUMINAIRES SHALL BE ORDERED WITH MANUFACTURER DRIVERS AS NECESSARY.
8. DIRECTIONAL ESCAPE SIGNAGE TO BE CONFIRMED, VIA FIRE OFFICER AND SHALL BE PROVIDED BY MAIN CONTRACTOR.
9. LIGHTING TO BE CONTROLLED VIA MANUAL SWITCHES LOCATED AS INDICATED ON DRAWINGS.
10. LIGHTING WITHIN CLASSROOMS WILL BE CONTROLLED VIA DEXTRA REATA-AIR WIRELESS DAYLIGHT SAVING SYSTEM.
11. LIGHTING DESIGN HAS BEEN CALCULATED AT A CEILING HEIGHT OF 2.4m.
12. EXTERNAL LIGHTING WILL BE CONTROLLED VIA A PHOTOELECTRIC CELL AS SHOWN ON DRAWING.
13. WC & AWC LIGHTING SHALL BE CONTROLLED VIA THE DUEL OUTPUT PRESENCE DETECTING PIR. (PIR TO OPERATE LIGHTING AND VENTILATION), REFER TO SPECIFICATION OF WORKS FOR DETAILS.

LEGEND

- 600 x 600 CEILING GRID LIGHT FITTING. XX DENOTES FITTING TYPE (REFER TO LEGEND FOR DETAILS)
- B1 — ROUND RECESSED CEILING GRID LIGHT FITTING. XX DENOTES FITTING TYPE
- 1G — 10A 1 GANG, 1 WAY MANUAL LIGHT SWITCH
- 1G — 10A 1 GANG, 2 WAY MANUAL LIGHT SWITCH
- E — 'E' DENOTES EMERGENCY LIGHT FITTING OF TYPE DESIGNATED BY XX
- EXIT — MAINTAINED/NON MAINTAIN 3HR EMERGENCY EXIT
- PIR — CEILING MOUNTED 360 DEGREE PRESENCE DETECTOR
- K — EMERGENCY LIGHTING KEY SWITCH
- EXTERNAL WEATHER PROOF WALL MOUNTED LIGHT FITTING
- EA — DEXTRA REACTA-AIR PRESENCE DETECTOR
- PHOTOELECTRIC CELL

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consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Electrical Services
Ground Floor Lighting Services Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: LM	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-E(53)100

Rev: T0

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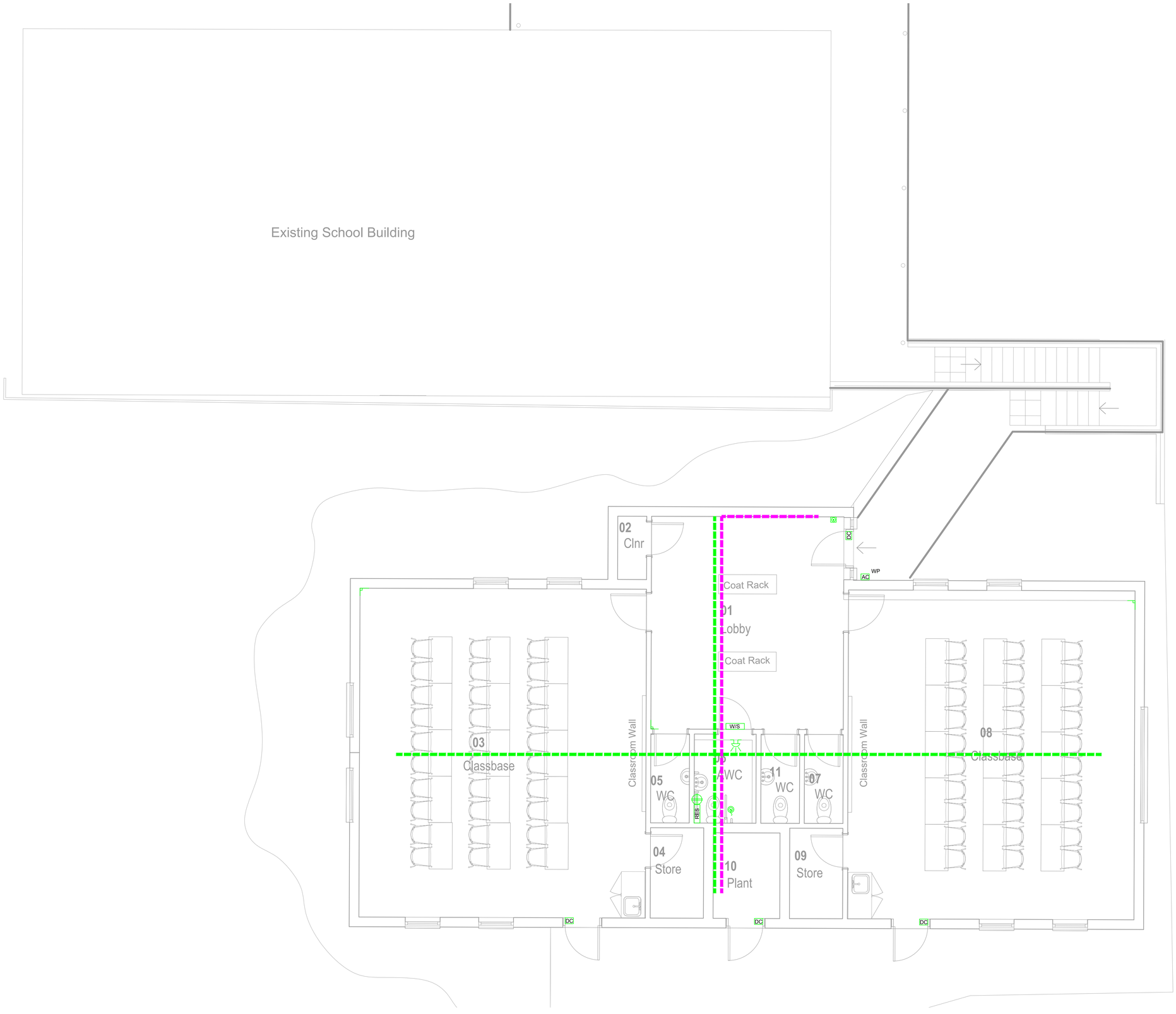

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6. ALL ELECTRICAL ITEMS SHALL BE INSTALLED AND TESTED I ACCORDANCE WITH BS7671 18TH.
7. ALL EARTHING SHALL BE IN ACCORDANCE WITH BS7671 18TH.
8. ALL CONTAINMENT SHALL BE INSTALLED IN ACCORDANCE WITH BS 7671 18TH.
9. 300MM CABLE BASKET SHALL BE INSTALLED AS SHOWN TO ACCOMMODATE ALL CABLING ABOVE CEILING.
10. CONDUIT SHALL BE INSTALLED FROM THE MAIN BASKET RUNS TO EACH POINT OF UTILISATION.
11. EARTHING SHALL BE PROVIDED FOR ALL METAL CONTAINMENT AND EARTH CONTINUITY INSURED THROUGHOUT ALL METAL CONTAINMENT JOINTS.
12. 50mm MINIMUM SPACING BETWEEN POWER, DATA & FIRE ALARM CABLES TO BE MAINTAINED THROUGHOUT CONTAINMENT.

LEGEND

SECURITY & ACCESS SYSTEMS

- KP — KEY PAD
- DC — DOOR CONTACT
- PIR SENSOR
- AC — ACCESS CARD/FOB READER ON-LINE
- EMERGENCY GREEN BREAK GLASS UNIT
- PUSH TO EXIT BUTTON

ASSESSABLE ALARM SYSTEM

- CALL POINT C/W CEILING PULL CORD
- W/S — WARNING LAMP AND SOUNDER
- CEILING MOUNTED REASSURANCE LAMP
- RES — RESET UNIT C/W REPEAT LAMP
- 300mm CABLE BASKET ZINC PLATED LV/ELV/FA
- 200mm GALVANISED STEEL CABLE TRAY

ABBREVIATIONS

WP WEATHERPROOF

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New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Electrical Services
Ground Floor Auxilliary and Containment Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: LM	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-E(61/54)100

Rev: T0

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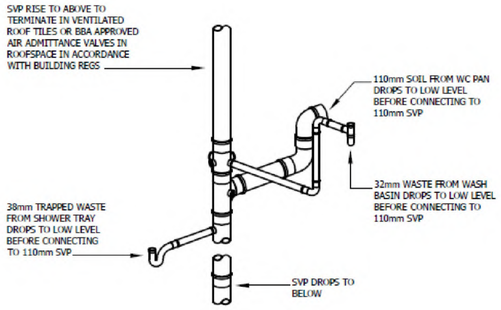

ABOVE GROUND DRAINAGE 'TYPICAL' DETAIL
SCALE: N.T.S

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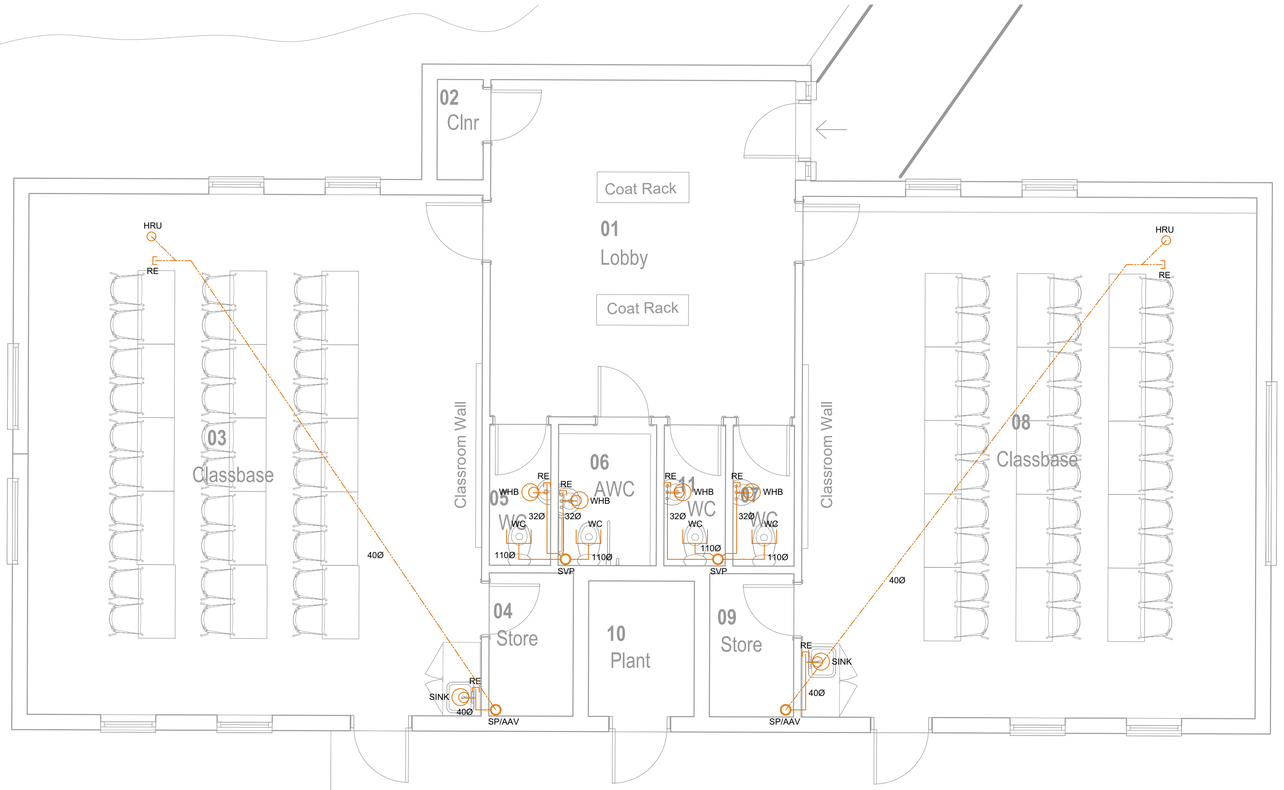
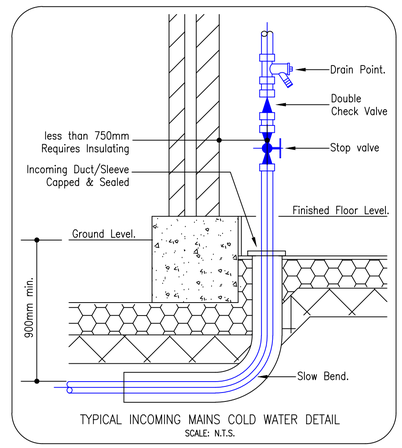
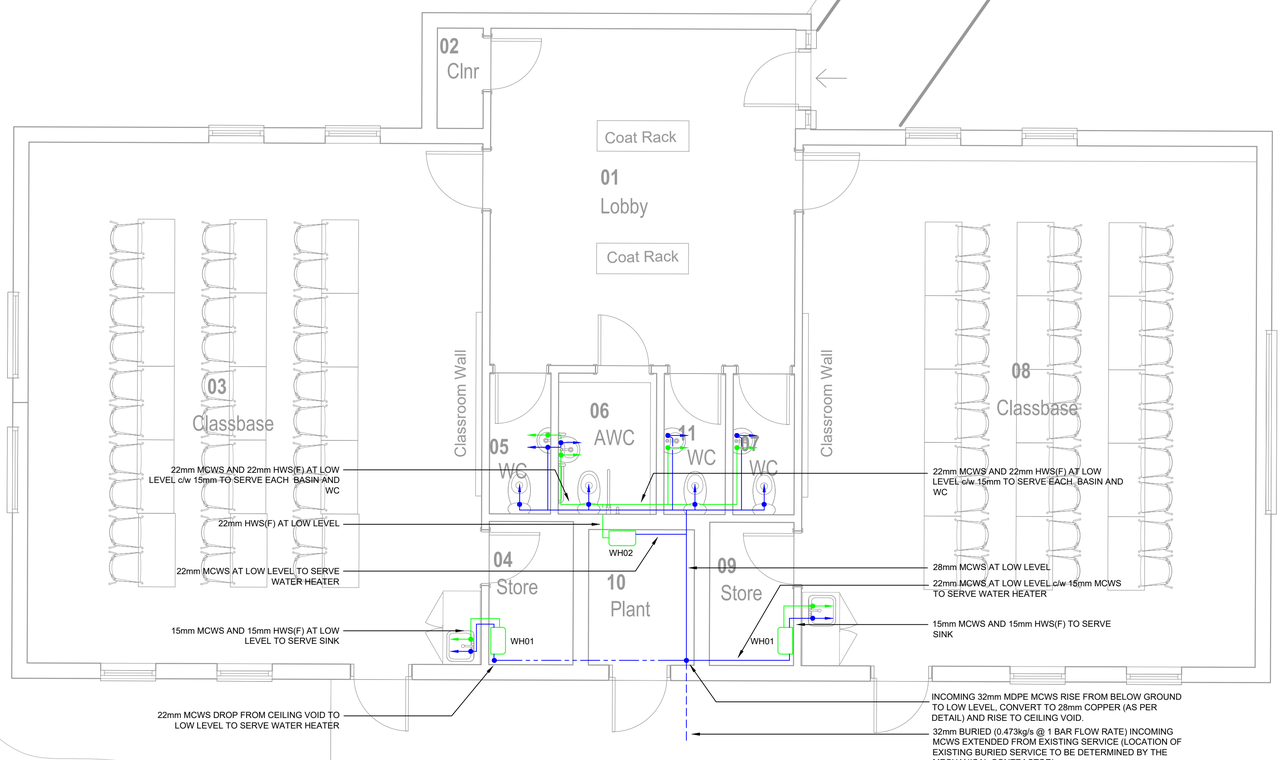
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT MECHANICAL SERVICES PLANT SCHEDULES.
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL CONSULTANTS, SUB-CONSULTANTS AND ARCHITECTS PROJECT DRAWINGS.
5. ALL TESTING AND COMMISSIONING SHALL BE IN ACCORDANCE WITH THE CIBSE GUIDES, TECHNICAL MEMORANDA, COMMISSIONING CODES AND MANUFACTURES RECOMMENDATIONS.
6. ALL ABOVE GROUND DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH BS EN 12056 REGULATIONS. ALL ACCESS POINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REGULATIONS TO ALLOW SUITABLE CLEANING ETC.
7. ALL ABOVE SOIL & WASTE PIPEWORK AND FITTINGS SHALL BE OF ONE MANUFACTURER AND SHALL BE INSTALLED ENTIRELY IN ACCORDANCE WITH THEIR RECOMMENDATIONS.
8. ALL TRAPS ARE TO INCORPORATE A 75mm WATER SEAL. WASH HAND BASINS REQUIRE A 32mmØ TRAP.
9. All 110mmØ SOIL AND VENT SYSTEMS ARE TO UTILISE MATERIALS COMPLYING WITH BS 4514:2001.
10. THE SUPPLY AND INSTALLATION OF THE SOIL AND WASTE SYSTEMS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. INCLUDED SHALL BE OVERFLOWS FROM CISTERNS, BRANCHES TO ALL ITEMS OF SANITARY WARE AND MAIN SOIL AND VENT PIPES TOGETHER WITH THE NECESSARY CONNECTION TO THE BELOW GROUND DRAINAGE SYSTEM.
11. THE INSTALLATION OF THE BELOW GROUND DRAINAGE SYSTEMS NOT PART OF THIS CONTRACT.
12. POSSESSION AND INSTALLATION OF THE SANITARY WARE SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR ONCE HANDED OVER BY THE MAIN CONTRACTOR.
13. ALL INTERNAL VERTICAL SOIL STACKS AND S&VP's SHALL BE INSTALLED IN 19mm FOIL BACKED FIBRE GLASS INSULATION.
14. ACCESS COVERS AND CLEANING EYES TO BE PROVIDED WHERE NECESSARY TO PERMIT TESTING AND CLEANING OF PIPEWORK.
15. WATER TESTS TO BE APPLIED TO ALL SOIL AND WASTE SYSTEMS ABOVE GROUND LEVEL TO THE SATISFACTION OF THE BUILDING CONTROL OFFICER.
16. REFER TO THE CIVIL ENGINEERS DRAWINGS FOR BELOW GROUND DRAINAGE LAYOUTS.
17. ALL LOW LEVEL ABOVE GROUND DRAINAGE PIPEWORK TO BE BOXED IN BY MAIN CONTRACTOR.
18. FIRE STOPPING AND/OR FIRE COLLARS ARE NOT INDICATED FOR CLARITY, HOWEVER THESE SHALL BE INSTALLED WHERE ANY SERVICE PASSES THROUGH A FIRE BARRIER.
19. THE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE WATER SUPPLY (WATER FITTINGS) REGULATIONS 1999, ALL APPROPRIATE CODES OF PRACTICE, WATER AUTHORITY BYLAWS AND BRITISH STANDARDS WHERE THESE APPLY.
20. THE MECHANICAL CONTRACTOR SHALL PROVIDE AT ALL MAINS WATER SERVICE ENTRIES TO THE BUILDING(S), 1No. LABEL MARKED 'INCOMING WATER MAIN STOP VALVE', FIXED ADJACENT TO THE MAIN STOP VALVE WITH 4 BRASS CREWS.
21. DRAIN COCKS TO BE PROVIDED AT ALL LOW POINTS WHICH WILL NOT AUTOMATICALLY DRAIN THROUGH DRAW OFF POINTS, AIR VENTS AT ALL HIGH POINTS, PERMITTING SYSTEM AND PLANT TO BE EASILY AND FULLY DRAINED AND VENTED.
22. MAIN CONTRACTOR TO ENSURE SAFE ACCESS TO ALL VALVES, DRAIN VALVES, AAV's ETC.
23. THE MECHANICAL CONTRACTOR SHOULD NOTE THAT TO COMPLY WITH THE WATER SUPPLY (WATER FITTINGS) REGULATIONS 1999, CHECK VALVES MUST BE INSTALLED IN THE SUPPLY PIPE CONNECTION SERVING ALL EQUILIBRIUM BALL VALVES. THE VALVE SHALL BE INSTALLED BETWEEN THE EQUILIBRIUM BALL VALVE AND ISOLATING STOP VALVE AND MUST BE FITTED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. ALL OTHER APPLIANCES MUST BE FITTED WITH A 'BALLOFIX' TYPE ISOLATING VALVES.
24. ALL DISTRIBUTION PIPEWORK SHALL BE INSTALLED SO THAT HE RISE / FALL OF THE PIPEWORK PROVIDES NATURAL VENTING OF THE SYSTEM WHEN A "DRAW-OFF" OCCURS.
25. TEMPERATURE MIXING VALVES (TMV's) TYPE 3 SHALL BE INSTALLED ON ALL BASIN OUTLETS WHICH SHALL RESTRICT THE WATER TEMPERATURE TO 42°C .
26. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE ENTIRE PLUMBING EQUIPMENT AND SERVICE EXCEPT WHERE INDICATED.
27. ALL PIPEWORK SHALL BE PRESSURE TESTED TO TWICE WORKING PRESSURE IN ATTENDANCE OF THE CONSULTING ENGINEER.
28. ALL PIPEWORK SHALL BE FULLY DISINFECTED IN ACCORDANCE WITH BS EN 806 AND BUILDING CONTROL REQUIREMENTS.
29. ALL HOT, COLD AND MAINS WATER SERVICES PIPEWORK WITHIN JOIST SPACE, SERVICE DUCTS AND/OR CONCELED AREAS SHALL BE THERMALLY INSULATED.
30. IN ACCORDANCE WITH THE PROJECT SPECIFICATION OF WORKS. FOR CLARITY EXPANSION BELLOWS AND GUIDES ARE NOT SHOWN HOWEVER SHALL BE INSTALLED TO ACCOUNT FOR THE CHANGES IN WATER AMBIENT TEMPERATURE ETC.



ABOVE GROUND DRAINAGE LAYOUT
SCALE: 1:50



TYPICAL INCOMING MAINS COLD WATER DETAIL
SCALE: N.T.S.



DOMESTIC HOT AND COLD WATER SERVICES LAYOUT
SCALE: 1:50

FIRE PROTECTION NOTES

PASSIVE FIRE PROTECTION
ALL PASSIVE FIRE PROTECTION SHALL UNDERTAKEN USING MATERIALS AS SPECIFIED OR AN APPROVED LOSS PREVENTION CERTIFICATION BOARD SYSTEM & INSTALLED BY AN ACCREDITED INSTALLER. THE MAIN CONTRACTOR SHALL PROVIDE CERTIFICATION FOR THE SYSTEM USED & FOR THE INSTALLATION ON COMPLETION OF THE WORKS.

GENERAL FIRE GAP SEALING
INTUMESCENT SEALANT TO BE HILTI EXPANDING IRE SEAL CP600 FOR UP TO 120 MINUTE FIRE PROTECTION WITHIN WALLS AND 180 MINUTE FIRE PROTECTION WITHIN FLOORS.

SERVICES FIRE SLEEVES
PIPEWORK PASSING THROUGH FIRE COMPARTMENT WALLS MUST HAVE HILTI PIPE SLEEVES (SUITABLE FOR PIP SIZES 15 - 169mm) FOR UP TO 120 MINUTE FORE PROTECTION IN PARTITIONS. SLEEVES TO PLASTIC PIPES ARE TO BE CUT A MINIMUM OF 50mm LONGER THAN THE WALL WIDTH TO ALLOW 25mm PROJECTION EITHER SIDE OF THE WALL. SLEEVES TO BE NO BIGGER THAN 15mm AND TO BE FITTED WITH INTUMESCENT SEALANT. ALL INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

VENTILATION DUCTWORK PASSING THROUGH FIRE COMPARTMENT WALLS MUST HAVE HILTI VENT DUCT FIRE SLEEVES (SUITABLE FOR SIZES SEE MANUFACTURERS INFORMATION FOR CONFORMATION) FOR UP TO 120 MINUTE FORE PROTECTION IN PARTITIONS. SLEEVES ARE TO BE CUT A MINIMUM OF 50mm LONGER THAN THE WALL WIDTH TO ALLOW 25mm PROJECTION EITHER SIDE OF THE WALL. GAP BETWEEN PLASTERBOARD AND SLEEVES TO BE NO BIGGER THAN 5mm AND TO BE FILLED WITH INTUMESCENT SEALANT. ALL INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

SOIL AND VENT PIPES / PLASTIC VENTILATIO PIPES PASSING THROUGH FIRE COMPARTMENT FLOORS MUST HAVE HILTI FIRE COLLARS SECURELY FIXED TO UNDERSIDE OF THE FLOOR USING 75mm LONG SCREWS THROUGH PLASTERBOARD INTO PLY PATRESSE. ALL INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

LEGEND

BASIN	WASH HAND BASIN
WC	TOILET
SINK	SINK
RE	RODDING EYE
SVP	SOIL VENT PIPE
AAV	DURGO TYPE AIR VALVE
SP	SOIL PIPE
FG	FLOOR GULLY

PIPEWORK LEGEND

———	DENOTES PIPEWORK AT LOW LEVEL
- - - - - -	DENOTES PIPEWORK WITHIN FLOOR
—·—·—·—	DENOTES PIPEWORK WITHIN CEILING VOID/HIGH LEVEL

Date	Description	Rev	By
Sept 19	Clients Comments Incorporated and Issued for Tender	T0	SO

Revision Schedule

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W: www.oatwaydesign.co.uk
consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Mechanical Services
Ground Floor Above Ground Drainage and Domestic Hot and Cold Water Services Layout

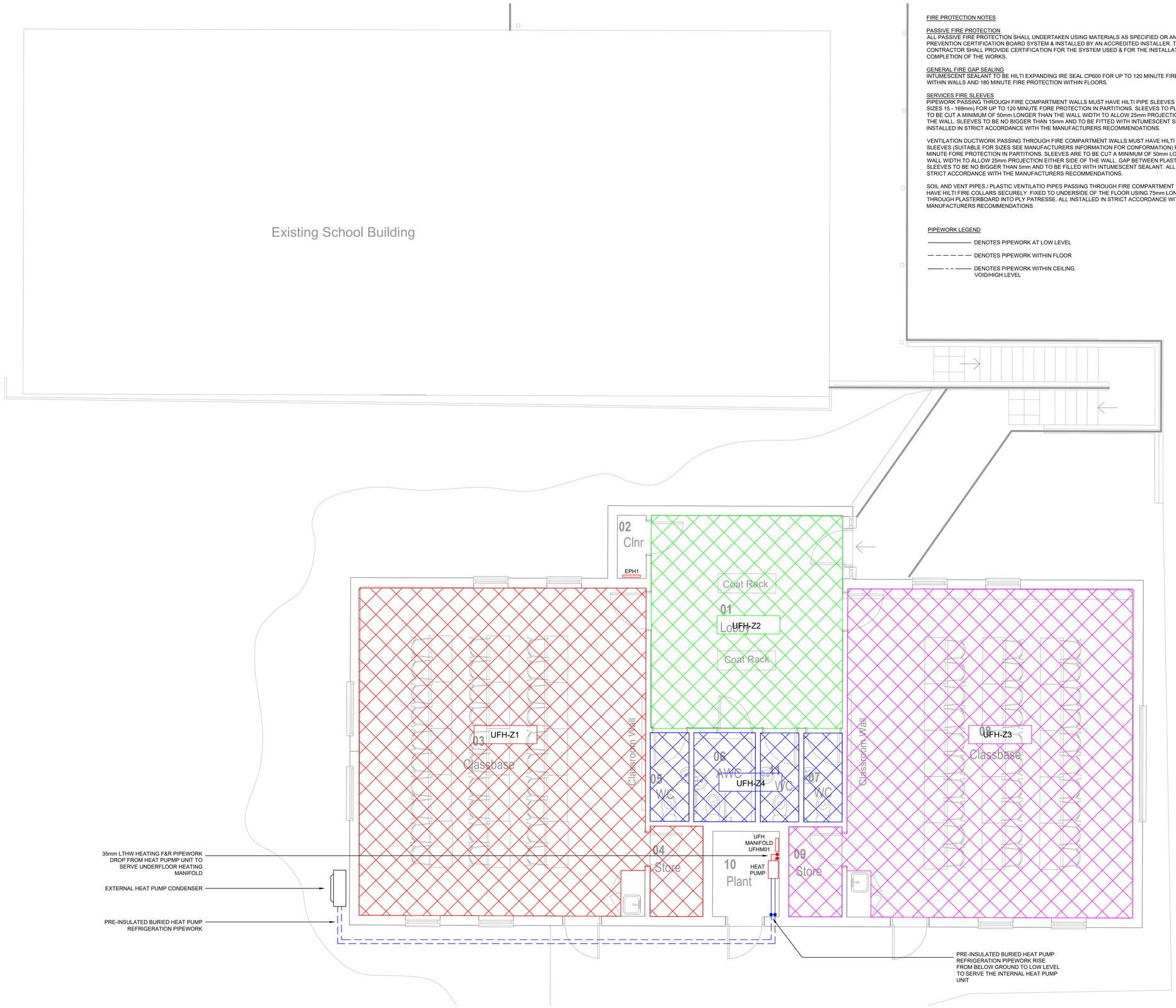
Drawing Status:

STAGE 4 - TENDER

Drawn: SO	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-M(52/53)100
Rev: T0

NOT FOR CONSTRUCTION



FIRE PROTECTION NOTES

PASSIVE FIRE PROTECTION
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GENERAL FIRE GAP SEALING
INTUMESCENT SEALANT TO BE HILTI EXPANDING IRE SEAL CP600 FOR UP TO 120 MINUTE FIRE PROTECTION WITHIN WALLS AND 180 MINUTE FIRE PROTECTION WITHIN FLOORS.

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SOIL AND VENT PIPES / PLASTIC VENTILATIO PIPES PASSING THROUGH FIRE COMPARTMENT FLOORS MUST HAVE HILTI FIRE COLLARS SECURELY FIXED TO UNDERSIDE OF THE FLOOR USING 75mm LONG SCREWS THROUGH PLASTERBOARD INTO PLY PATRESSE. ALL INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

PIPEWORK LEGEND

———————— DENOTES PIPEWORK AT LOW LEVEL

— – — – — DENOTES PIPEWORK WITHIN FLOOR

——— – – ——— DENOTES PIPEWORK WITHIN CEILING VOID/HIGH LEVEL

NOTES

1. THIS DRAWING IS NOT TO BE SCALED FROM.
2. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SERVICES PERFORMANCE SPECIFICATION OF WORKS.
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL CONSULTANTS, SUB-CONSULTANTS AND ARCHITECTS PROJECT DRAWINGS.
5. ALL TESTING AND COMMISSIONING SHALL BE IN ACCORDANCE WITH THE CIBSE GUIDES, TECHNICAL MEMORANDA, COMMISSIONING CODES AND MANUFACTURES RECOMMENDATIONS.
6. DRAIN COCKS TO BE PROVIDED AT ALL LOW POINTS WHICH WILL NOT AUTOMATICALLY DRAIN THROUGH DRAW OFF POINTS, AIR VENTS AT ALL HIGH POINTS, PERMITTING SYSTEM AND PLANT TO BE EASILY AND FULLY DRAINED AND VENTED.
7. ALL PIPEWORK SHALL BE PRESSURE TESTED TO TWICE WORKING PRESSURE IN ATTENDANCE OF THE CONSULTING ENGINEER.
8. MAIN CONTRACTOR TO ENSURE SAFE ACCESS TO ALL VALVES, DRAIN VALVES, AAV's ETC.
9. THE PIPEWORK SHALL BE INSTALLED WITH CORRECT FIXING AND FITTINGS TO ALLOW FOR EXPANSION AND MOVEMENT.
10. ALL CONCEALED PIPEWORK TO BE THERMALLY INSULATED AND VAPOR SEALED.
11. THE UNDERFLOOR HEATING SYSTEMS SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURERS INSTRUCTION AND RECOMMENDATIONS. ALL CORRESPONDING WALL CONTROLLERS SHALL BE POSITIONED TO BEST OPTIMISE THE UNDERFLOOR HEATING SYSTEM OPERATION.
12. FOR CLARITY EXPANSION BELLOWS AND GUIDES ARE NOT SHOWN HOWEVER SHALL BE INSTALLED TO ACCOUNT FOR THE CHANGES IN WATER AMBIENT TEMPERATURE ETC.
13. THE HEATING SYSTEM HAS BEEN DESIGNED WITH A ΔT OF 5°C (45°c FLOW AND 40°c RETURN TEMPERATURES)

LEGEND

UFH#	UNDERFLOOR HEATING ZONE
WM	WATER METER
DV	DRAIN VALVE
TP	TEST POINT
STR	STRAINER
LSV	LOCKSHEILD VALVE
EV	EXPANSION VESSEL
AAV	AUTOMATIC AIR VENT
CS#	COMMISSIONING STATION
SV	STOP VALVE
DOC	DRAIN OFF VALVE
IV	ISOLATION VALVE
NRV	NON-RETURN VALVE
DRV	DOUBLE REGULATING VALVE
DCV	DOUBLE CHECK VALVE

Date	Description	Rev	By
Sept 19	Clients Comments Incorporated and Issued for Tender	T0	SO

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consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Mechanical Services
Ground Floor Heating Services Layout

Drawing Status:

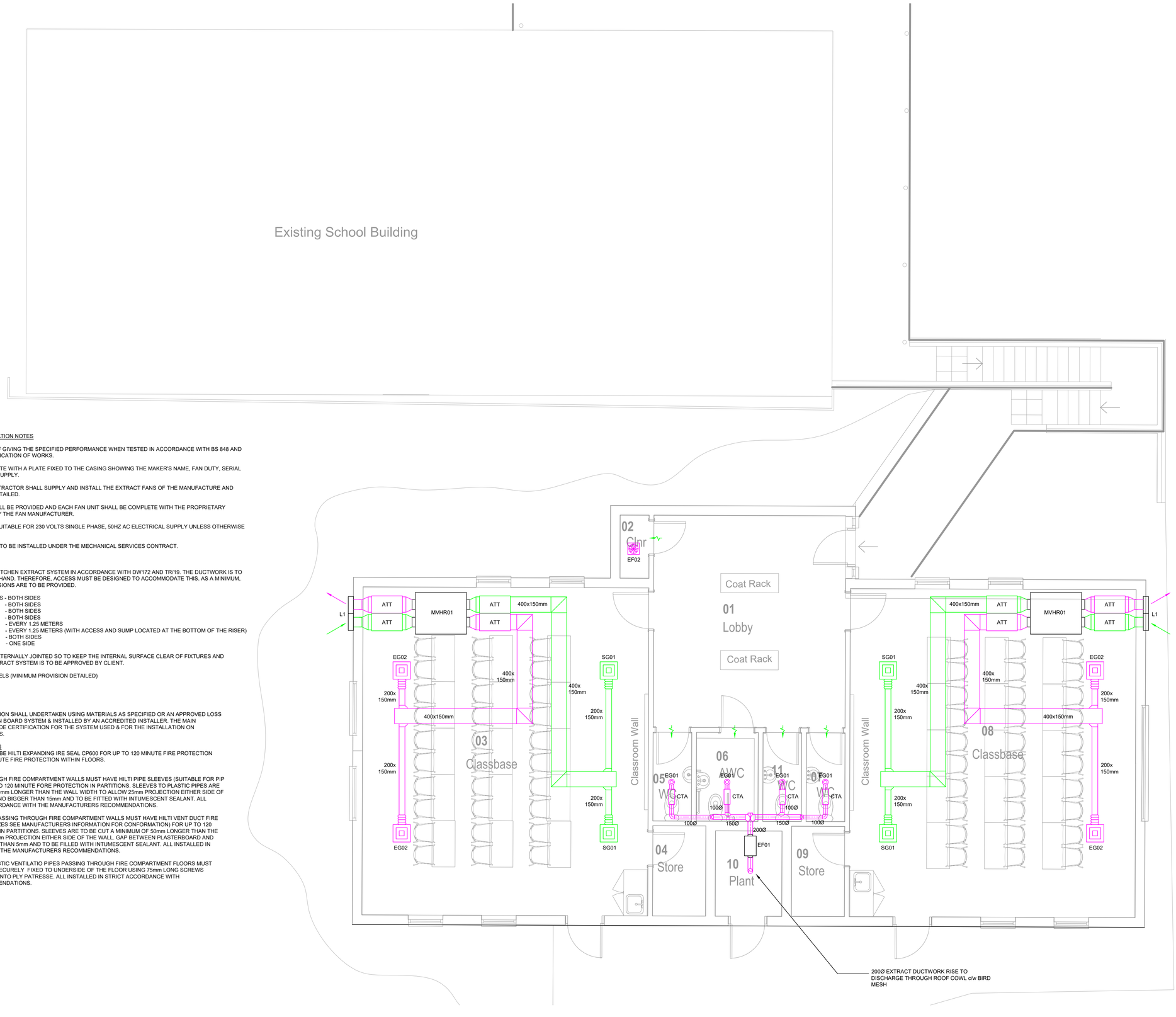
STAGE 4 - TENDER

Drawn: SO	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-M(56)100

Rev: T0

NOT FOR CONSTRUCTION



GENERAL EXTRACT VENTILATION NOTES

FANS SHALL BE CAPABLE OF GIVING THE SPECIFIED PERFORMANCE WHEN TESTED IN ACCORDANCE WITH BS 848 AND AS DETAILED IN THE SPECIFICATION OF WORKS.

EACH FAN IS TO BE COMPLETE WITH A PLATE FIXED TO THE CASING SHOWING THE MAKER'S NAME, FAN DUTY, SERIAL NUMBER AND ELECTRICAL SUPPLY.

THE MECHANICAL SUB CONTRACTOR SHALL SUPPLY AND INSTALL THE EXTRACT FANS OF THE MANUFACTURE AND TYPE AS INDICATED AND DETAILED.

AUTOMATIC SHUTTERS SHALL BE PROVIDED AND EACH FAN UNIT SHALL BE COMPLETE WITH THE PROPRIETARY CONTROL UNIT SUPPLIED BY THE FAN MANUFACTURER.

FANS SHALL BE SUPPLIED SUITABLE FOR 230 VOLTS SINGLE PHASE, 50HZ AC ELECTRICAL SUPPLY UNLESS OTHERWISE STATED.

ALL VENTILATION SYSTEMS TO BE INSTALLED UNDER THE MECHANICAL SERVICES CONTRACT.

ACCESS PROVISION

PROVIDE ACCESS TO ANY KITCHEN EXTRACT SYSTEM IN ACCORDANCE WITH DW172 AND TR/19. THE DUCTWORK IS TO BE MANUALLY CLEANED BY HAND. THEREFORE, ACCESS MUST BE DESIGNED TO ACCOMMODATE THIS. AS A MINIMUM, THE BELOW ACCESS PROVISIONS ARE TO BE PROVIDED.

VOLUME CONTROL DAMPERS	- BOTH SIDES
FIRE DAMPERS	- BOTH SIDES
ATTENUATORS	- BOTH SIDES
CHANGE IN DIRECTION	- BOTH SIDES
HORIZONTAL RUNS	- EVERY 1.25 METERS
VERTICAL RISERS	- EVERY 1.25 METERS (WITH ACCESS AND SUMP LOCATED AT THE BOTTOM OF THE RISER)
EXTRACT FANS	- BOTH SIDES
DISCHARGE GRILLE/MESH	- ONE SIDE

ALL DUCTWORK IS TO BE EXTERNALLY JOINTED SO TO KEEP THE INTERNAL SURFACE CLEAR OF FIXTURES AND FITTINGS. THE KITCHEN EXTRACT SYSTEM IS TO BE APPROVED BY CLIENT.

AP - DENOTES ACCESS PANELS (MINIMUM PROVISION DETAILED)

FIRE PROTECTION NOTES

PASSIVE FIRE PROTECTION
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INTUMESCENT SEALANT TO BE HILTI EXPANDING IRE SEAL CP600 FOR UP TO 120 MINUTE FIRE PROTECTION WITHIN WALLS AND 180 MINUTE FIRE PROTECTION WITHIN FLOORS.

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SOIL AND VENT PIPES / PLASTIC VENTILATIO PIPES PASSING THROUGH FIRE COMPARTMENT FLOORS MUST HAVE HILTI FIRE COLLARS SECURELY FIXED TO UNDERSIDE OF THE FLOOR USING 75mm LONG SCREWS THROUGH PLASTERBOARD INTO PLY PATRESSE. ALL INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

NOTES

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4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL CONSULTANTS, SUB-CONSULTANTS AND ARCHITECTS PROJECT DRAWINGS.
5. ALL TESTING AND COMMISSIONING SHALL BE IN ACCORDANCE WITH THE CIBSE GUIDES, TECHNICAL MEMORANDA, COMMISSIONING CODES AND MANUFACTURES RECOMMENDATIONS.
6. ALL VENTILATION FANS SHALL BE CAPABLE OF GIVING THE SPECIFIED PERFORMANCE WHEN TESTED IN ACCORDANCE WITH BS 848 AND AS DETAILED IN THE PROJECT SPECIFICATION OF WORKS DOCUMENT.
7. EACH VENTILATION FAN IS TO BE COMPLETE WITH A PLATE FIXED TO THE CASING SHOWING THE MAKER'S NAME, FAN DUTY, SERIAL NUMBER AND ELECTRICAL SUPPLY.
8. THE MECHANICAL SUB-CONTRACTOR SHALL SUPPLY AND INSTALL ALL VENTILATION FANS OF THE MANUFACTURER AND TYPE AS INDICATED AND/OR AD DETAILED WITHIN THE PROJECT SPECIFICATION OF WORKS DOCUMENT.
9. AUTOMATIC SHUTTERS SHALL BE PROVIDED AND EACH FAN UNIT SHALL BE COMPLETE WITH THE PROPRIETARY CONTROL UNIT SUPPLIED BY THE VENTILATION FAN MANUFACTURER.
10. VENTILATION FANS SHALL BE SUPPLIED SUITABLE FOR 230 VOLTS SINGLE PHASE, 0HZ AC ELECTRICAL SUPPLY UNLESS OTHERWISE STATED.
11. THE VENTILATION SYSTEM AS A WHOLE IS TO BE INSTALLED UNDER THE MECHANICAL CONTRACTORS CONTRACT.
12. THE MECHANICAL/DUCTWORK INSTALLATION MUST BE CARRIED OUT IN COMPLIANCE WITH THE HVCA DW144/DW154 AND ALL SUBSEQUENT REVISIONS/EDITIONS, CURRENT BUILDING REGULATIONS, BRITISH STANDARDS AND GOOD PRACTICE.
13. ALL VENTILATION AIR INTAKE AND EXHAUST EXTERNAL LOUVRES/COWLS/TERMINALS TO BE A MINIMUM OF 2m BETWEEN EACH TERMINAL.
14. ALL AIR INTAKE AND EXHAUST VENTILATION DUCTWORK SERVING ANY HRU SHALL BE THERMALLY INSULATED IN ACCORDANCE WITH THE PROJECT SPECIFICATION OF WORKS.
15. FOR CLARITY VENTILATION ATTENUATION IS NOT INDICATED. HOWEVER, INLINE DUCT ATTENUATION IS REQUIRED ON THE INTAKE/EXHAUST AND SUPPLY/EXTRACT VENTILATION SYSTEM TO/FROM THE HEAT RECOVERY UNIT.

LEGEND

VCD	VENTILATION VOLUME CONTROL DAMPER
HRU	VENTILATION HEAT RECOVERY UNIT
EL	VENTILATION EXTERNAL LOUVRE c/w BIRD MESH
EG	VENTILATION EXTRACT AIR GRILLE/VALVE
SG	VENTILATION SUPPLY AIR GRILLE/VALVE
EF	VENTILATION EXTRACT FAN
FD	FIRE DAMPER
CTA	CROSS TALK ATTENUATOR
	DENOTES UNDERCUT DOOR FOR NATURAL SUPPLY AIR

Date	Description	Rev	By
Sept 19	Clients Comments Incorporated and Issued for Tender	T0	SO

Revision Schedule

Oatway Design Ltd
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W: www.oatwaydesign.co.uk
consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Mechanical Services
Ground Floor Ventilation Services Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: SO	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:50 @ A1	Date: August 2019

Drawing Number: P1208-M(57)100

Rev: T0

NOT FOR CONSTRUCTION

Contractors/Sub-Consultants must check all dimensions on site. Only figure dimensions are to be used. Any discrepancies to be reported to Oatway Design Ltd prior to commencing any works. This drawing shall be used for the purpose intended only.

NOTES

1. THIS DRAWING IS NOT TO BE SCALED FROM.
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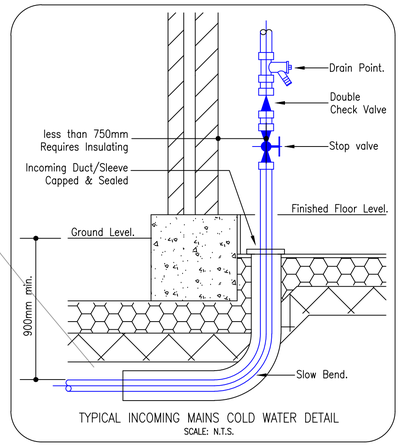
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT ELECTRICAL SERVICES SCHEDULES.
4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL CONSULTANTS, SUB-CONSULTANTS AND ARCHITECTS PROJECT DRAWINGS.
5. NEW ELECTRICAL SUB MAIN SUPPLY CABLE IS TO BE FIXED ABOVE CEILING WHERE IT ROUTES THROUGH THE INSIDE OF THE EXITING BUILDING(S).
6. WHERE THE ELECTRICAL SUB MAIN SUPPLY CABLE IS ROUTED EXTERNAL TO THE EXISTING BUILDING(S) IT SHALL BE BURRIED WITHIN A DUCT AND CONFORM TO THE REQUIREMENTS OF BS 7671 2018.



TYPICAL INCOMING MAINS COLD WATER DETAIL
SCALE: N.T.S.

MAIN BUILDING

Trewirgie Junior School

ELECTRICAL SERVICES CABLE DROP TO EXISTING DISTRIBUTION BOARD DB1

ELECTRICAL SERVICES CABLE SUSPENDED AT HIGH LEVEL PRIOR TO ENTRY INTO CLASSROOM BLOCK

ELECTRICAL CABLE ROUTE INTO PLANT ROOM VIA HIGH LEVEL GALVANISED STEEL CABLE TRAY SUPPORTED THROUGH PROPOSED CLASSROOM BLOCK.

MCWS RISE FROM BELOW GROUND WITHIN PLANT ROOM. REFER TO TYPICAL DETAIL

MCWS CONNECT INTO EXISTING BURIED SERVICES BELOW GROUND. EXACT LOCATION OF EXISTING SERVICE TBC BY CONTRACTOR. CONTRACTOR TO RECORD AND SUBMIT THE EXISTING WATER FLOW RATE AND PRESSURE PRIOR ANY WORKS

Date	Description	Rev	By
Sept 19	Clients Comments Incorporated and Issued for Tender	T0	SO

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consulting engineers
'The Heart of the Building'

Project Title:

New Classroom Block
Trewirgie Junior School, Cornwall

Drawing Title:

Mechanical and Electricall Services
External Services Layout

Drawing Status:

STAGE 4 - TENDER

Drawn: LM	Checked: SO
Base: V1-00-PL-A-1100	Project: P1208
Scale: 1:100 @ A1	Date: August 2019

Drawing Number: P1208-ME(50)100

Rev: T0

Project Designer Risk Assesment

Project Address: Trewirgie Junior School, Redruth, Cornwall

Project Reference: P1208

Designer: S Oatway / L Morgan

Project Title: New Classroom Block

Telephone No: 01752 569365

Email: office@oatwaydesign.co.uk

OATWAY design consulting engineers

Ref	Element	Specific Hazards	Who is at Risk?	Implication	Risk Assesment Prior to Control Measure		Control Methods / Details of Residual Hazards	Risk Assesment After Control Measure	
					Severity	Probability		Severity	Probability
A	**Site Implications**								
1	Occupied Site	Conflict between construction works and school activities	School occupants	Injuries to pupils, staff and public	5	5	Undertaking project during holiday periods and/or utilising appropriate means of segregation if the works must take place whilst the School is in occupation.	5	2
2	Access	Movement of vehicles	School occupants	Injuries to pupils, staff and public	5	4	Deliveries and contractors vehicular movements are to be restricted to scheduled times to be agreed with the School and Contract Administrator	5	2
3	Welfare Facilities	Contractor has no facilities	Contractor	Illegal and unsafe working environment	3	3	Appropriate welfare facilities to be provided within the Contractors compound	3	1
4									
5									
B	**Demolitions/Removals**								
1	Asbestos	Uncontrolled release of asbestos fibres	Contractor, School occupants	Serious long term health consequences	5	3	A full HSG264 Refurbishment and Demolition Survey has been commissioned the results from this survey are awaited. An Asbestos Management Plan has been completed and is included within the tender package. The Asbestos Management Plan makes no reference to Asbestos Containing Materials (ACM's) being identified in the Work area, however a provisional sum has been included for works associated with ACMs. **OR** An HSG264 Refurbishment and Demolition Survey has been completed and the survey report is included within the tender package. The Contractor is to allow for the works to be planned and undertaken in a manner which prevents all identified ACMs from being disturbed, including but not limited to any means of protection (i.e. PPE and/or segregate hoarding/barriers) or access equipment to facilitate the works being undertaken in a safe and	5	1
2	Working at Height	Risk of falling	Contractor/Sub-Contractors	Injury of death	5	4	Suitable access, scaffolding and edge protection shall be provided	5	2
3	Manual Handling	Use of heavy equipment/plant	Contractor	Personal Injury	4	2	Operatives to be suitably trained. Contractor to provide appropriate lifting equipment where necessary.	4	1
4	Manual Handling	Heavy Materials	Contractor	Personal Injury	4	2	Operatives to be suitably trained. Contractor to provide appropriate lifting equipment where necessary.	4	1
5									
C	**Electrical Services**								
1	Existing Electrical Services	Works damaging existing services	Contractor	Electrocution	5	3	Competent contrctors to be engauged for the isolation and reinstatement of the existing services as required to facilitate the proposed works	5	1
2	Electrical Works	Fire	Contractor/Occupants	Electrocution	5	3	Competent contractor/engineer registered with the NICEIC shall install, test and certificate the installation to ensure compliance and suitability of the system	5	1
D	**Mechanical Services**								
1	Existing Mechanical Services	Works damaging existing services	Contractor	Possible injury or infection	4	3	Competent contractors to be engaged for the isolation and reinstatement of the existing services as required to facilitate the proposed works	4	1
2	Mechanical Works	Fire	Contractor	Injury Death	5	4	The Contractor shall provide a hot works permit when carrying out any hot works during the contact. All hot works must be completed at least 30mins prior to leaving site with a complete check of the area carried out once the 30mins have passed	5	2
3	Mechanical Works	Carbon Monoxide Posioning	Contractor/Occupants	Possible infection or death	5	4	In compliance with the Gas Safe regulations the competent contractor shall ensure adequate boiler room ventilation which shall be provided via the boiler room louvred doors (high level) and new low level ventilation	4	2

Appendix K. Underfloor Heating Specification

Nu-Heat
UNDERFLOOR & RENEWABLES

UNDERFLOOR HEATING · HEAT PUMPS · SOLAR THERMAL

Quote details

Air Source Heat Pump: Quotation

Customer number:	NS35922:14 Faithful & Gould : Faithful & Gould - Exeter
Site address:	Trewirgie Junior School, Falmouth Road, Redruth, TR15 2QN
Quotation number:	HP40783
Quotation date:	22/8/2019
Account Manager:	James.Davies@nu-heat.co.uk **Tel:** null

NIBE F2040 Air Source Heat Pump with Nu-Heat hot water cylinder, buffer tank and supplementary electric heating

For detailed product information and specification click here.

Why choose a NIBE Air Source Heat Pump

- Quiet operation
- Improved energy efficiency
- MCS approved offering access to the RHI
- Supplied with a full set of mechanical and electrical docking drawings
- Remote monitoring and adjustment of the system with NIBE Uplink - read more
- Easy installation thanks to simple wiring, adjustable feet and long hoses
- 7 year warranty when supplied and commissioned by Nu-Heat

Find out more about our high performance heat pumps.

Your system price - What's included?

Qty	Item Description
1	NIBE F2040-8 (typically capable of heating a property with 7kW heat loss at design operating conditions, in compliance with MCS standards) air source heat pump kit, charge pump, and associated fittings.
1	Docking assembly for air source heat pump with Nu-Heat hot water cylinder, buffer tank and supplementary electric heating
1	EnergyPro® 300 litre unvented stainless steel HP cylinder for use with NIBE ASHP, including fittings and G3 kit. (Please note that the cylinder warranty does not cover private water supplies, e.g. boreholes. Please speak to your Account Manager if this required.)
1	100 litre (stackable type C) buffer tank assembly with four tappings and one immersion tapping, with immersion heater
1	Electric metering kit for one single phase heat pump and two additional immersion heaters
1	Includes delivery of heat pump and tank by carrier to UK mainland only
1	Please select the relevant on-site support option, as listed below.

Renewable Heat Incentive Payments

The Renewable Heat Incentive (RHI) is a tariff based* scheme offering regular payments to qualifying homeowners. It helps offset the cost of installing a renewable technology.

The potential payment shown here is for illustrative purposes only, based on the assumptions below:

- Tariff of 10.49p/kWh*
- Annual Heat Load of 15,000kWh
- Seasonal Performance Factor (SPF) of 2.7

An estimated annual heat load specific to this project can be found under the System Performance section.

For further information on the RHI scheme read our RHI factsheet.

*Tariffs are subject to change

Your quote price

A++ Total: £7239.0 + VAT

Energy efficiency ratings

As part of the Energy Related Products Directive, or ErP, all new heating system packages must come with an energy rating and label.

The flame icon represents the energy efficiency rating for the heating element of the system from A++ - G. A tap icon represents the energy efficiency rating for the hot water element of the system from A++ - G, where applicable.

The system fiche shows how the energy rating(s) for the system have been calculated.

View your system package energy efficiency label

VAT charges

VAT on renewables systems commissioned by Nu-Heat will be charged at 0% for new build projects and 5% for renovation projects.

VAT on renewables systems not commissioned by Nu-Heat will be charged at 20%.

Support Package Option(s)

The following support package option(s) are available with this quote.

Support Option	Price
SUPPAK N1(NB)HP Heat pump system design and supply (which must be invoiced to the Homeowner), with a comprehensive Nu-heat MCS Customer Handover Pack, free Technical Support and one on-site commissioning visit by a Nu-Heat Engineer. The visit will include the system handover, MCS administration and certification, and warranty activation. Following successful commissioning, Nu-Heat will provide MCS documentation to support eligible customers in obtaining relevant Government funding through DECC. The heat pump installation shall be managed by a formal Subcontract Agreement with the customer's own plumber and electrician for their respective works. Installers of the system shall sign and return Nu-Heat's Sub-Contract Agreement before any installation work commences, and adhere to the MCS and RECC standards. MCS Certification will be produced by Nu-Heat.	£600.00

Important

This quotation may be subject to revision at design stage when a more in-depth heat loss calculation and energy simulation will be performed. This can occasionally require that a different sized heat pump or ground loop array is required (if applicable) or a different heat pump (larger or smaller) is required. A change of this nature may require the system to be re-priced.

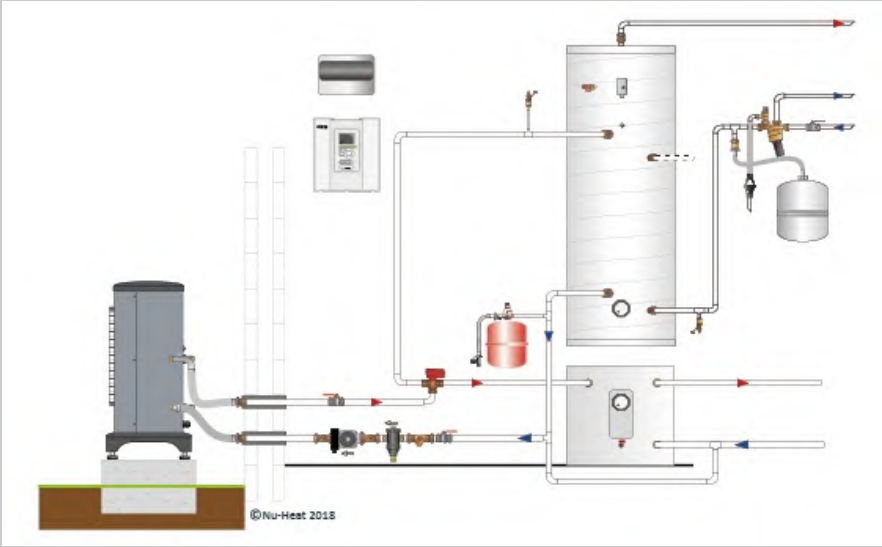
This quotation is subject to our terms and conditions.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

System Performance

The proposed system consists of a single NIBE air source heat pump and specialist hot water cylinder. A fully detailed mechanical and electrical plan will be provided at design stage.



Nu-Heat's heat pump sizing method follows the Microgeneration Certification Scheme's guideline, MIS3005. This is to ensure that the heat pump covers at least 100% of the building heat load for 99% of the average year. For this property, MIS 3005 determines a target outside air temperature of -0.2°C, where the heat pump must provide all of the space heating without any direct electrical backup. We calculate the building heat load at -0.2°C outside, and 20°C average inside to be 6.4kW based on building fabric insulation details supplied to us.

This quotation may be subject to revision at design stage when a more in-depth heat loss calculation and energy simulation will be performed. This can occasionally require that a different heat pump (larger or smaller) is required. A change of this nature may require the system to be re-priced.

In order to achieve permitted development status in England and Wales the installation must comply with the MCS020 standard, which requires a noise limit below 42 dB(A). It is the responsibility of the MCS Approved installer to confirm compliance with MCS020. Where this is Nu-Heat you will be contacted by one of our design engineers for information that will enable us to carry out the calculation.

A copy of the calculation will be inserted into the Commissioning & Warranty Documents section of Nu-Heat's MCS Handover Pack as proof of compliance.

Heating SCoP:	3.56	Based on regional weather data in line with MIS 3005
Hot water SCoP:	3.29	
Total building heat requirement:	20581.0	kWh based on: 172 m²
Heat output by heat pump:	26531.0	kWh for heating and hot water
Electricity required to power heat pump:	6657.0	kWh
Backup electricity:	159	kWh

Free energy from Heat Pump:		19874.0	kWh
Hot water cylinder re-heat time:		198 318	minutes (typical) minutes (max)
Heat Pump MCS Certificate No.	MCS HP0003/38		

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Upgrade Options

It's quick and easy to upgrade to any of the options shown below. Please contact me on James.Davies@nu-heat.co.uk or null and I will update your quote immediately.

Options

Code	Item Description	Price
HWL-A-A	Domestic hot water loop for use with Nu-Heat's EnergyPro HP cylinders and NIBE F2040 heat pump.	£189.40
IPEX32PD/10-A	10m Pre-insulated, flexible, flow and return pipe (DN25) for installation underground with heat pump connectors	£439.00

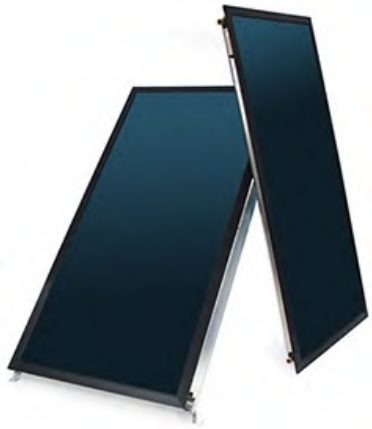
Please note: Upgrade Option prices valid until point of delivery.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Solar Thermal Hot Water **Upgrade**

Capture free solar energy and use it to heat domestic hot water with Nu-Heat's EnergyPro® solar thermal panels.



- Produces up to 60% of annual hot water demand, up to 100% in the summer months
- Quick and easy to install
- MCS approved
- Eligible for RHI grant - up to £1,795 over 7 years

2 panel Solar Thermal In Roof systems start from £1,900 +VAT. Speak to your Account Manager for a quotation.

Considering solar in the future?

Future proof your home with an EnergyPro® cylinder, featuring a second coil which is ready to be linked to a solar collector system.

- 25 year warranty
- Lightweight all-stainless-steel construction
- Supplied complete with connection fittings and G3 equipment
- Connection positions at front of the unit for simple installation, easy access and minimal space requirements
- Starting from £939+VAT

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Help with MCS compliance

Not MCS accredited? You can still install renewables systems that qualify for the Domestic RHI scheme by choosing a Nu-Heat MCS support package.

We will complete all of the paperwork, conduct on-site commissioning to ensure that system installed complies with strict MCS standards and issue your customer with their MCS certificate, required to access the RHI tariff payments.

Our comprehensive MCS support package includes:

✔ A complete MCS compliant documentation pack with mechanical and electrical design drawings, heat loss and heat pump sizing calculations, user manuals and more

✔ On-site system commissioning by an MCS-approved Nu-Heat engineer

✔ On-site and telephone support

Ask your Account Manager for more information on MCS support options.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

RECC - consumer protection you can trust

Nu-Heat is a member of the Renewable Energy Consumer Code, RECC. This gives you and your customer reassurance that we will always provide:

RECC
RENEWABLE ENERGY CONSUMER CODE

✔ Realistic performance information and predications

✔ Accurate quotations

✔ Information on any warranties and grants

✔ Installation and commissioning instructions and maintenance and service options

✔ The right to cancel once you have placed your order. You will need to do this in writing and can use our cancellation form. For full details please see our terms and conditions.

For more details, visit RECC.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Energy Label & Fiche

System Fiche

The package fiche below shows calculations of efficiency for the system as a whole, as required by EU legislation for energy related products.

Figure 3

For preferential heat pump space heaters and preferential heat pump combination heaters, element of the fiche for a package of space heater, temperature control and solar device and a package of combination heater, temperature control and solar device, respectively, indicating the seasonal space heating energy efficiency of the package offered

SEASONAL SPACE HEATING ENERGY EFFICIENCY OF HEAT PUMP		127 %
TEMPERATURE CONTROL	+	1.5 %
SUPPLEMENTARY BOILER		
(**N/A %** - **127 %**) x **0** =	-	0 %
SOLAR CONTRIBUTION		
(**N/A %** x **N/A** m² + **N/A** x **N/A** m³) x 0.45 x (**N/A %**/100) x **N/A** =	+	0 %
SEASONAL SPACE HEATING ENERGY EFFICIENCY OF PACKAGE UNDER AVERAGE CLIMATE		129 %

SEASONAL SPACE HEATING ENERGY EFFICIENCY CLASS OF PACKAGE UNDER AVERAGE CLIMATE

☐ G	☐ F	☐ E	☐ D	☐ C	☐ B	☐ A	☐ A+	☑ A++	☐ A+++
<30%	≥30%	≥34%	≥36%	≥75%	≥82%	≥90%	≥98%	≥125%	≥150%

SEASONAL SPACE HEATING ENERGY EFFICIENCY UNDER COLDER & WARMER CLIMATE CONDITIONS

Colder: **129 %** - **19** =	110 %	Warmer: **129 %** + **53** =	182 %

The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as the efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

The product fiche below shows technical information related to the product's efficiency, as required by EU legislation for energy related products.

Product Fiche

SUPPLIER	Nu-Heat UK Ltd
MODEL IDENTIFIER	ENHP300-A

ENERGY EFFICIENCY CLASS	C
STANDING LOSS	92 W
STORAGE VOLUME	290 l

Product Fiche

SUPPLIER	Nu-Heat UK Ltd
MODEL IDENTIFIER	HPBT100/C-A
ENERGY EFFICIENCY CLASS	C
STANDING LOSS	69 W
STORAGE VOLUME	100 l

Energy Labels

ENHP300-A	Click to view label [PDF]
HPBT100/C-A	Click to view label [PDF]

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Notes

The notes below are important information for you to understand in relation to this system. If you have any questions please feel free to contact me on James.Davies@nu-heat.co.uk or null for further information.

For Information

Service and warranty

The NIBE heat pump requires minimal maintenance but to ensure the continued efficient running of your heat pump and guarantee in the warranty period it is recommended that it is checked and serviced annually by a qualified engineer.

Positioning the air source heat pump

Air source heat pumps should be positioned such that airflow to and from the machine is unrestricted. The local authority should also be contacted to determine if planning permission is required for the unit's intended site.

Please Check

Does the size of the hot water cylinder meet requirements?

Every effort has been made to specify the most appropriate hot water cylinder for the property but we would ask you to check that the storage volume is sufficient. Please refer to our Heat Pump brochure for more details.

Don't forget ErP!

From 26th September 2015 all installers must calculate an energy efficiency rating for any new heating system package installed e.g. a boiler with thermostats. It's easy to do this yourself. Visit our ErP page here to watch the video and download our calculation forms.

Quote details

The Next Step

What's Next?

How to order

To place your order, discuss your quote, add extras or make any other changes, please contact me on:

null or email James.Davies@nu-heat.co.uk

Design

On confirming your order, Nu-Heat will complete a thorough design process resulting in detailed CAD layouts, manifold locations and wiring diagrams. In busy periods, our design process can take up to three weeks, although we always do our best to design systems as quickly as possible. Please contact us in good time to ensure that we can meet your project deadlines.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Terms and Conditions

NU-HEAT UK LIMITED
Company No. 3131852

1. DEFINITION "The Company" means Nu-Heat U.K. Limited of Heathpark House, Devonshire Road, Heathpark Industrial Estate, Honiton, Devon EX14 1SD. "The Conditions" means the standard conditions of sale set out in this document and (unless the context otherwise requires) includes any special terms agreed in Writing between the Company and the Customer. "The Contract" means the contract for the sale and purchase of the Goods and/or Services. "The Customer" means any person contracting with the Company. "Services" means any service which the company is to provide in accordance with these Conditions. "The Goods" means the Goods (including any instalment of the goods or any parts for them) which the Company is to supply in accordance with these Conditions. "Writing" and any similar expression, includes a facsimile transmission, email, and other comparable means of communication.

2. APPLICATION

(a). THE Company's Conditions are set out below to the exclusion of all other conditions, and shall be incorporated in every offer, quotation, acceptance and the Contract for the sale or supply of Goods or services by the Company. No addition to, or variation of these Conditions will bind the Company unless it is specifically agreed in writing and signed by a Director of the Company. No agent or person employed by, or under contract with the Company has any authority to alter or vary in any way these Conditions except as stated above.

(b). IF these Conditions are so varied then, subject to the express terms of that variation, these Conditions shall continue to apply as if that variation were incorporated in this Contract. If any document placing an order on the Company includes or refers to other conditions of contract then no account shall be taken of such other conditions.

(c).ANY typographical, clerical or other error or omission in any sales literature, quotation, price list, acceptance of offer, invoice or other document or information issued by the Company shall be subject to correction without any liability on the part of the Company.

3. ACCEPTANCE OF ORDERS

(a). ALL offers and quotations by the Company are given on the basis of prompt acceptance by the Customer and shall remain open for acceptance for a period of 90 days unless revoked, withdrawn or verified by the Company prior to such acceptance.

(b). THE Company shall sell and the Customer shall purchase the Goods in accordance with the Company's Written quotation (if accepted by the Customer), or the Customer's Written order (if accepted by the Company), to the exclusion of any other conditions subject to which any such quotation is accepted or purported to be accepted, or any such order is made, or purported to be made, by the Customer.

(c). A deposit representing 20% of the total purchase price as set out in the Company's quotation ("the Deposit") shall be payable by the Customer to the Company when placing an order. Payment of the Deposit may be made by credit card, debit card or cheque.

(d). NO order submitted by a Customer shall be deemed to be accepted by the Company unless and until confirmed by the Company in writing.

(e). THE Customer shall be responsible to the Company for ensuring the accuracy of the terms of any order submitted by the Customer, and for giving the Company any necessary information relating to the Goods within a sufficient time to enable the Company to perform the Contract.

(f). ANY discrepancies contained in the quotation must be notified in writing to the Company within seven days or the Company will be entitled to assume that all details contained thereon are a correct and accurate interpretation of the Customer's requirements.

(g). AFTER the Company shall have acknowledged the Customer's order the Customer shall have a 'cooling off' period of seven working days in which to cancel the Contract (or any parts thereof). Cancellation of the Contract must be done in writing to the Company. After this period the Customer shall not be entitled to cancel the Contract (or any parts thereof) without the Written agreement of the Company. If the Contract (or any parts thereof) is cancelled at any time after the Company's acknowledgement of the Customer's order the Customer undertakes forthwith to pay the fair and reasonable cost of any or all work actually carried out by the Company prior to the date of such cancellation. Once the Customer has authorised commencement of any design work then that part of the Contract comes into force, and cannot be cancelled, irrespective of the 'cooling-off' period and the Customer undertakes forthwith to pay the fair and reasonable cost of any or all work carried out by the Company.

4. COMPANY SPECIFICATIONS ALL descriptions, specifications, drawings and particulars of layouts and dimensions submitted by the Company are to be deemed approximate only, and descriptions and illustrations in the Company's catalogues, price lists and other advertising matter shall not form any part of a Contract.

5. PRICES AND CHARGES

(a). UNTIL an order has become binding on the Company all prices are subject to change without prior notice.

(b). THE price of the Goods shall be the Company's quoted price. Prices quoted are exclusive of VAT (unless otherwise stated).

(c). AFTER an order has become binding on the Company, all prices are subject to increase to reflect variations from time to time in costs which are due to any factor beyond the control of the Company (including without limitation, costs of materials, labour, transport and any tax, fee or charge imposed by the Government or other authority) or any change in delivery dates, quantities or specifications for the Goods which is requested by the Customer, or any delay caused by any instructions of the Customer or failure of the Customer to give the Company adequate information or instructions.

6. INVOICES AND PAYMENT

(a). UNLESS otherwise deemed by the Company or stated in Writing the net invoice amount is payable prior to delivery of the Goods ("the Due Date").

(b). IF the Customer defaults in payment the Company may, in addition to exercising rights as above, and without prejudice to any other right or remedy available to the Company cancel the contract and cancel any other orders received from the Customer.

(**c**). AFTER the Due Date interest will, at the discretion of the Company, be chargeable at a rate not greater than 5% above the base rate of Lloyds Bank Plc from time to time calculated, ("the Base Rate"), from the date payment was due until and including the date of actual payment. If any invoice is not paid on the Due Date all other invoices rendered by the Company shall thereupon be deemed due and immediately become payable in full

(d). IF the Customer issues a cheque which is not honoured on presentation or if the Company deems it necessary to arrange the special presentation of a cheque the Company reserves the right to debit the Customer with the cost of doing so.

7. DELIVERY OF GOODS

(a). DELIVERY of the Goods shall be made by the Company delivering the Goods at the time and the place notified by the Customer or if the Customer wrongfully fails to take delivery of the Goods, the time when the Company has tendered delivery of the Goods. Where goods are sent to a destination outside the United Kingdom, the provisions of INCOTERMS shall apply.

(b). ANY time or date specified by the Company as the time at which or date on which the Goods will be delivered is given and intended as an estimate only and the Company shall not be liable for any loss, damage or expense howsoever arising from any delay in delivery howsoever caused. The time for delivery shall not be of the essence unless previously agreed by the Company in Writing. The Goods may be delivered by the Company in advance of the quoted delivery date upon giving reasonable notice to the Customer.

(c). THE Company reserves the right to make delivery by instalments unless otherwise expressly stipulated in the Contract, and these Conditions shall apply to each instalment delivery and any claim by the Customer in respect of any one or more instalments shall not entitle the Customer to treat the Contract as a whole as repudiated.

(d). IF the Company failed to deliver the Goods (or any instalment) for any reason other than any cause beyond the Company's reasonable control, or the Customers fault, and the Company is accordingly liable to the Customer, the Company's liability shall be limited to the excess (if any) of a cost to the Customer (in the cheapest available market) of similar goods to replace those not delivered over the price of the Goods.

(e). If the Customer fails to take delivery of the Goods or fails to give the Company adequate delivery instructions at the time stated for delivery then, without limiting any other right or remedy available to the Company, the Company may:

(i). Store the Goods until actual delivery and charge the Customer for the reasonable costs (including insurance of storage); or

(ii). Sell the Goods at the best price readily obtainable and (after deducting all reasonable storage and selling expenses) account to the Customer for the excess over the price under the Contract or charge the Customer for any shortfall below the price under the Contract (f). THE mode of transport shall be at the Company's discretion. For deliveries outside mainland Great Britain, the Company shall be entitled to charge all additional delivery costs to the Customer's account.

8. INSPECTION OF GOODS DELIVERED

Goods must be carefully examined on arrival at the Customer's premises, and acceptance thereof duly signed for by the Customer or his appointed agent will be deemed to constitute acceptance by the Customer of the Goods in good condition and conformity in all respects with the order.

9. DEFECTIVE GOODS

(a). SUBJECT to the exclusions set out in (b) below, the Company warrants that the Goods will correspond with their specification at the time of delivery and will be free from defects in material and workmanship from the date of delivery for the following periods: **(i)** Floor heating tube: 10 (ten) years

(ii) All other goods: As per manufacturer's warranty

(b). THE above warranty is given by the Company subject to the following conditions:

(i) THE Company shall be under no liability in respect of any defect in the goods arising from any drawing, design or specification supplied by the Customer;

(ii) THE Company shall be under no liability in respect of any defect arising from fair wear or tear, wilful damage, negligence, abnormal working conditions, failure to follow the Company's instructions (whether oral or in Writing), misuse or alteration or repair of the goods without the Company's approval;

(iii) THE Company shall be under no liability under the above warranty (or any other warranty, condition or guarantee) if the total price for the goods has not been paid by the Due Date for payment;

(iv) THE above warranty does not extend to parts, materials or other equipment not manufactured by the Company, in respect of which the Customer shall only be entitled to the benefit of any such warranty or guarantee as is given by the manufacturer to the Company

(c). A claim by the Customer which is based on any defect in the quality or condition of the Goods or their failure to correspond with specification shall (whether or not delivery is refused by the Customer) be notified to the Company within seven days from the date of delivery or (whether defect or failure was not apparent on reasonable inspection) within a reasonable time after discovery of the defect or failure. If delivery is not refused, and the Customer does not notify the Company accordingly, the Customer shall not be entitled to reject the Goods and the Company shall have no liability for such defect or failure, and the Customer shall be bound to pay the price as if the Goods had been delivered in accordance with the Contract.

(d).WHERE Goods are returned by the Customer and accepted as defective by the Company, the Company shall at its option either repair or replace such Goods without cost to the Customer or allow the Customer to credit therefore. The Customer shall not be entitled to make any claim in respect of such Goods for work done thereon, transport costs, loss of profit on resale or in respect of any claim, loss, damage or expense whatsoever other than replacement cost.

(e). THE Customer shall not be entitled to withhold payment by reason of an alleged minor defect.

(f). EXCEPT as expressly provided in these Conditions, and except where the goods are sold to a person dealing as a consumer (within the meaning of Unfair Contract Terms Act 1977), all warranties, conditions or other terms implied by statute or common law are excluded.

(g). WHERE the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Customer are not affected by these conditions.

(h). EXCEPT in respect of death or personal injury caused by the Company's negligence, or liability for defective products under the Consumer Protection Act 1987 the Company shall not be liable to the Customer by reason of any representation, or any implied warranty, condition or other term, or any duty at common law under the express terms of the contract, for any consequential loss or damage (whether for loss of profit or otherwise), costs expenses or other claims for consequential compensation whatsoever (and whether caused by the negligence of the Company or its employees or agents or otherwise) which arise out of or in connection with the supply of the goods or their use or resale by the Customer, except as expressly provided in these Conditions.

10. RISK AND PROPERTY

(a). RISK of damage to or loss of the Goods shall pass to the Customer:

(i) in the case of Goods to be delivered at the Company's premises, at the time when the Company notifies the Customer that the Goods are available for collection; or

(ii) in the case of Goods to be delivered otherwise than at the Company's premises, at the time of delivery or, if the Customer wrongfully fails to take delivery of the Goods, the time when the Company has tendered delivery of the Goods.

(b). NOTWITHSTANDING delivery and the passing of risk in the Goods, or any other provision of these Conditions, the property in the Goods shall not pass to the Customer until the Company has received in cash or cleared funds payment in full of the price of the Goods and all other goods agreed to be sold by the Company to the Customer for which payment is then due.

(c). UNTIL such time as the property in the Goods passes to the Customer, the Customer shall hold the Goods as the Company's fiduciary agent and bailee, and shall keep the Goods separate from those of the Customer and third parties and properly stored, protected and insured and identified as the Company's property, but the Customer shall be entitled to re-sell or use the Goods in the ordinary course of its business. (d). UNTIL such time as the property in the Goods passes to the Customer (and provided the Goods are still in existence and have not been resold), the Company shall be entitled at any time to require the Buyer to deliver up the Goods to the Company and, if the Buyer fails to do so forthwith, to enter upon any premises of the Buyer or any third party where the Goods are stored and repossess the Goods. (e). THE Customer shall not be entitled to pledge or in any way charge by way of security for any indebtedness any of the Goods which remain the property of the Company, but if the Customer does so all moneys owing by the Customer to the Company shall (without prejudice to any other right or remedy of the Company) forthwith become due and payable.

11. INSTALLATION

(a).WHERE the Company provides installation work, or advice to the Customer, it warrants that such work shall be done or such advice given with reasonable skill and care.

(b). THE Company does not accept liability for any action or omission on the part of any approved installer or other person.

(c). IT is the responsibility of the Customer to obtain any required planning permission and to ensure that the work to be undertaken complies with building regulations including any LOCAL building code.

(d). THE Company shall not be liable in respect of any waste or damage to or interference with any water supply whether public or private whether under the Environmental Protection Act 1990, the Water Industries Act 1991, the Water Resources Act 1991 or otherwise in connection with the supply or installation of Goods and it shall be the Customer's responsibility to ensure that any reasonable requirements in respect of water supplies and the presence on land of waste are complied with fully. If a claim is made against the Company under any of the aforegoing legislation then the Customer shall indemnify the Company against all loss, damages, costs and expenses awarded against or incurred by the Company in connection with the claim.

12. FORCE MAJEURE

THE Company shall not be liable to the Customer to the extent that fulfilment of its obligation to the Customer has been prevented, hindered or delayed by force majeure as hereinafter defined and without limiting the generality of the foregoing the Company shall be entitled to cancel delivery in whole or in part when it is delayed in or prevented from making delivering by strikes, lock-outs, trade disputes or labour troubles or any cause beyond the Company+'s control including, but without limitation, Act of God, embargo, or other Governmental Act, regulation or request, fire, accident, war, riot, delay in transportation, inability to obtain adequate labour, materials, or manufacturing facilities ('force majeure'), and the Company shall not be bound to obtain in the market goods with which to replace goods delivery of which has been cancelled as a result of any said events.

13. PATENTS/MODIFICATIONS AND IMPROVEMENTS

(a). IN cases where the Customer provides drawings, designs, models or specifications, for the purpose of enabling the Company to fulfil the Contract, the Customer shall indemnify the Company against all actions, claims, costs, damages or losses arising from any infringement of letters patent, design, trademark or copyright protected by law in respect of such drawings, models or specifications or any Goods made or supplied by the Company in compliance therewith. (b). THE Company reserves the right to undertake such modifications or improvements to any of its products as shall be deemed necessary from time to time without any prior notification and such modifications or improvements shall not entitle the Customer to reject the Goods so improved or modified or any products previously supplied to the Customer prior to the modification or improvement being effected.

14. MISCELLANEOUS

(a). A person who is not a party to the Contract has no right under the Contract (Rights of Third Parties) Act 1999 to enforce any term of the Contract but this does not affect any right or remedy of a third party which exists or is available apart from that Act.

(b). THE validity, construction, and performance of this contract shall be governed by the Law of England and be within the exclusive jurisdiction of the English Courts.

(c). ANY notice relating to these Conditions shall be in writing and may be served or delivered to the party to be served in the case of a Company at its registered office and in the case of an individual at his address notified in writing to the other party from time to time and notices sent by first class delivery mail shall be deemed to have been delivered seventy-two hours after posting and proof of due posting shall be sufficient evidence of delivery.

(d). THE headings of these Conditions are for ease of reference only and do not affect their construction and nor to they limit their scope.

(e). THE singular, where appropriate includes the plural and vice versa.

(f). IF any provision of these Conditions is held by any competent authority to be invalid or unenforceable in whole or in part the validity of the other provisions of these Conditions and the remainder of the provision in question shall not be affected thereby.

(g). NO waiver by the Company of any breach of the contract by the Customer shall be considered as a waiver of any subsequent breach of the same or any other provision.

Nu-Heat
UNDERFLOOR & RENEWABLES

UNDERFLOOR HEATING · HEAT PUMPS · SOLAR THERMAL

Quote details

Underfloor Heating: Quotation

Customer number:	NS35922:14 Faithful & Gould : Faithful & Gould - Exeter	
Site address:	Trewirgie Junior School, Falmouth Road, Redruth, TR15 2QN	
Quotation number:	UFH159916	
Quotation date:	22/8/2019	
Account Manager:	James.Davies@nu-heat.co.uk	**Tel:** null

Quote for heating components using a heat pump, based on:
Ground floor - Screed with cliptrack®,

System Specification

Description	Area (m²)
Screed with cliptrack® - view floor construction	171.6

Your Quote Price **£4039.0 + VAT**

(for design and supply only)

Recommended Extras

Add a heated towel rail from £49 + VAT

Choosing to fit a Nu-Heat heated towel rail for your bathroom will ensure you have warm and dry towels all year round - even when your underfloor heating is not needed. Choose from our contemporary range of stylish towel rails to complement your underfloor heating system.

Find out more

More extras can be found under the "Upgrades and Extras" section below

Any images shown in this quote are for illustration purposes only and should not be used as an installation reference. For floor construction details specific to your project please refer to the PDF file/s above.

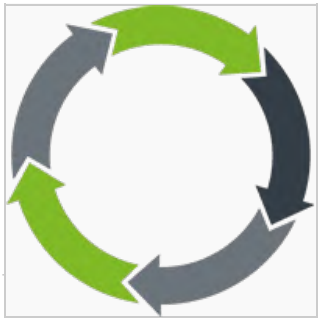
This quotation is subject to our terms and conditions and product warranties

Nu-Heat
NDERFLOOR & RENEWABLES

Quote details

What Nu-Heat offers you

Expert advice and specification support



Our team are always here to offer support before, during and after the system is installed.

- Your Technical Account Manager can provide valuable advice during the early stages of a project (RIBA 1-4), helping to specify a tailored, efficient solution
- Site visits can be arranged, if required
- The Technical Support Team is always to hand to help with any installation queries or aftercare support should you need it

Providing complete confidence for you and your customers

Nu-Heat has over 20 years experience designing and supplying heating solutions for a wide range of projects, whether a new-build, renovation, or office-to-residential conversion.

Our precise design service gives you and your customer peace of mind that the system will be efficient and perform as required, even in the coldest winter months. Your Designer will assess each room that will be heated, together with usable space and chosen floor finishes, to identify the most suitable floor construction, ensuring optimal outputs and an even heat distribution.

- For complete reassurance we are backed by a £5million Professional Indemnity Insurance
- Bespoke system design and detailed set-up information is provided as standard* along with end user guides for the homeowner
- For heat pump and solar thermal systems, MCS support is available with the option of on-site commissioning

*excludes OneZone systems

Proud of our reputation

Nu-Heat is one of the most established specialised suppliers of warm water underfloor heating and renewables in the country, having been founded in 1992. Many of our systems are completely unique in the market, featuring collaborations with Knauf and Thermal Economics, and can be tailored to meet the specific project requirement.

Our core values of offering the best system design, innovative products, unbeatable expertise and superior customer service are just as important today and we are proud members of the Institute of Customer Service.

The Institute of Customer Service MEMBER | RECC RENEWABLE ENERGY CONSUMER CODE | beama Underfloor | KNAUF

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Rooms

Manifolds

No.	Location	Ports
1	Plant	11

Rooms

Room	Floor Construction	Design Temp °C	Thermostat	Floor	Manifold
Lobby	Screed with cliptrack®	21	Dial	G	1
WCs	Screed with cliptrack®	21	Dial	G	1
Classroom	Screed with cliptrack®	21	Dial	G	1
Classroom	Screed with cliptrack®	21	Dial	G	1

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

What's Included

Your system price - What's included?

Qty	Item Description
1	Wilo Para SC7 pump (EuP compliant) with valves
1	Isolator pack for Optiflo manifolds
1	System expansion vessel
1	11-port Optiflo manifold module with zone valves, flow meters, isolating valves, temperature gauges, pressure gauge and wiring centre - view details
4	Dial thermostat - view details
1056	Metres of 14mm Fastflo® heating tube with oxygen diffusion barrier - view details
22	14mm x 2mm Eurofitting nut, tail & olive and pipe bend support
172	m² SL14 floor components - Cliptrack-14, screed expansion edge strip, staples
1	Commissioning accessories pack
1	Design specification, manuals and documentation - view details
1	Delivery to UK mainland only following receipt of full payment and acceptance of CAD drawings.

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Quote details

Upgrades and Extras

Included in your quote

Standard dial thermostat

A dial thermostat with 4-channel timeclock and setback facility is supplied as standard. It offers a stylish yet simple and straightforward method of controlling an underfloor heating system.
View product fiche

Thermostat Upgrades

All prices quoted are excluding VAT and indicate the total price for upgrading all of the thermostats in your quote.

Programmable neoStats

The high-quality, slim-line, hard-wired, programmable neoStat thermostat is fully compatible with home automation systems. Features include holiday and temperature hold, soft touch operation and energy-saving Optimum Start.
neoStats are available in black, white and silver.

Total upgrade price **£236.16**

Find out more
View product fiche

Wireless neoAir

A popular solution for renovation projects, the battery-powered, wireless neoAir thermostat offers the same functionality as the neoStat, without the need to chase wiring into walls.
The neoAir is available in black, white and silver.

Total upgrade price **£341.57**

Find out more
View product fiche

Customers also bought

Code	Item Description	Price
LPDCM/10-C	Decoupling membrane for tiling - suitable for use with all underfloor heating systems (1m x 10m roll)	£96.53

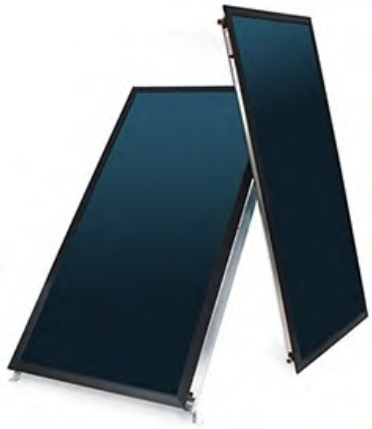
Please note: Upgrade Option prices valid until point of delivery.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Solar Thermal Hot Water **Upgrade**

Capture free solar energy and use it to heat domestic hot water with Nu-Heat's EnergyPro® solar thermal panels.



- Produces up to 60% of annual hot water demand, up to 100% in the summer months
- Quick and easy to install
- MCS approved
- Eligible for RHI grant - up to £1,795 over 7 years

2 panel Solar Thermal In Roof systems start from £1,900 +VAT. Speak to your Account Manager for a quotation.

Considering solar in the future?

Future proof your home with an EnergyPro® cylinder, featuring a second coil which is ready to be linked to a solar collector system.

- 25 year warranty
- Lightweight all-stainless-steel construction
- Supplied complete with connection fittings and G3 equipment
- Connection positions at front of the unit for simple installation, easy access and minimal space requirements
- Starting from £939+VAT

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Notes

The notes below are important information for you to understand in relation to this system. If you have any questions please feel free to contact me on James.Davies@nu-heat.co.uk or null for further information.

Please Check

Is our interpretation of the project plans/information provided correct?

This quote has been prepared based on the information and/or plans supplied. Should our interpretation be incorrect, please let us know as soon as you can.

Don't forget ErP!

From 26th September 2015 all installers must calculate an energy efficiency rating for any new heating system package installed e.g. a boiler with thermostats. It's easy to do this yourself. Visit our ErP page here to watch the video and download our calculation forms.

Quote details

The Next Step

What's Next?

How to order

To place your order, discuss your quote, add extras or make any other changes, please contact me on:

null or email James.Davies@nu-heat.co.uk

Design

On confirming your order, Nu-Heat will complete a thorough design process resulting in detailed CAD layouts, manifold locations and wiring diagrams. In busy periods, our design process can take up to three weeks, although we always do our best to design systems as quickly as possible. Please contact us in good time to ensure that we can meet your project deadlines.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Notes

Design

On confirming your order, Nu-Heat will complete a detailed design process resulting in detailed CAD layouts, manifold locations and wiring diagrams. An example of our award-winning manuals can be found on our website at www.nu-heat.co.uk.

Heat Source

Underfloor heating can be used in conjunction with a number of different heat sources: gas or oil boilers, LPG or heat pump technology. Nu-Heat supplies high quality heat pumps from NIBE and is happy to work with alternative suppliers.

Components excluded

It is Nu-Heat's policy to only supply complete, fully designed systems with all components selected and matched in an overall design to ensure compatibility. You need only supply pipework to the Optiflo manifolds, plus electrical wiring components. Please see the floor construction sections of this quotation for floor insulation requirements, and the items included within this quotation. The components supplied meet all relevant UK and European standards.

Room thermostats

Nu-Heat provides room thermostat options to meet your customer requirements. These are detailed in the Options Brochure included with this quotation or available online. Separate control is provided in every main room of the building.

Floor constructions

Fastflo® floor heating tube in renowned for its flexibility, the benefits of which include saving on installation time and improved comfort due to closer spacing. Closer spacing provides an even spread of warmth across the floor and rapid response times because the warm water has less distance to travel through the shorter tube lengths. Nu-Heat has over sixty floor construction options, therefore should the one specified not meet your project requirements please contact your Nu-Heat Account Manager to discuss alternatives. Note: Please inform us at design stage if a hardwood floor finish has been specified, as a floor-temperature sensing thermostat may be required to prevent overheating - this is a no-cost option.

Insurances/Warranties

See Product Warranties documentation.

Nu-Heat
UNDERFLOOR & RENEWABLES

Quote details

Terms and Conditions

NU-HEAT UK LIMITED
Company No. 3131852

1. DEFINITION "The Company" means Nu-Heat U.K. Limited of Heathpark House, Devonshire Road, Heathpark Industrial Estate, Honiton, Devon EX14 1SD. "The Conditions" means the standard conditions of sale set out in this document and (unless the context otherwise requires) includes any special terms agreed in Writing between the Company and the Customer. "The Contract" means the contract for the sale and purchase of the Goods and/or Services. "The Customer" means any person contracting with the Company. "Services" means any service which the company is to provide in accordance with these Conditions. "The Goods" means the Goods (including any instalment of the goods or any parts for them) which the Company is to supply in accordance with these Conditions. "Writing" and any similar expression, includes a facsimile transmission, email, and other comparable means of communication.

2. APPLICATION

(a). THE Company's Conditions are set out below to the exclusion of all other conditions, and shall be incorporated in every offer, quotation, acceptance and the Contract for the sale or supply of Goods or services by the Company. No addition to, or variation of these Conditions will bind the Company unless it is specifically agreed in writing and signed by a Director of the Company. No agent or person employed by, or under contract with the Company has any authority to alter or vary in any way these Conditions except as stated above.

(b). IF these Conditions are so varied then, subject to the express terms of that variation, these Conditions shall continue to apply as if that variation were incorporated in this Contract. If any document placing an order on the Company includes or refers to other conditions of contract then no account shall be taken of such other conditions.

(c).ANY typographical, clerical or other error or omission in any sales literature, quotation, price list, acceptance of offer, invoice or other document or information issued by the Company shall be subject to correction without any liability on the part of the Company.

3. ACCEPTANCE OF ORDERS

(a). ALL offers and quotations by the Company are given on the basis of prompt acceptance by the Customer and shall remain open for acceptance for a period of 90 days unless revoked, withdrawn or verified by the Company prior to such acceptance.

(b). THE Company shall sell and the Customer shall purchase the Goods in accordance with the Company's Written quotation (if accepted by the Customer), or the Customer's Written order (if accepted by the Company), to the exclusion of any other conditions subject to which any such quotation is accepted or purported to be accepted, or any such order is made, or purported to be made, by the Customer.

(c). A deposit representing 20% of the total purchase price as set out in the Company's quotation ("the Deposit") shall be payable by the Customer to the Company when placing an order. Payment of the Deposit may be made by credit card, debit card or cheque.

(d). NO order submitted by a Customer shall be deemed to be accepted by the Company unless and until confirmed by the Company in writing.

(e). THE Customer shall be responsible to the Company for ensuring the accuracy of the terms of any order submitted by the Customer, and for giving the Company any necessary information relating to the Goods within a sufficient time to enable the Company to perform the Contract.

(f). ANY discrepancies contained in the quotation must be notified in writing to the Company within seven days or the Company will be entitled to assume that all details contained thereon are a correct and accurate interpretation of the Customer's requirements.

(g). AFTER the Company shall have acknowledged the Customer's order the Customer shall have a 'cooling off' period of seven working days in which to cancel the Contract (or any parts thereof). Cancellation of the Contract must be done in writing to the Company. After this period the Customer shall not be entitled to cancel the Contract (or any parts thereof) without the Written agreement of the Company. If the Contract (or any parts thereof) is cancelled at any time after the Company's acknowledgement of the Customer's order the Customer undertakes forthwith to pay the fair and reasonable cost of any or all work actually carried out by the Company prior to the date of such cancellation. Once the Customer has authorised commencement of any design work then that part of the Contract comes into force, and cannot be cancelled, irrespective of the 'cooling-off' period and the Customer undertakes forthwith to pay the fair and reasonable cost of any or all work carried out by the Company.

4. COMPANY SPECIFICATIONS ALL descriptions, specifications, drawings and particulars of layouts and dimensions submitted by the Company are to be deemed approximate only, and descriptions and illustrations in the Company's catalogues, price lists and other advertising matter shall not form any part of a Contract.

5. PRICES AND CHARGES

(a). UNTIL an order has become binding on the Company all prices are subject to change without prior notice.

(b). THE price of the Goods shall be the Company's quoted price. Prices quoted are exclusive of VAT (unless otherwise stated).

(c). AFTER an order has become binding on the Company, all prices are subject to increase to reflect variations from time to time in costs which are due to any factor beyond the control of the Company (including without limitation, costs of materials, labour, transport and any tax, fee or charge imposed by the Government or other authority) or any change in delivery dates, quantities or specifications for the Goods which is requested by the Customer, or any delay caused by any instructions of the Customer or failure of the Customer to give the Company adequate information or instructions.

6. INVOICES AND PAYMENT

(a). UNLESS otherwise deemed by the Company or stated in Writing the net invoice amount is payable prior to delivery of the Goods ("the Due Date").

(b). IF the Customer defaults in payment the Company may, in addition to exercising rights as above, and without prejudice to any other right or remedy available to the Company cancel the contract and cancel any other orders received from the Customer.

(**c**). AFTER the Due Date interest will, at the discretion of the Company, be chargeable at a rate not greater than 5% above the base rate of Lloyds Bank Plc from time to time calculated, ("the Base Rate"), from the date payment was due until and including the date of actual payment. If any invoice is not paid on the Due Date all other invoices rendered by the Company shall thereupon be deemed due and immediately become payable in full

(d). IF the Customer issues a cheque which is not honoured on presentation or if the Company deems it necessary to arrange the special presentation of a cheque the Company reserves the right to debit the Customer with the cost of doing so.

7. DELIVERY OF GOODS

(a). DELIVERY of the Goods shall be made by the Company delivering the Goods at the time and the place notified by the Customer or if the Customer wrongfully fails to take delivery of the Goods, the time when the Company has tendered delivery of the Goods. Where goods are sent to a destination outside the United Kingdom, the provisions of INCOTERMS shall apply.

(b). ANY time or date specified by the Company as the time at which or date on which the Goods will be delivered is given and intended as an estimate only and the Company shall not be liable for any loss, damage or expense howsoever arising from any delay in delivery howsoever caused. The time for delivery shall not be of the essence unless previously agreed by the Company in Writing. The Goods may be delivered by the Company in advance of the quoted delivery date upon giving reasonable notice to the Customer.

(c). THE Company reserves the right to make delivery by instalments unless otherwise expressly stipulated in the Contract, and these Conditions shall apply to each instalment delivery and any claim by the Customer in respect of any one or more instalments shall not entitle the Customer to treat the Contract as a whole as repudiated.

(d). IF the Company failed to deliver the Goods (or any instalment) for any reason other than any cause beyond the Company's reasonable control, or the Customers fault, and the Company is accordingly liable to the Customer, the Company's liability shall be limited to the excess (if any) of a cost to the Customer (in the cheapest available market) of similar goods to replace those not delivered over the price of the Goods.

(e). If the Customer fails to take delivery of the Goods or fails to give the Company adequate delivery instructions at the time stated for delivery then, without limiting any other right or remedy available to the Company, the Company may:

(i). Store the Goods until actual delivery and charge the Customer for the reasonable costs (including insurance of storage); or

(ii). Sell the Goods at the best price readily obtainable and (after deducting all reasonable storage and selling expenses) account to the Customer for the excess over the price under the Contract or charge the Customer for any shortfall below the price under the Contract (f). THE mode of transport shall be at the Company's discretion. For deliveries outside mainland Great Britain, the Company shall be entitled to charge all additional delivery costs to the Customer's account.

8. INSPECTION OF GOODS DELIVERED

Goods must be carefully examined on arrival at the Customer's premises, and acceptance thereof duly signed for by the Customer or his appointed agent will be deemed to constitute acceptance by the Customer of the Goods in good condition and conformity in all respects with the order.

9. DEFECTIVE GOODS

(a). SUBJECT to the exclusions set out in (b) below, the Company warrants that the Goods will correspond with their specification at the time of delivery and will be free from defects in material and workmanship from the date of delivery for the following periods: **(i)** Floor heating tube: 10 (ten) years

(ii) All other goods: As per manufacturer's warranty

(b). THE above warranty is given by the Company subject to the following conditions:

(i) THE Company shall be under no liability in respect of any defect in the goods arising from any drawing, design or specification supplied by the Customer;

(ii) THE Company shall be under no liability in respect of any defect arising from fair wear or tear, wilful damage, negligence, abnormal working conditions, failure to follow the Company's instructions (whether oral or in Writing), misuse or alteration or repair of the goods without the Company's approval;

(iii) THE Company shall be under no liability under the above warranty (or any other warranty, condition or guarantee) if the total price for the goods has not been paid by the Due Date for payment;

(iv) THE above warranty does not extend to parts, materials or other equipment not manufactured by the Company, in respect of which the Customer shall only be entitled to the benefit of any such warranty or guarantee as is given by the manufacturer to the Company

(c). A claim by the Customer which is based on any defect in the quality or condition of the Goods or their failure to correspond with specification shall (whether or not delivery is refused by the Customer) be notified to the Company within seven days from the date of delivery or (whether defect or failure was not apparent on reasonable inspection) within a reasonable time after discovery of the defect or failure. If delivery is not refused, and the Customer does not notify the Company accordingly, the Customer shall not be entitled to reject the Goods and the Company shall have no liability for such defect or failure, and the Customer shall be bound to pay the price as if the Goods had been delivered in accordance with the Contract.

(d).WHERE Goods are returned by the Customer and accepted as defective by the Company, the Company shall at its option either repair or replace such Goods without cost to the Customer or allow the Customer to credit therefore. The Customer shall not be entitled to make any claim in respect of such Goods for work done thereon, transport costs, loss of profit on resale or in respect of any claim, loss, damage or expense whatsoever other than replacement cost.

(e). THE Customer shall not be entitled to withhold payment by reason of an alleged minor defect.

(f). EXCEPT as expressly provided in these Conditions, and except where the goods are sold to a person dealing as a consumer (within the meaning of Unfair Contract Terms Act 1977), all warranties, conditions or other terms implied by statute or common law are excluded.

(g). WHERE the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Customer are not affected by these conditions.

(h). EXCEPT in respect of death or personal injury caused by the Company's negligence, or liability for defective products under the Consumer Protection Act 1987 the Company shall not be liable to the Customer by reason of any representation, or any implied warranty, condition or other term, or any duty at common law under the express terms of the contract, for any consequential loss or damage (whether for loss of profit or otherwise), costs expenses or other claims for consequential compensation whatsoever (and whether caused by the negligence of the Company or its employees or agents or otherwise) which arise out of or in connection with the supply of the goods or their use or resale by the Customer, except as expressly provided in these Conditions.

10. RISK AND PROPERTY

(a). RISK of damage to or loss of the Goods shall pass to the Customer:

(i) in the case of Goods to be delivered at the Company's premises, at the time when the Company notifies the Customer that the Goods are available for collection; or

(ii) in the case of Goods to be delivered otherwise than at the Company's premises, at the time of delivery or, if the Customer wrongfully fails to take delivery of the Goods, the time when the Company has tendered delivery of the Goods.

(b). NOTWITHSTANDING delivery and the passing of risk in the Goods, or any other provision of these Conditions, the property in the Goods shall not pass to the Customer until the Company has received in cash or cleared funds payment in full of the price of the Goods and all other goods agreed to be sold by the Company to the Customer for which payment is then due.

(c). UNTIL such time as the property in the Goods passes to the Customer, the Customer shall hold the Goods as the Company's fiduciary agent and bailee, and shall keep the Goods separate from those of the Customer and third parties and properly stored, protected and insured and identified as the Company's property, but the Customer shall be entitled to re-sell or use the Goods in the ordinary course of its business. (d). UNTIL such time as the property in the Goods passes to the Customer (and provided the Goods are still in existence and have not been resold), the Company shall be entitled at any time to require the Buyer to deliver up the Goods to the Company and, if the Buyer fails to do so forthwith, to enter upon any premises of the Buyer or any third party where the Goods are stored and repossess the Goods. (e). THE Customer shall not be entitled to pledge or in any way charge by way of security for any indebtedness any of the Goods which remain the property of the Company, but if the Customer does so all moneys owing by the Customer to the Company shall (without prejudice to any other right or remedy of the Company) forthwith become due and payable.

11. INSTALLATION

(a).WHERE the Company provides installation work, or advice to the Customer, it warrants that such work shall be done or such advice given with reasonable skill and care.

(b). THE Company does not accept liability for any action or omission on the part of any approved installer or other person.

(c). IT is the responsibility of the Customer to obtain any required planning permission and to ensure that the work to be undertaken complies with building regulations including any LOCAL building code.

(d). THE Company shall not be liable in respect of any waste or damage to or interference with any water supply whether public or private whether under the Environmental Protection Act 1990, the Water Industries Act 1991, the Water Resources Act 1991 or otherwise in connection with the supply or installation of Goods and it shall be the Customer's responsibility to ensure that any reasonable requirements in respect of water supplies and the presence on land of waste are complied with fully. If a claim is made against the Company under any of the aforegoing legislation then the Customer shall indemnify the Company against all loss, damages, costs and expenses awarded against or incurred by the Company in connection with the claim.

12. FORCE MAJEURE

THE Company shall not be liable to the Customer to the extent that fulfilment of its obligation to the Customer has been prevented, hindered or delayed by force majeure as hereinafter defined and without limiting the generality of the foregoing the Company shall be entitled to cancel delivery in whole or in part when it is delayed in or prevented from making delivering by strikes, lock-outs, trade disputes or labour troubles or any cause beyond the Company+'s control including, but without limitation, Act of God, embargo, or other Governmental Act, regulation or request, fire, accident, war, riot, delay in transportation, inability to obtain adequate labour, materials, or manufacturing facilities ('force majeure'), and the Company shall not be bound to obtain in the market goods with which to replace goods delivery of which has been cancelled as a result of any said events.

13. PATENTS/MODIFICATIONS AND IMPROVEMENTS

(a). IN cases where the Customer provides drawings, designs, models or specifications, for the purpose of enabling the Company to fulfil the Contract, the Customer shall indemnify the Company against all actions, claims, costs, damages or losses arising from any infringement of letters patent, design, trademark or copyright protected by law in respect of such drawings, models or specifications or any Goods made or supplied by the Company in compliance therewith. (b). THE Company reserves the right to undertake such modifications or improvements to any of its products as shall be deemed necessary from time to time without any prior notification and such modifications or improvements shall not entitle the Customer to reject the Goods so improved or modified or any products previously supplied to the Customer prior to the modification or improvement being effected.

14. MISCELLANEOUS

(a). A person who is not a party to the Contract has no right under the Contract (Rights of Third Parties) Act 1999 to enforce any term of the Contract but this does not affect any right or remedy of a third party which exists or is available apart from that Act.

(b). THE validity, construction, and performance of this contract shall be governed by the Law of England and be within the exclusive jurisdiction of the English Courts.

(c). ANY notice relating to these Conditions shall be in writing and may be served or delivered to the party to be served in the case of a Company at its registered office and in the case of an individual at his address notified in writing to the other party from time to time and notices sent by first class delivery mail shall be deemed to have been delivered seventy-two hours after posting and proof of due posting shall be sufficient evidence of delivery.

(d). THE headings of these Conditions are for ease of reference only and do not affect their construction and nor to they limit their scope.

(e). THE singular, where appropriate includes the plural and vice versa.

(f). IF any provision of these Conditions is held by any competent authority to be invalid or unenforceable in whole or in part the validity of the other provisions of these Conditions and the remainder of the provision in question shall not be affected thereby.

(g). NO waiver by the Company of any breach of the contract by the Customer shall be considered as a waiver of any subsequent breach of the same or any other provision.

Appendix L. Internal Doors

L.1. Door Schedule

Door Identifier	Door Pattern	Fire rating	Finish	Notes
D001	Flat plain door	FD30S	Formica Azur Blue Matte with American white oak lipping.	Will require eurolock and escutcheon and Fire Door Keep Locked signage.
D002	Pattern Type 2 (below)	FD30S	American white oak veneer	Self Closer with signage and mortice latch.
D003	Pattern Type 2 (below)	FD30S	American white oak veneer	Self Closer with signage and mortice latch.
D004	Flat plain door	Nil	Formica Azur Blue Matte with American white oak lipping.	WC door lock suitable for Primary/Junior age.
D005	Flat plain door	Nil	Formica Azur Blue Matte with American white oak lipping.	WC door lock compliant with Part M and BS8300 suitable for Primary/Junior age.
D006	Flat plain door	Nil	Formica Azur Blue Matte with American white oak lipping.	WC door lock suitable for Primary/Junior age.
D007	Flat plain door	Nil	Formica Azur Blue Matte with American white oak lipping.	WC door lock suitable for Primary/Junior age.
D008	Flat plain door	FD30S	Formica Azur Blue Matte with American white oak lipping.	Will require eurolock and escutcheon and Fire Door Keep Locked signage.
D009	Flat plain door	FD30S	Formica Azur Blue Matte with American white oak lipping.	Will require eurolock and escutcheon and Fire Door Keep Locked signage.

L.2. Door Identifier Drawing 5188434-BS-DS-01

DO NOT SCALE
Use only written dimension. All dimension must be verified prior to works being put into hand and any discrepancies reported to the originator.

Health and Safety Information

	Details	Sign	Date
Asbestos Survey			
Structural Check/Lifting & Handling			
Site Survey			
Access and Egress/Site Compound			
Hazards Identified			

General Notes

Drawing to be read in conjunction with door schedule information Appendix L.

REV	Details of Revision	Date	Sign

Client

FAITHFUL+GOULD
The Octagon, 2nd Floor, Pynes Hill Court, Rydon Lane, Exeter, EX2 5AZ
Tel: +44(0)1392 813100
Fax: +44(0)1392 352999

Project
Trewirgie Junior School, Falmouth Rd, Redruth, TR15 2QN

Title
Door Plan

Drawing No
5188434-BS-DS-01

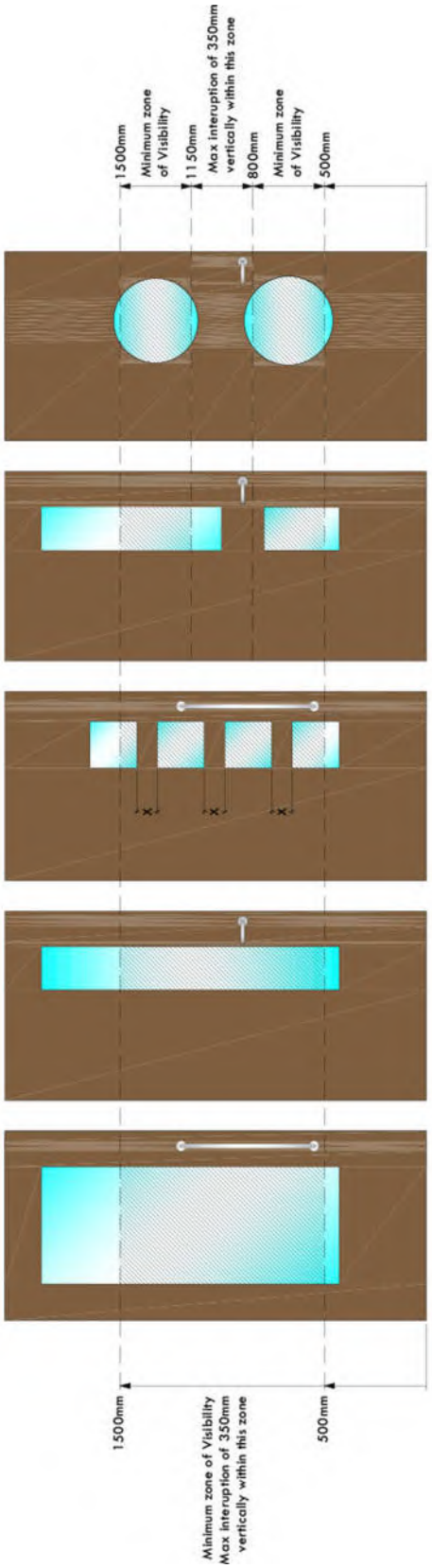
Scale	Drawn	Checked	Co-ord chk
1:100	ST	TU	
Drawing size	**Date**	**Date**	**Date**
A3	11/09/19	11/09/19	

Status
INFORMATION

L.3. Classroom Door Pattern

Classroom Door Pattern;

- Door to be as pattern type 2 handed as shown in 5188434-ATK-XX-GF-DR-S-1001
- Doors to be finished in American white oak veneer.



Type 2

L.4. SWS Ironmongery Specification

IRONMONGERY SCHEDULE

Project: Trewirgie Junior School, Redruth

Project Address : -

Ref: 002683

Date: 12/09/19
Revision: 0
Prepared By: Rolf Coates

SWS

Waterside
Collett Way
Brunel Industrial Estate
NEWTON ABBOT
Devon TQ12 4PH

Tel : 01626 333900
Fax : 01626 324297

Ref : 002683
Date : 12/09/19
Revision : 0

GENERAL INFORMATION

SWS aim to provide this schedule and/or quotation in accordance with relevant British Standards and current legislation.

If master keying of locks is included in the specification we require you to supply exact details of your keying requirements.

Kicking plate sizes are approximate. Final site sizing will be required from the contractor prior to ordering. Prices may be adjusted by SWS.

SWS reserves the right to amend the specification in line with their policies of continual improvement and product development. You should check specification prior to door preparation.

Any revision or alterations to requirements should be notified immediately to SWS and floor plans and door schedules submitted to SWS's address.

Normal door thickness of 44mm is assumed (Unless Indicated). Should any other door size be used certain items may have to be adjusted to accommodate this.

Whilst every care has been taken in preparing this schedule to interpret your requirements correctly, we suggest that you check it carefully for errors or omissions.

E & O E

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Set Listing

Project: Trewirgie Junior School, Redruth

Ref : 002683
Date : 12/09/19
Revision : 0

Set	Description	Qty
01	-	1
02	-	2
03	-	3
04	Disabled WC	1
05	-	2

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Detailed Door Listing

Project: Trewirgie Junior School, Redruth

Ref : 002683
Date : 12/09/19
Revision : 0

Door	Description	UMK	Set	Qty
D001	-		01	1
D002	-		02	1
D003	-		02	1
D004	-		03	1
D005	-		04	1
D006	-		03	1
D007	-		03	1
D008	-		05	1
D009	-		05	1

Total number of Doors : 9

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Project: Trewirgie Junior School, Redruth

Ref : 002683
Date : 12/09/19
Revision : 0

Hardware Set 01

Code No	Product	Qty	Per
2220.13.SSS	SSS Ball Bearing Butt Hinges, 102 x 76mm, Grade 13	1.5	Pair
2405.02.SSS	Euro Profile Deadlock Case, 60mm b/s, SSS	1	Each
EC-3010-NP	Single Euro Profile Cylinder, 30/10, NP, To Differ	1	Each
1420.03.SSS	SSS Euro Profile Cylinder Pull	1	Each
3410.21.SSS	SSS Floor Mounted Door Stop	1	Each
2670.03.SSS	SSS 'Fire Door Keep Locked' Sign, 76mm dia	1	Each
ZID6030	Intumescent Lock Wrap to suit DIN style lockcases.	1	Each
ZIH30	Intumescent Hinge Pads to suit a pair of hinges	1.5	Pack

SET COMMENTS

-

DOORS :

D001

TOTAL No. SETS: 1

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Ref : 002683
Date : 12/09/19
Revision : 0

Hardware Set 02

Code No	Product	Qty	Per
2220.13.SSS	SSS Ball Bearing Butt Hinges, 102 x 76mm, Grade 13	1.5	Pair
2405.03.SSS	Mortice Latch, 60mm b/s, SSS	1	Each
1040.19.02.SSS	SSS Safety Levers on Sprung Roses, BSEN1906 - FD30/60	1	Pair
3410.21.SSS	SSS Floor Mounted Door Stop	1	Each
FL4251.SNP	Heavy Duty Slimline Overhead Door Closer with Backcheck & elayed Action, SS Finish Semi Radiused Cover & Matching Arm, Adjustable Power Size 2-5, CE Marked, Tested to BS EN 1154 and BS EN1634. BS8300/Doc M (DDA)	1	Each
2670.02.SSS	SSS 'Fire Door Keep Shut' Sign, 76mm dia	1.5	Each
ZID6030	Intumescent Lock Wrap to suit DIN style lockcases.	1	Each
ZIH30	Intumescent Hinge Pads to suit a pair of hinges	1.5	Pack

SET COMMENTS

-

DOORS :

D002 D003

TOTAL No. SETS: 2

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Project: Trewirgie Junior School, Redruth

Ref : 002683
Date : 12/09/19
Revision : 0

Hardware Set 03

Code No	Product	Qty	Per
2220.13.SSS	SSS Ball Bearing Butt Hinges, 102 x 76mm, Grade 13	1.5	Pair
2405.04.SSS	Bathroom Lock, 78mm c/c, 60mm b/s, SSS	1	Each
1040.19.02.SSS	SSS Safety Levers on Sprung Roses, BSEN1906 - FD30/60	1	Pair
1405.16.SSS	SSS Accessible WC Turn & Release, 52 x 8mm	1	Each
3410.21.SSS	SSS Floor Mounted Door Stop	1	Each
FL4251.SNP	Heavy Duty Slimline Overhead Door Closer with Backcheck & elayed Action, SS Finish Semi Radiused Cover & Matching Arm, Adjustable Power Size 2-5, CE Marked, Tested to BS EN 1154 and BS EN1634. BS8300/Doc M (DDA)	1	Each
#22	Door Closers to be set on lowest power setting.		

SET COMMENTS

-

DOORS :

D004 D006 D007

TOTAL No. SETS: 3

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Ref : 002683
Date : 12/09/19
Revision : 0

Hardware Set 04

Code No	Product	Qty	Per
2220.13.SSS	SSS Ball Bearing Butt Hinges, 102 x 76mm, Grade 13	1.5	Pair
2405.04.SSS	Bathroom Lock, 78mm c/c, 60mm b/s, SSS	1	Each
1040.19.02.SSS	SSS Safety Levers on Sprung Roses, BSEN1906 - FD30/60	1	Pair
1405.16.SSS	SSS Accessible WC Turn & Release, 52 x 8mm	1	Each
FL4251.SNP	Heavy Duty Slimline Overhead Door Closer with Backcheck & elayed Action, SS Finish Semi Radiused Cover & Matching Arm, Adjustable Power Size 2-5, CE Marked, Tested to BS EN 1154 and BS EN1634. BS8300/Doc M (DDA)	1	Each
3645.06.SSS	SSS Disabled Symbol, 76mm dia	1	Each
#22	Door Closers to be set on lowest power setting.		

SET COMMENTS
Disabled WC

DOORS :
D005

TOTAL No. SETS: 1

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Ref : 002683
Date : 12/09/19
Revision : 0

Hardware Set 05

Code No	Product	Qty	Per
2220.13.SSS	SSS Ball Bearing Butt Hinges, 102 x 76mm, Grade 13	1.5	Pair
2405.01.SSS	Euro Profile Sashlock Case, 72mm c/c, 60mm b/s, SSS	1	Each
EC-3535T-NP	Euro Cylinder & Turn, 35/35T, NP, To Differ	1	Each
1040.19.02.SSS	SSS Safety Levers on Sprung Roses, BSEN1906 - FD30/60	1	Pair
1405.13.SSS	SSS Euro Profile Escutcheons, 52 x 8mm	2	Each
3410.21.SSS	SSS Floor Mounted Door Stop	1	Each
FL4251.SNP	Heavy Duty Slimline Overhead Door Closer with Backcheck & elayed Action, SS Finish Semi Radiused Cover & Matching Arm, Adjustable Power Size 2-5, CE Marked, Tested to BS EN 1154 and BS EN1634. BS8300/Doc M (DDA)	1	Each
2670.02.SSS	SSS 'Fire Door Keep Shut' Sign, 76mm dia	2	Each
ZID6030	Intumescent Lock Wrap to suit DIN style lockcases.	1	Each
ZIH30	Intumescent Hinge Pads to suit a pair of hinges	1.5	Pack

SET COMMENTS

-

DOORS :

D008 D009

TOTAL No. SETS: 2

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Project: Trewirgie Junior School, Redruth

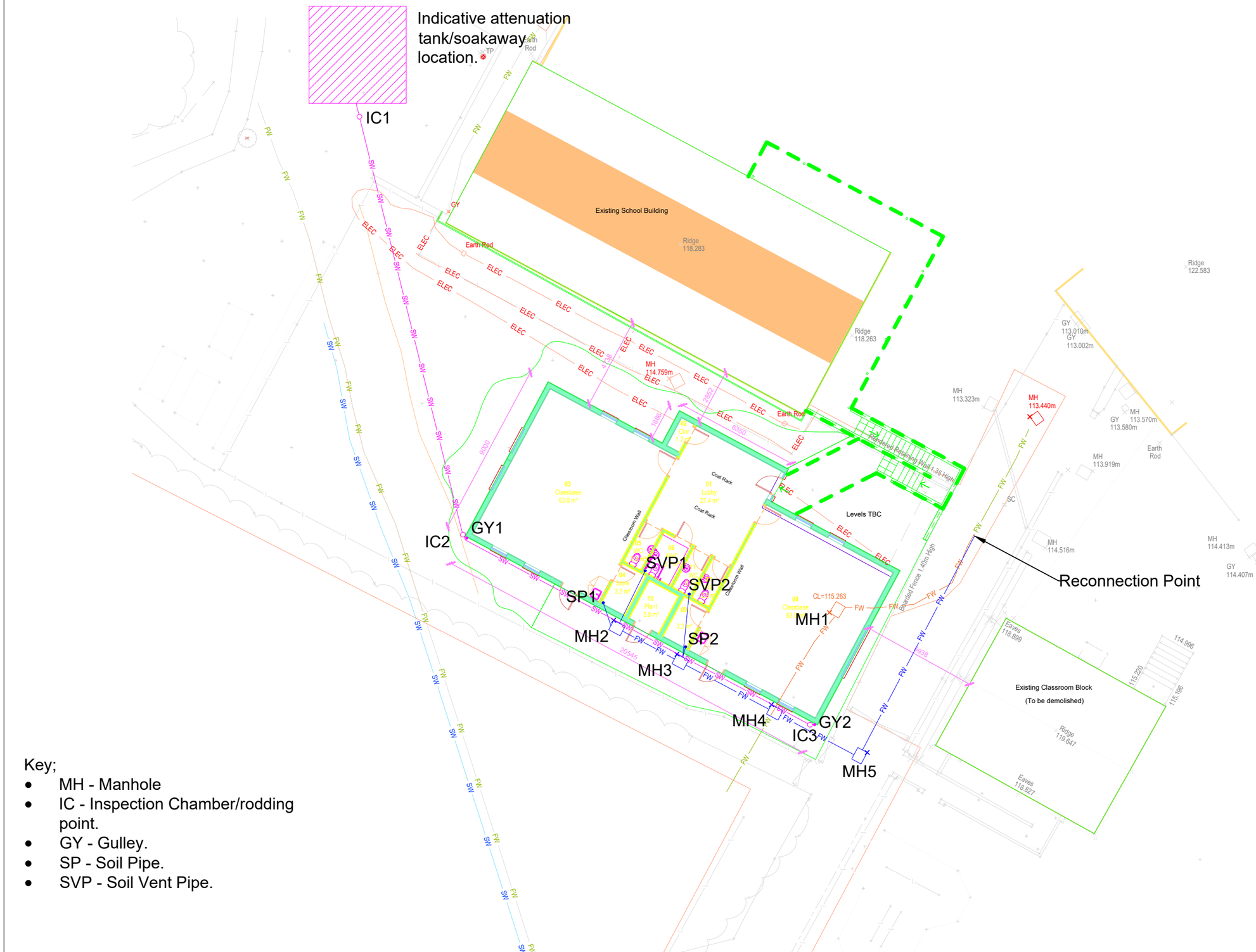
Ref : 002683
Date : 12/09/19
Revision : 0

SCHEDULE CONTENTS

SWS , Waterside, Collett Way, Brunel Industrial Estate, NEWTON ABBOT, Devon TQ12 4PH
Tel: 01626 333900 Fax: 01626 324297 E-mail: sales@sws-eu.com

Appendix M. Proposed Drainage Alteration Layout

- 5188434-TR152QN-BS-UG-01 – Drainage Alteration and Connection; Indicative Layout.
- PA19/05931 – Cornwall Council Planning Pre-Commencement Condition Notice.
- Flood Risk Assessment



Key;

- MH - Manhole
- IC - Inspection Chamber/rodding point.
- GY - Gulley.
- SP - Soil Pipe.
- SVP - Soil Vent Pipe.

P:\GBEXD\F and G - South West\Projects\5188434 - Trewirgie JS\A2 - Project Management\700 - Design Information\740 - Drawings\Drainage\Drainage Layout Proposed.dwg

DO NOT SCALE

Use only written dimension. All dimension must be verified prior to works being put into hand and any discrepancies reported to the originator.

Health and Safety Information

	Details	Sign	Date
Asbestos Survey			
Structural Check/Lifting & Handling			
Site Survey			
Access and Egress/Site Compound			
Hazards Identified			

General Notes

- Indicative layout drawing for foul and surface drainage water runs.
- Refer to Oatway above ground drainage information drawing (P1208-M(52/52)100).
- Surface water drainage dispersal pending planning determination, indicative soakaway location only.
- Drainage to be OSMADrain of diameter to match existing connections.
- Invert levels to new connections to be set to achieve 1:80 falls to existing drainage connections.
- Existing drainage run from MH4 to Reconnection Point (highlighted orange) to be removed and backfilled with compacted type 1 aggregate or grouted as appropriate.
- Inspection chambers to be selected depending on required invert level.

REV	Details of Revision	Date	Sign

Client

FAITHFUL+GOULD

The Octagon, 2nd Floor, Pynes Hill Court, Rydon Lane, Exeter, EX2 5AZ

Tel: +44(0)1392 813100
Fax: +44(0)1392 352999

Project

Trewirgie Junior Schoool, Falmouth Rd, Redruth, TR15 2QN

Title

Drainage Alteration and Connection Indicative Layout

Drawing No			
5188434-TR152QN-BS-UG-01			
Scale	Drawn	Checked	Co-ord chk
1:200 @A3	ST	TU	
Drawing size	Date	Date	Date
A3	11/09/19	11/09/19	

Status

INFORMATION

Thompson, Simon

From: England Hannah <Hannah.England@cornwall.gov.uk>
Sent: 12 September 2019 12:38
To: Thompson, Simon
Subject: PA19/05931 Trewirgie Junior School

Information Classification: CONTROLLED

Dear Simon,

I apologies for the slight delay in receiving the below comments.

The Lead Local Flood Authority (LLFA) comments with regard to the application below are as follows.

Flood Zones: The proposed development sits within Flood Zone 1 based on the Environment Agency maps.

Flood Risk Assessment: The site area is less than 1ha and the site is within a Critical Drainage Area. A Flood Risk Assessment (FRA) has been provided.

Critical Drainage Area: The proposed site is within the Camborne, Pool, Illogan and Redruth (CPIR) Critical Drainage Area (CDA), identified by the Environment Agency.:

'On site all surface water should be safely managed up to the 1 in 100 year plus climate change conditions.

Surface water from new development should not be routed into a combined sewer as capacity in this system is required for new foul water connections. Additional surface water in the combined drainage system can adversely affect water quality and contribute to failure of Water Framework Directive objectives and negatively impact bathing water quality.'

Cornwall Council reserves the right to apply stricter regulation within Critical Drainage Areas and locations of known flood risk and drainage issues, than those suggested by The SuDS Manual C753. This is to ensure that development has a positive, rather than just neutral, impact on flood risk.

The Councils requirement in relation to surface water drainage systems are that surface water runoff should be managed on the site where possible to prevent potential flooding issues elsewhere. The applicant should submit details of a sustainable surface water drainage scheme for the site designed to the following standard:

1. Infiltration systems are not preferred within this CDA. Infiltration will only be considered if it proven that it is unviable to drain to a watercourse or surface water sewer.
2. Surface water from new development should not be routed into a combined sewer as capacity in this system is required for new foul water connections.
3. Surface water within the site must be managed up to the 1 in 100 year critical duration event plus a minimum allowance of 40% for climate change.
4. Surface water can be attenuated in oversized pipes or attenuation tanks designed to cater for the 1 in 100 year peak rainfall event plus a minimum climate change allowance of 40%. Surface water discharges from development should be no greater than 1 l/sec and flow to a watercourse or surface water sewer.

5. Overland flood flow routes must be considered at the design phase. A plan indicating exceedance routes is required and this must indicate the routes and likely impacts of overland flows on adjacent development sites, property, infrastructure and highways. Consideration must be given to historic, known flood flow routes and flood related issues and these issues should be mitigated. Designers must consider how these flows will be managed within the development and provided details of management features e.g. dropped or raised kerbs, detention areas etc.
6. All development must aim to reduce current rainfall runoff rates including brownfield sites which must also match the same standards.

Greenfield Runoff Rate: We will accept Greenfield Runoff Rates (GFR) based on the IH124 method as this provides lower more conservative rates.
Attenuation Tanks: The applicant should consider the following in relation to attenuation tanks:
1. Attenuation systems come in many forms but the most common are geocellular tanks, oversized plastic pipes, oversized concrete pipes, precast or in situ cast concrete box culvert sections. These types are acceptable in Cornwall.
2. Tank floatation must be considered and calculations may be required.
3. Attenuation tanks must be designed with suitable upstream pre-treatment systems to capture sediment and debris.
4. Exceedance flow routes from the attenuation systems must be considered and managed through design and integrated in the site where possible.
5. Details relating to headwall construction and the provision for flow control devices must be provided.
6. Consent could be required for works adjacent to or over the watercourse along with discharge consent to the watercourse.

Soakaways and infiltration systems: The applicant should consider the following in relation to soakaways/infiltration features:

1. A safety factor of between 1.5 and 5 should be applied for all soakaways and infiltration systems depending on the consequence of failure;
2. Soakaways should be sited least 5m from any built structure in order to comply with Building Regulations Part H;
3. Where possible there should be a 5m separation distance from any adjacent soakaway or infiltration system;
4. Infiltration systems should be sited at least 3m distance from any adjacent adopted highway;
5. Soakaways must not be sited adjacent to retaining structures;
6. The location of existing and/or proposed trees must be considered to ensure that soakaways are not sited within the root protection area;
7. Silt traps must be installed on all soakaway inlets. Soakaway must have and appropriate number of inspection chambers fitted.

Contaminated Land: Consideration must be given to the proximity of any contaminated land close to the proposed sites of infiltration systems. Care must be taken to ensure that contaminants are not mobilised as a result of the construction and operation of soakaways and other infiltration systems. If infiltration systems are proposed in locations where land remediation is to be undertaken, percolation tests must be undertaken again once remediation works have been completed. Infiltration systems must then be designed using data which reflects the post remediation ground conditions.
Construction Phase Surface Water Management: A Construction Phase Surface Water Management Plan is required. This should provide details of how surface water is to be managed throughout the construction phases of the development. Consideration should be given to the management of runoff from the site and the effects of silt and surface water on land, property, watercourses and the highway throughout the development.

Management and Maintenance: Details of the proposed surface water drainage management and maintenance regime must be provided along with a schedule and plan indicating the extent of the drainage assets managed and those to be conveyed to private owners.

Based on the details provided I feel that the outstanding information can be provided via a prior to commencement condition and suggest the following:

Condition: "No development approved by this permission shall be commenced until details of a scheme for the provision of surface water management and foul water treatment has been submitted to and approved in writing by the Local Planning Authority. The details shall include:-

1. A description of the foul and surface water drainage systems operation;
2. Details of the final drainage schemes including calculations and layout;
3. A Construction Surface Water Management Plan;
4. A Construction Quality Control Plan;
5. A plan indicating the provisions for exceedance pathways, overland flow routes and proposed detention features;
6. A timetable of construction;
7. Confirmation of who will maintain the drainage systems and a plan for the future maintenance and management, including responsibilities for the drainage systems and overland flow routes.

Thereafter, the approved scheme shall be implemented in accordance with the details and timetable so agreed and the scheme shall be managed and maintained in accordance with the approved details for the lifetime of the development. Details of the maintenance schedule shall be kept up to date and be made available to the Local Planning Authority within 28 days of the receipt of a written request.

Reason: To prevent the increased risk of flooding and minimise the risk of pollution of surface water by ensuring the provision of a satisfactory means of surface water control and disposal."

In light of the above, please confirm whether you are happy to accept the pre-commencement condition recommended above or whether you like to extend the time of the application to provide these requested details.

Kind regards,

Hannah England

Development Officer - Area 2
Planning and Sustainable Development
Economic Growth & Development
Cornwall Council

Tel: (01209) 615655

ambiental®

predicting · preventing · protecting

Project:	Phase 1 Flood Risk Assessment (FRA)
Prepared for:	Faithful and Gould
Reference:	4756
Date:	July 2019
Version:	Final v1.0

Document Issue Record

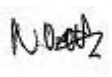
Project: Phase 1 Flood Risk Assessment

Prepared for: Faithful and Gould

Reference: 4756

Site Location: Trewirgie Junior School, Falmouth Road, Redruth, TR15 2QN

Proposed Development: It is understood that the development is for the construction of a single storey double classroom block to provide additional space to the existing Junior School.

Consultant		Date	Signature
Author(s)	Nick Drewett	25/07/2019	
Document Check	Thea Powell	29/07/2019	
Authorisation	Steven Brown	31/07/2019	

Please Note:

Contact Us:

Ambiental Environmental Assessment Ltd.
Science Park Square
Brighton, BN1 9SB
www.ambiental.co.uk
UK Office: +44 (0) 20 3857 8530 or 020 3857 8540

Contents

1. Summary

1.1 Ambiental Environmental Assessment Limited has been appointed by Faithful and Gould to undertake a National Planning Policy Framework (NPPF) compliant Flood Risk Assessment (FRA) for the proposed development at Trewirgie Junior School, Falmouth Road, Redruth, TR15 2QN.

1.2 It is understood that the development is for the construction of a single storey double classroom block to provide additional space to the existing Junior School.

1.3 The EA Flood Map for Planning indicates that the northeast boundary of the Trewirgie Junior School complex, fronting onto Falmouth Road, is in Flood Zone 3. However, the majority of the site, including the redline application boundary associated with the new classroom application, is in Flood Zone 1. The redline application boundary and proposed classroom block are located approximately 66m from Flood Zone 3. In addition, the proposed classroom block will be located on land approximately 8m above the topographic levels at the edge of Flood Zone 3.

1.4 The proposed development is considered to be a 'More Vulnerable' development under the NPPF.

1.5 The site is however located in the Camborne, Pool, Illogan and Redruth (CPIR) Critical Drainage Area (CDA) as defined by the EA. As such a flood risk assessment is required to support the application.

1.6 The EA flood map for planning shows the proposed classroom block to be entirely located outside of the 1:100 year flood extent (Flood Zone 3) and the 1:1000 year flood extent (Flood Zone 2). As such the risk of fluvial flooding to the site could be considered low.

1.7 The EA Risk of Flooding from Surface Water (RoFSW) dataset indicates that the proposed classrooms and associated redline application boundary would remain unaffected in the 1:1000 year pluvial event. Parts of the wider Junior School complex could be affected in this event including Falmouth Road. However, the proposed classroom development could be considered a Minor Development as an extension of the existing educational facility (<250m^2) and therefore access/ egress procedures would remain unchanged. For reference, pluvial hazard ratings on Falmouth Road should allow safe access/ egress from the site, provided evacuees remain on the higher footway rather than the road.

1.8 The client has stated that they are seeking to manage the roof runoff from the proposed classroom building via soakaway. As such, Ambiental have undertaken initial soakaway calculations based on measured infiltration rates acquired by the client. Based on the worst case measured infiltration rate (2.33x10^{-5} m/s), the runoff from the new roof area could be managed in a geocellular crate soakaway of 2.8x2.4x2.2m, without flooding in the 1:100 year +CC (40%) event.

1.9 However, the Environment Agency statement for the CPIR CDA states that:

Infiltration drainage is not the preferred drainage option in this catchment because of the presence of mine workings and contaminated land. Clean surface water entering mine systems can contribute to contaminated water from mines polluting downstream watercourse…If it is

deemed unviable to drain to a watercourse or surface water sewer draining surface water by infiltration can then be assessed.

1.10 As such, given the potential for contamination, infiltration SuDS may not be appropriate on the site. The client has advised that runoff from the wider site is drained via an attenuation tank system (with the eventual outfall location unknown at the time of writing). As such, given the potential issues with infiltration, Ambiental have also undertaken initial runoff calculations, assuming that runoff from the new roof area can be routed through an attenuation tank and discharged to the existing surface water drainage network at greenfield rates.

1.11 Initial calculations indicate that the greenfield runoff rate associated with the equivalent hardstanding roof area is 0.1 l/s. Restricting runoff rates to less than 1 l/s with current technology could increase the risk of blockage of the system which could lead to flooding on site. As such, 1l/s is typically considered an appropriate minimum restricted flow rate. As such, Ambiental have undertaken initial attenuation storage volume calculations assuming no infiltration and restricting runoff from the proposed roof area to 1 l/s. This indicates a potential storage requirement of 6.7m^3 for the 1:100 year +CC (40%) critical storm event, which could be accommodated in a tank sized 1.6x2x2.4m, prior to discharging to the existing network at a restricted rate of 1 l/s.

1.12 As such and given that:

- the proposed classroom building and redline application boundary are located in Flood Zone 1;
- the proposed classroom building and redline application boundary are location outside the 1:1000 year pluvial flood extent based on the EA RoFSW data;
- the proposed development could be considered a Minor Development as an extension of the existing education facility (<250m^2);

following the guidelines contained within NPPF, the proposed development type could be considered suitable assuming appropriate mitigation can be maintained for its lifetime.

Development Description	Existing	Proposed
Development Type:	Junior School	Construction of single storey double classroom block to provide additional space to the existing Junior School
(Number of Bedrooms):	None	None
EA Vulnerability Classification:	More Vulnerable	More Vulnerable
Ground Floor Level:	Ground levels vary between 114.08mAOD and 115.67mAOD (Source: Topographic survey)	FFLs to be set no lower than existing buildings, recommended 300mm above external ground levels
Level of Sleeping Accommodation:	N/A[1]	N/A[1]
Impermeable Surface Area:	None, redline application boundary is grassed area as existing	Proposed roof area approximately 198m^2; associated footpaths approximately 60m^2 however this could be permeable paving to be self-draining
Surface Water Drainage:	None	Roof runoff to be managed via soakaway if contamination risk is low, or attenuation tank to provide storage when discharging to existing network at 1 l/s
Site Size:	Redline application boundary approximately 571m^2, wider Junior School boundary approximately 11,750m^2	No change
Risk to Development	**Summary**	**Comment**
EA Flood Zone:	1	Wider site is within Flood Zones 2 and 3 also but proposed development in Flood Zone 1
Flood Source:	Pluvial	CDA CPIR
1:100yr Flood Level:	N/A	Site is located in Flood Zone 1 approximately 8m above extent of Flood Zone 3
1 in 100yr Flood Level + Climate Change:	N/A	
1 in 1000yr Flood Level:	N/A	
Recorded Flood Events in Area:	No	No records provided by EA or SFRA
Recorded Flood Events at Site:	No	
SFRA Available:	Yes	Cornwall Strategic Flood Risk Assessment Level 1 (2009)
Management Measures	**Summary**	**Comment**
Ground floor level above extreme flood levels:	Yes	Proposed development in Flood Zone 1 and outside 1:1000 year pluvial event
Safe Access/Egress Route:	Yes	Arrangements should not differ from existing as proposed could be considered Minor Development
Flood Resilient Design:	Yes	Section 7 of this report
Site Drainage Plan:	Yes	Roof runoff to be managed via soakaway if contamination risk is low, or attenuation tank to provide storage when discharging to existing network at 1 l/s
Flood Warning & Evacuation Plan:	N/A[1]	Site is located in Flood Zone 1
Offsite Impacts	**Summary**	**Comment**
Displacement of floodwater:	None	Site in Flood Zone 1 and outside 1:1000 year pluvial extent
Increase in surface runoff generation:	None	Runoff can be attenuated on site prior to infiltration or discharging at restricted rate
Impact on hydraulic performance of channels:	None	N/A[2]

Table 1: Summary of flood risks, impacts and proposed flood mitigation measures.

N/A[1] not required for this assessment; *N/A[2]* data not available.

2. Development Description and Site Area

Proposed Development and Location

2.1 The proposed development site is located at Trewirgie Junior School, Falmouth Road, Redruth, TR15 2QN (Figure 1 and 2). It is understood that the development is for the construction of a single storey double classroom block to provide additional space to the existing Junior School.

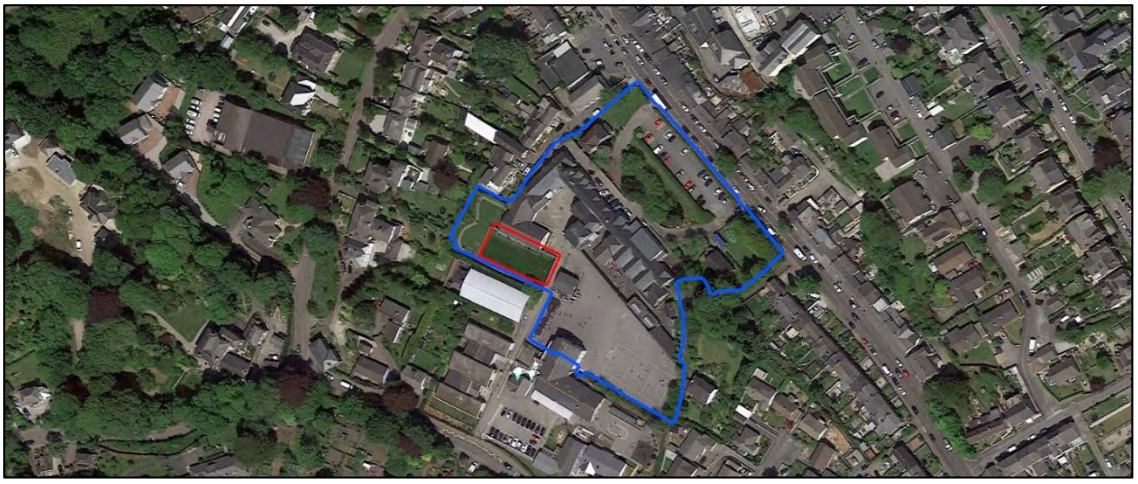


Figure 1: Wider Location Map, Junior School boundary shown as blue, proposed redline application shown as red outline. (Source: Google Earth)

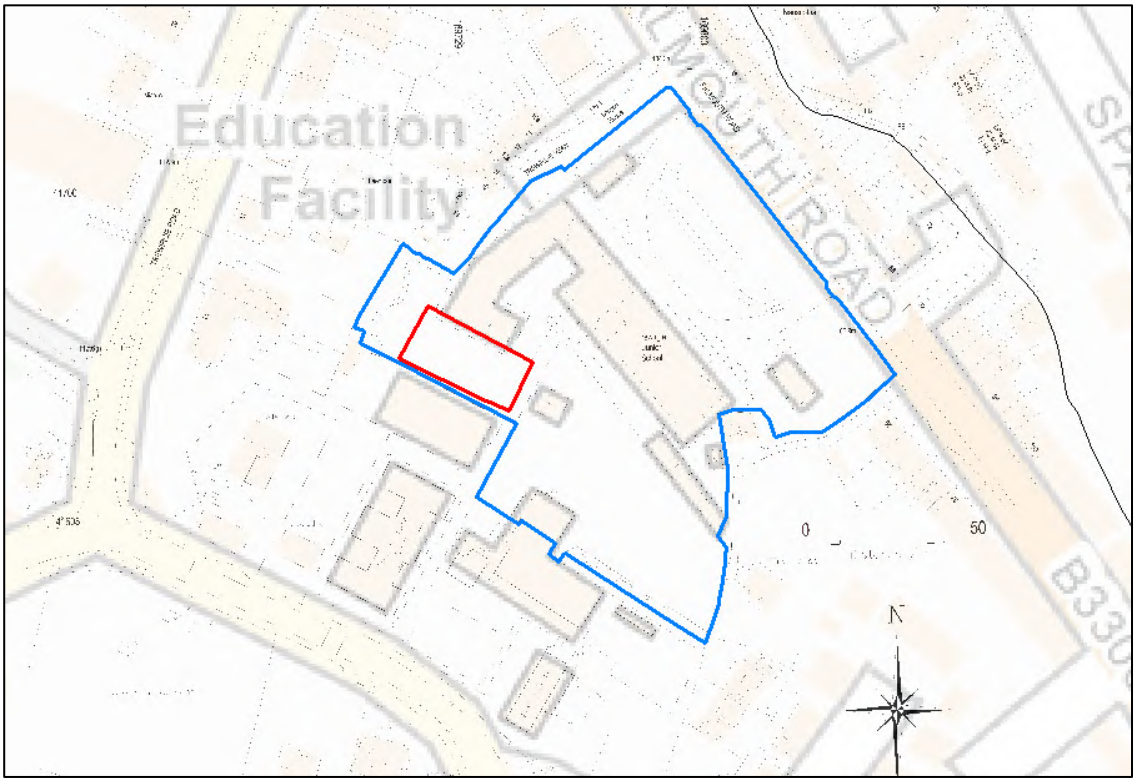


Figure 2: Site Location Map. Junior School boundary shown as blue, proposed redline application shown as red outline. (Source: OS)

2.2 A topographic survey provided by the client indicates that ground levels within the redline application boundary vary between 114.08mAOD and 115.67mAOD. The topographic survey can be found in Appendix A of this report with other proposed site plans.

Vulnerability classification

2.3 The EA Flood Map for Planning (Figure 3) indicates that the northeast boundary of the Trewirgie Junior School complex, fronting onto Falmouth Road, is in Flood Zone 3. However, the majority of the site, including the redline application boundary associated with the two new classrooms application, is in Flood Zone 1. The redline application boundary and proposed classroom block are located approximately 66m from Flood Zone 3. In addition, the proposed classroom block will be located on land approximately 8m above the topographic levels at the edge of Flood Zone 3.

2.4 The proposed development is considered to be a 'More Vulnerable' development under the NPPF.

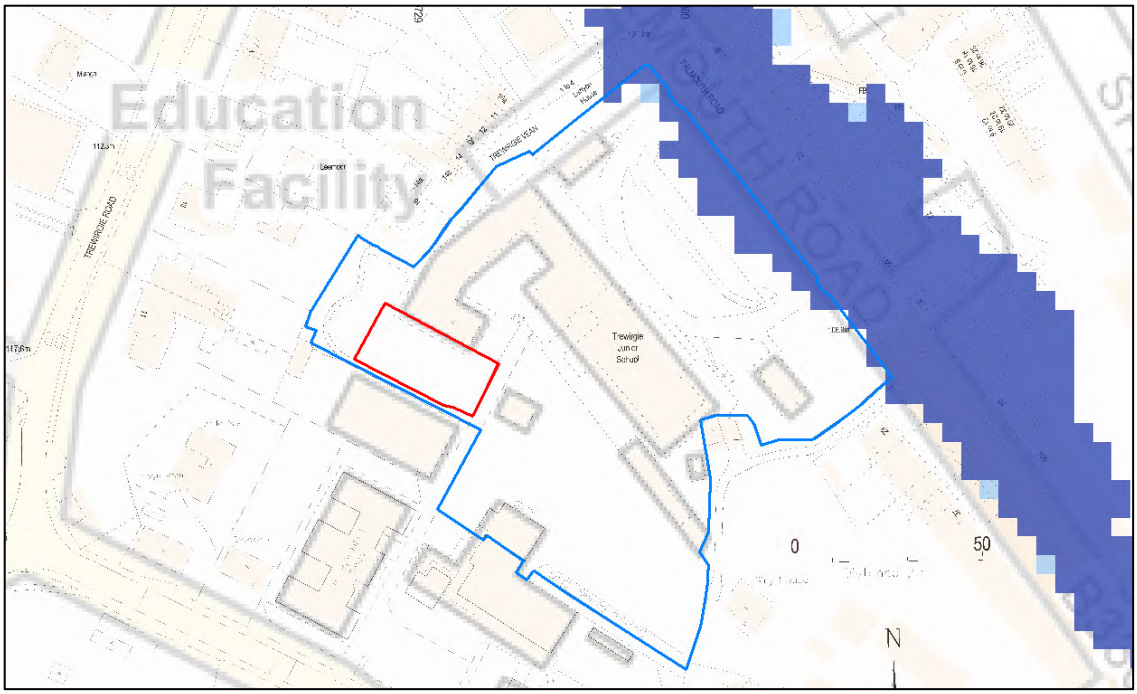


Figure 3: EA Flood Map for Planning. Dark blue indicates Flood Zone 3. Light blue indicates Flood Zone 2 (Sources: EA, OS)

Geology

2.5 The site's bedrock geology has been identified by the British Geological Survey's public mapping model as the Mylor Slate Formation consisting of Hornfelsed Slate and Hornfelsed Siltstone. There are no superficial deposits recorded at the site.

2.6 The EA has identified the site to be located outside of all Groundwater Source Protection Zones and is not located within a Groundwater Vulnerability Zone.

2.8 A ground investigation has been undertaken by Wheal Jane Consultancy. This investigation included infiltration testing at two trial pits. These tests were carried out in accordance with BRE365. The location of the two trial pits are demonstrated in Figure 4 below (TP01 and TP02).

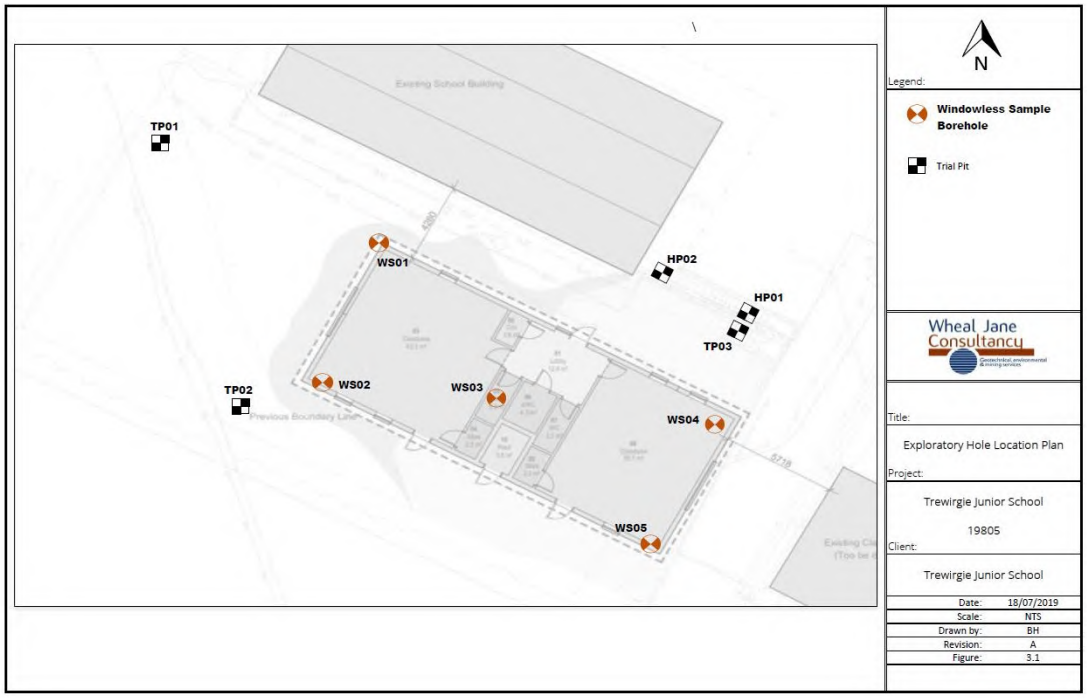


Figure 4: Ground investigation exploratory hole plan (Source: Wheal Jane Consultancy)

2.9 The results of the infiltration tests can be found in Appendix A of this report.

2.10 In summary, the worst recorded infiltration rate at TP01 was 2.33×10^{-5} m/s while the worst recorded rate at TP02 was 2.78×10^{5} m/s.

2.11 The ground investigation report concluded that both trial pit locations were suitable for soakaway drainage. However, Ambiental would note that TP02 is within 5m of the proposed building outline while TP01 is also within 2m of the redline application boundary. There is typically a 5m exclusion zone from building foundations for soakaway infiltration, while previous guidance has stated that soakaways should also be sited more than 2m from site boundaries.

2.12 As such, any soakaway device should be located at least 5m from building foundations and 2m from site boundaries. This would likely require a soakaway device to be located between TP01 and TP02. Infiltration rates should not differ significantly over this 15m distance.

2.13 However, the Environment Agency statement for the CPIR CDA states that:

Infiltration drainage is not the preferred drainage option in this catchment because of the presence of mine workings and contaminated land. Clean surface water entering mine systems can contribute to contaminated water from mines polluting downstream watercourse…If it is deemed unviable to drain to a watercourse or surface water sewer draining surface water by infiltration can then be assessed.

2.14 As such, given the potential for contamination, infiltration SuDS may not be appropriate on the site.

3. Sequential Test/Exception Test

3.1 Under the NPPF, all new planning applications must undergo a *Sequential Test*. This test must be implemented by local planning authorities with a view to locating particularly vulnerable new developments (e.g. residential, hospitals, mobile homes etc.) outside of the floodplain.

3.2 The test refers to the EA Flood Zones described in Table 2. For reference, the NPPF *Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table* is reproduced below:

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	✓	×	Exception Test Required	✓
Zone 3b ***Functional Floodplain***	Exception Test Required	✓	×	×	×

Table 2: The Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table as specified by NPPF. Please note: ✓ means development is appropriate; × means the development should not be permitted.

3.3 The proposed classroom block will be sequentially located on site to Flood Zone 1 and should therefore not require the implementation of the Sequential or Exception Tests.

3.4 The site is however located in the Camborne, Pool, Illogan and Redruth Critical Drainage Area. As such, the planning application is required to be accompanied by a FRA which shows that the development can be achieved in a sustainable manner, with no net increase in flood risk to the site and surrounding area.

4. Site Flood Hazards

Sources of Flooding

4.1 As outlined in Figure 3, the proposed classroom block is to be located within Flood Zone 1 (Low Risk of flooding), and is considered to be 'More Vulnerable' under the NPPF. Communication with the Environment Agency (EA) has identified the following potential sources of flooding to the site:

Source	Description
Fluvial	Redruth Stream
Tidal	N/A
Surface	On site
Groundwater	N/A
Sewer	On site drainage defects

Table 3: Summary of flood sources.

Fluvial

4.2 According to the EA Flood Map for Planning, the probability of fluvial flooding at the proposed classroom building location is less than a 1 in 1000 annual probability of river flooding (<0.1%) as it is located in Flood Zone 1.

4.3 The nearest watercourse to the site is the Redruth Stream, which flows as an open channel on the northeast side of Falmouth Road, approximately 100m northeast of the proposed development at its closest proximity. At this location, the Redruth Stream is an ordinary watercourse, however it does become an EA Main River approximately 700m northwest of the site.

4.4 A topographic survey provided by the client indicates that levels within the redline application boundary vary between 114.08mAOD and 115.67mAOD.

4.5 Based on 2m LiDAR, topographic levels at the edge of Flood Zone 3 on Falmouth Road are approximately 106mAOD (Figure 5). As such, the proposed classroom block will be located on land approximately 8m above the topographic levels at the edge of Flood Zone 3.

Figure 5: Comparison between site topography and elevations of Flood Zone 3 (Sources: EA, OS)

4.6 No records could be found to indicate historic fluvial flooding at the site or immediate vicinity.

4.7 As such, the risk of flooding from fluvial sources could be considered **relatively low**.

Surface Water (Pluvial)

4.8 The site is located in the Camborne, Pool, Illogan and Redruth Critical Drainage Area as defined by the EA (Figure 6).

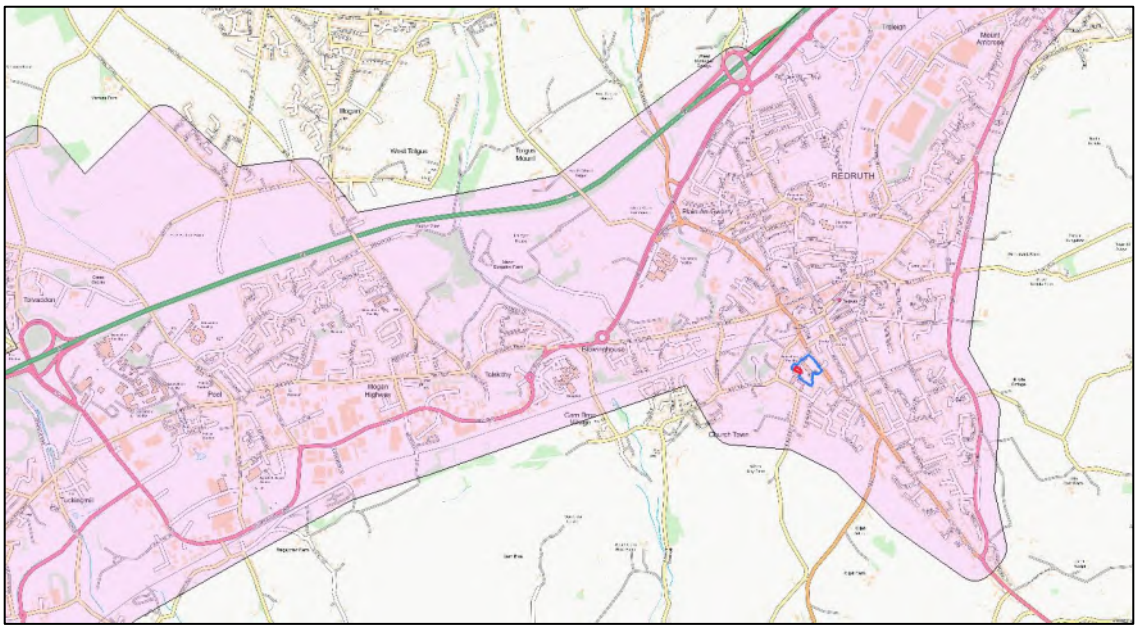


Figure 6: Camborne, Pool, Illogan and Redruth Critical Drainage Area, shown as pink area (Sources: EA, OS)

4.9 Some areas of the wider Junior School complex are at risk of flooding from surface water as defined by the EA Long Term Flood Risk Maps (Figure 7). However, Figure 7 indicates that the redline application boundary and therefore the proposed classroom building are located in an area of 'Very Low' surface water flood risk.

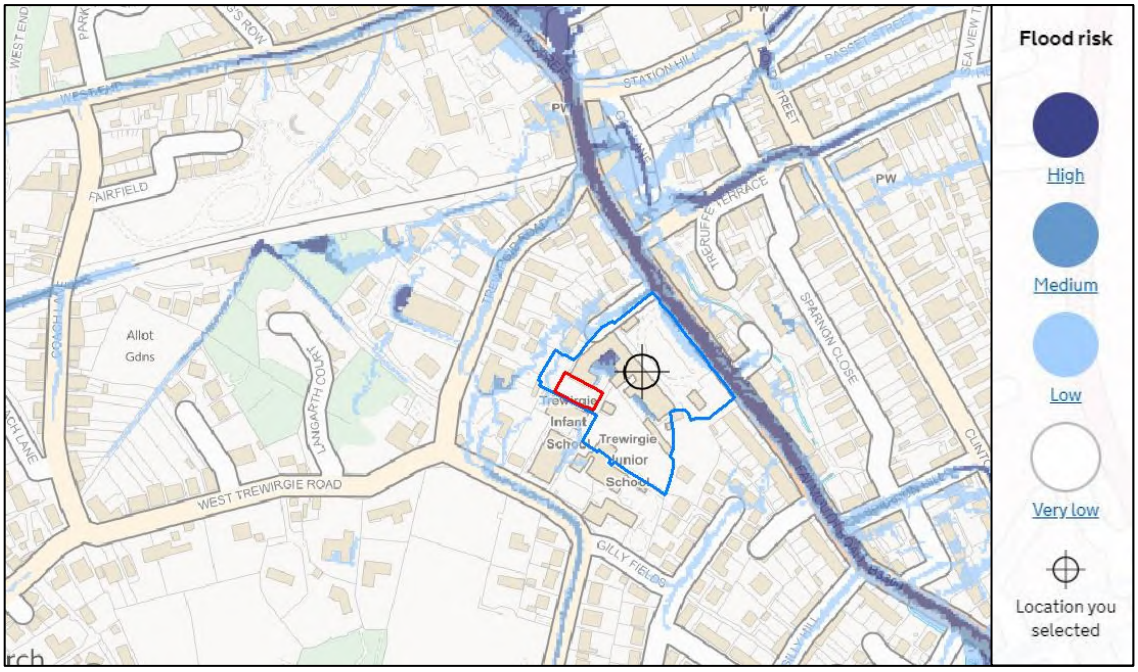


Figure 7: EA Long Term Flood Risk -Surface Water (Source: EA)

4.10 The EA Risk of Flooding from Surface Water (RoFSW) dataset indicates that the proposed classrooms and associated redline application boundary would remain unaffected in the 1:1000 year pluvial event (Figure 8).

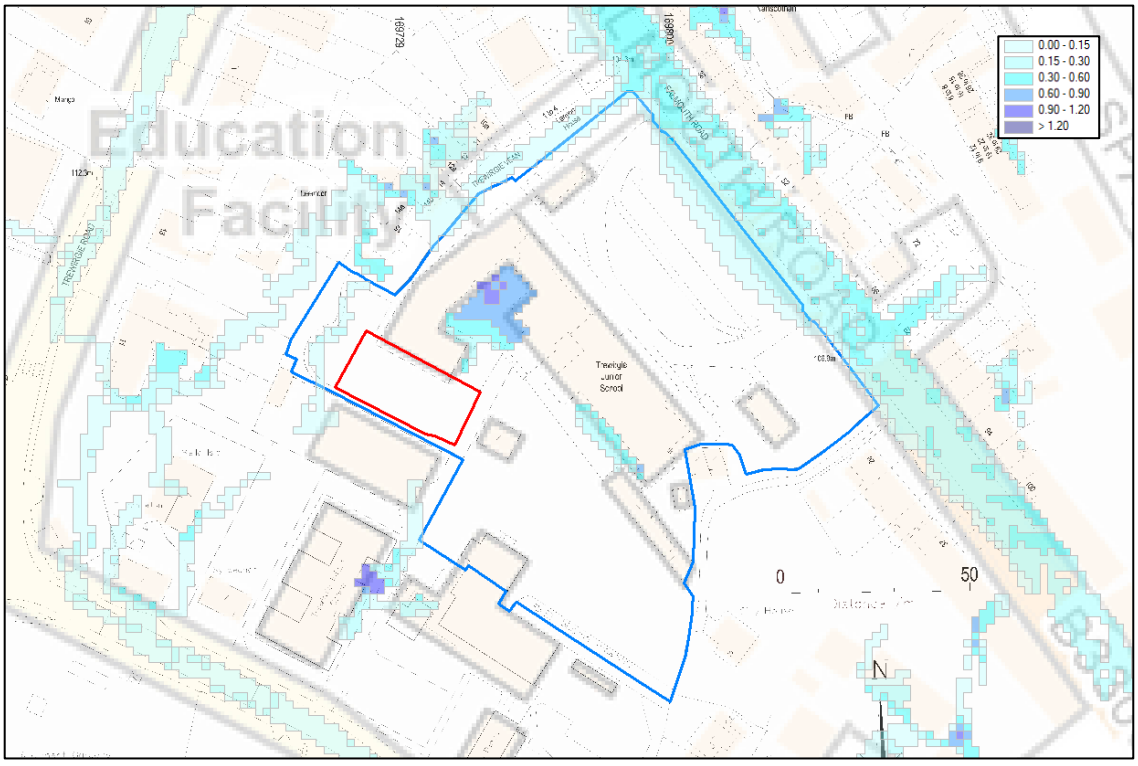


Figure 8: EA RoFSW 1:1000 year flood depths (Sources: EA, OS)

4.11 Parts of the wider Junior School complex could be affected in this event including Falmouth Road. However, the proposed classroom development could be considered a Minor Development as

an extension of the existing educational facility (<250m^2) and therefore access/ egress procedures would remain unchanged.

4.12 For reference, pluvial hazard ratings on Falmouth Road should allow safe access/ egress from the site for the 1:100 year event (Figure 9), provided evacuees remain on the higher footway rather than the road.

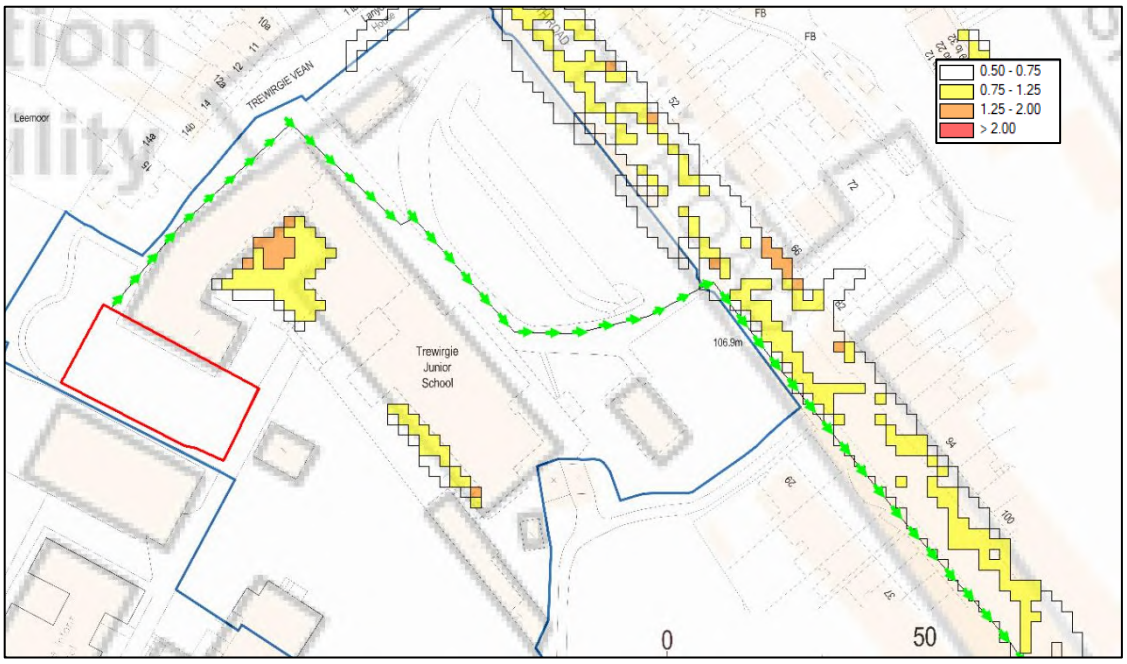


Figure 9: EA RoFSW 1:100 year flood hazard (Sources: EA, OS)

4.13 As such the risk of flooding to the proposed development from this source could be **relatively low**.

Groundwater

4.14 The Cornwall Level 1 SFRA (2009) states that:

Due to its geology Cornwall has only minor aquifers and generally does not experience much groundwater type flooding

4.15 As such, no records could be found to indicate historic groundwater flooding at the proposed development site or surrounding area.

4.16 Based on the available information the risk to the site from this source of flooding could be considered **relatively low**.

Sewer

4.17 The Cornwall Level 1 SFRA (2009) states that in Pool, Camborne and Redruth there are concerns expressed over capacity within the existing sewer network.

4.18 However, no records could be found to indicate historic sewer flooding from public sewers within the vicinity of the site.

4.19 However, with reference to on site sewer systems, Faithful + Gould have advised that:

"there was a surface water flooding event at the Junior School in 2017 which caused extensive internal damage. There's an attenuation tank within the lowest point of the tarmac area with a large depth of water collecting in this area which then overcame the main building (the inflow pipework, tank and outflow pipework was silted/damaged"

4.20 Following this surface water flood event (which was on the wider Junior School complex, not the redline application boundary), PDP Green Consulting were instructed to undertake a CCTV Survey and inspection of the existing drainage system. The CCTV Survey report noted that in general, the onsite surface water drainage was in a fair condition although there were numerous areas of minor displacement. The survey notes that there was approximately 500mm of silt in the existing attenuation tank, along with a number of small holes, which it was stipulated could create a pathway for water from the tank to seep into the surrounding ground.

4.21 PDG Green Consulting subsequently recommended that faults within the surface water drainage system identified during the CCTV survey were address and the silt removed from the system.

4.22 As such the risk of flooding from this source could be deemed **moderate**.

Surface Water Drainage Strategy

4.23 It is understood that the development is for the construction of a single storey double classroom block to provide additional space to the existing Junior School.

4.24 Given the issues of below ground drainage systems experienced on the wider Junior School site, the client has stated that they are seeking to manage the roof runoff from the proposed classroom building via soakaway. The proposed hardstanding/ footpath areas could be Type A Permeable Paving to be self-draining.

4.25 Infiltration should also be considered first when managing runoff in line with the SuDS hierarchy.

4.26 As such, Ambiental have undertaken initial soakaway calculations based on measured infiltration rates acquired by the client. Based on the worst case measured infiltration rate ($2.33x10^{-5}$ m/s, at TP01), the runoff from the new roof area could be managed in a geocellular crate soakaway of 2.8x2.4x2.2m, without flooding in the 1:100 year +CC (40%) event.

4.27 The sizing and location of the soakaway should be confirmed at detailed design stage. Any soakaway device should be located at least 5m from building foundations and 2m from site boundaries. This would likely require a soakaway device to be located between TP01 and TP02. Infiltration rates should not differ significantly over this 15m distance.

4.28 In addition, the client has provided a below ground utility survey which does indicate existing surface water and foul water pipe runs in the southwest corner of the redline boundary located on the west side of TP01 and TP02. As such, consideration should also be shown to the location of these below ground assets when locating new drainage.

4.29 However, the Environment Agency statement for the CPIR CDA states that:

Infiltration drainage is not the preferred drainage option in this catchment because of the presence of mine workings and contaminated land. Clean surface water entering mine systems can contribute to contaminated water from mines polluting downstream watercourse…If it is

deemed unviable to drain to a watercourse or surface water sewer draining surface water by infiltration can then be assessed.

4.30 As such, given the potential for contamination, infiltration SuDS may not be appropriate on the site. Investigations should be undertaken to evidence that infiltration on site would not cause detriment to groundwater resources in the area.

4.31 The client has advised that runoff from the wider site is drained via an attenuation tank system (with the eventual outfall location unknown at the time of writing). As such, given the potential issues with infiltration, Ambiental have also undertaken initial runoff calculations assuming that runoff from the new roof area can be routed through an attenuation tank and discharged to the existing surface water drainage network at greenfield rates.

4.32 Initial calculations indicate that the greenfield runoff rate associated with the equivalent hardstanding roof area is 0.1 l/s.

4.33 Restricting runoff rates to less than 1 l/s with current technology could increase the risk of blockage of the system which could lead to flooding on site. As such, 1 l/s is typically considered an appropriate minimum restricted flow rate.

4.34 As such, Ambiental have undertaken initial attenuation storage volume calculations assuming no infiltration and restricting runoff from the proposed roof area to 1 l/s. This indicates a potential storage requirement of 6.7m^3 for the 1:100 year +CC (40%) critical storm event, which could be accommodated in a tank sized 1.6x2x2.4m, prior to discharging to the existing network at a restricted rate of 1 l/s.

4.35 If infiltration is not considered, the sizing and location of the attenuation system associated with the new building should be confirmed at detailed design stage.

4.36 However, given the previous issues encountered on the wider site with reference to subsidence and the existing attenuation tank, the developer is seeking to utilise a soakaway system for the new building rather than connecting into the existing system.

Records of Historical Flooding

4.37 The SFRA has not identified any flooding incidents from any sources to have affected the site previously.

4.38 The EA has also provided no records of previous flooding incidents from any sources to have occurred at the site in the past.

4.39 The client has advised that there was a surface water flooding event at the Junior School complex in 2017 which caused extensive internal damage to the main building. The extent of flooding in this event is not known. However, a topographic survey provided by the client indicates that levels within the redline application boundary vary between 114.08mAOD and 115.67mAOD, while the main building is at an elevation of approximately 112mAOD. As such, given the elevation difference between the main building and the redline application boundary, it is not envisaged that the proposed development site itself was flooded in this previous flood event. The developer should advise if the redline application did actually flood in this event.

5. Probability of Flooding

5.1 The EA Flood Map for Planning (Figure 3) indicates that the northeast boundary of the Trewirgie Junior School complex, fronting onto Falmouth Road, is in Flood Zone 3. However, the majority of the site, including the redline application boundary associated with the new classrooms application, is in Flood Zone 1.

5.2 Land in Flood Zone 1 has a less than 1 in 1000 (<0.1%) annual probability of fluvial/ tidal flooding.

Zone	Description
1	Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).
2	Medium Probability. This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.
3a	High Probability. This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
3b	The Functional Floodplain. This zone comprises land where water has to flow or be stored in times of flood. SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the EA, including water conveyance routes).

Table 4: Definition of the NPPF Flood Zones (Source: EA)

Climate Change on Site

5.3 Guidance introduced by the EA in February states that 'More Vulnerable' developments in Flood Zone 1 should apply a central allowance for climate change.

5.4 The proposed development site is located within the South West River Basin District. The central allowance for this river basin is 30%. As such, the proposed development should apply a 30% allowance for climate change on the 1:100 year fluvial event.

5.5 At this stage, no site specific modelled flood data has been provided for the site and as such, the impacts of a 30% increase in river flow to account for climate change cannot be fully quantified.

5.6 However, the proposed classroom block will be located on land approximately 8m above the topographic levels at the edge of Flood Zone 3. As such, it could be considered unlikely that a 30% increase in river flow would result in the 1:100 year fluvial event affecting the proposed development.

5.7 It could be considered likely that the proposed classroom block will remain in Flood Zone 1 for its lifetime given the topography of the area.

5.8 The EA have also stated that the climate change will increase the peak rainfall intensity allowance in small and urban catchments. The EA climate change allowances for peak rainfall intensity are shown in Table 5 below. As such the proposed development will be at more risk of surface water flooding in the future.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Table 5: Peak Rainfall Intensity Climate Change Allowances

6. Flood Risk Management Measures

6.1 The proposed development is to be located within Flood Zone 1 according to the EA Flood Map for Planning. The proposed classroom block will be located on land approximately 8m above the topographic levels at the edge of Flood Zone 3. As such, the proposed block will have a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).

6.2 Furthermore, the EA Risk of Flooding from Surface Water (RoFSW) dataset indicates that the proposed classrooms and associated redline application boundary would remain unaffected in the 1:1000 year pluvial flood event.

6.3 The proposed classroom block could be considered a Minor Development as an extension of the existing educational facility, with a footprint of less than 250m^2. As such, it could adhere to the EA Standing Advice for Minor Developments which states that FFLs should be set no lower than those in the existing use.

6.4 However, the proposed block is located on land above the existing main building and as such, the FFLs will be no lower than the existing by default.

6.5 Therefore as to offer betterment to the site and the proposed block, it is recommended that the proposed development incorporate the following mitigation measures:

- Solid (i.e. concrete floors) where possible on the ground floor with waterproof membrane;
- Raise ground floor levels 300mm above the external ground level to mitigate against overland flows/ surface water in extreme or exceedance events;
- Anti-syphon fitted to all toilets;
- Non-return valves to be fitted to all drain and sewer outlets;
- It is also recommended that if not done so already, senior management of the Junior School sign up to the EA Flood Alert Service.

6.6 As the proposed development is for the construction of additional classrooms on an existing school complex, access/ egress arrangements for the proposed development should not differ from the existing arrangements for the wider school complex, particularly as the proposed block will be located in Flood Zone 1, outside the 1:1000 year pluvial flood extent, with a way of accessing the main building outside of the 1:1000 year flood extent.

7. Off Site Impacts

Impact to Flood Risk Elsewhere

7.1 The proposed redline application boundary is located in Flood Zone 1 and outside of the EA modelled 1:1000 year pluvial flood extent. As such, there should be **no displacement of flood waters** and consequently **no need for flood compensatory storage at the site**.

Generation of Runoff

7.2 It is understood that the development is for the construction of a single storey double classroom block to provide additional space to the existing Junior School.

7.3 Given the issues of below ground drainage systems experienced on the wider Junior School site, the client has stated that they are seeking to manage the surface water runoff from the proposed classroom roof via soakaway. Infiltration should also be considered first when managing runoff in line with the SuDS hierarchy.

7.4 As such, Ambiental have undertaken initial soakaway calculations based on measured infiltration rates acquired by the client. Based on the worst case measured infiltration rate ($2.33x10^{-5}$ m/s, at TP01), the runoff from the new roof area could be managed in a geocellular crate soakaway of 2.8x2.4x2.2m, without flooding in the 1:100 year +CC (40%) event.

7.5 The sizing and location of the soakaway should be confirmed at detailed design stage. Any soakaway device should be located at least 5m from building foundations and 2m from site boundaries. This would likely require a soakaway device to be located between TP01 and TP02. Infiltration rates should not differ significantly over this 15m distance.

7.6 However, the Environment Agency statement for the CPIR CDA states that:

Infiltration drainage is not the preferred drainage option in this catchment because of the presence of mine workings and contaminated land. Clean surface water entering mine systems can contribute to contaminated water from mines polluting downstream watercourse…If it is deemed unviable to drain to a watercourse or surface water sewer draining surface water by infiltration can then be assessed.

7.7 As such, given the potential for contamination, infiltration SuDS may not be appropriate on the site. Investigations should be undertaken to evidence that infiltration on site would not cause detriment to the mines in the area.

7.8 The client has advised that runoff from the wider site is drained via an attenuation tank system (with the eventual outfall location unknown at the time of writing). As such, given the potential issues with infiltration, Ambiental have also undertaken initial runoff calculations assuming that runoff from the new roof area can be routed through an attenuation tank and discharged to the existing surface water drainage network at greenfield rates.

7.9 Initial calculations indicate that the greenfield runoff rate associated with the equivalent hardstanding roof area is 0.1 l/s.

7.10 Restricting runoff rates to less than 1 l/s with current technology could increase the risk of blockage of the system which could lead to flooding on site. As such, 1 l/s is typically considered an appropriate minimum restricted flow rate.

7.11 As such, Ambiental have undertaken initial attenuation storage volume calculations assuming no infiltration and restricting runoff from the proposed roof area to 1 l/s. This indicates a potential storage requirement of 6.7m^3 for the 1:100 year +CC (40%) critical storm event, which could be accommodated in a tank sized 1.6x2x2.4m, prior to discharging to the existing network at a restricted rate of 1 l/s.

7.12 If infiltration is not considered, the sizing and location of the attenuation system associated with the new building should be confirmed at detailed design stage.

7.13 However, given the previous issues encountered on the wider site with reference to subsidence and the existing attenuation tank, the developer is seeking to utilise a soakaway system for the new building rather than connecting into the existing system.

8. Residual Risks

Identification of Residual Risks

8.1 Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- failure of a reservoir, or;
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

8.2 The proposed development site is located in Flood Zone 1, outside mapped areas benefitting from the presence of flood defences. As such, the residual risk posed by defence breach/ failure could be considered low.

8.3 The proposed development site is located outside the maximum modelled flood extent following reservoir failure, mapped by the EA.

8.4 As such the only remaining residual flood risk to the development is that of drainage failure. In the event of drainage failure, overland flows would be dictated by on site topography. It is recommended that the thresholds of the proposed classroom block are set 300mm above surrounding ground levels to offer mitigation against overland flows in exceedance events.

8.5 However, given the historic surface water flooding issues on the wider site, it is also recommended that external levels within the proposed redline application boundary be designed to fall towards soft landscaped areas which could provide additional attenuation of runoff in exceedance events.

9. Conclusion

9.1 Ambiental Environmental Assessment Limited has been appointed by Faithful and Gould to undertake a National Planning Policy Framework (NPPF) compliant Flood Risk Assessment (FRA) for the proposed development is for an extension to the exiting nursery and to provide a multi-purpose hall extension to the existing parent building.

9.2 The proposed development is located at Trewirgie Infants and Nursery School, Trewirgie Road, Redruth, Cornwall, TR15 2SZ.

9.3 With reference to the NPPF and the Environment Agency (EA) standing advice on development and flood risk, as well as the low detail, national-scale flood mapping created on behalf of the EA, the proposed development is located within Flood Zone 1, (Low Risk; <0.1% annual tidal/fluvial flooding). The site is considered to be a 'More Vulnerable' development under the NPPF.

9.4 The site is however located in the Camborne, Pool, Illogan and Redruth Critical Drainage Area as defined by the EA and the application site area is greater than 1ha. As such this flood risk assessment is required to support the application.

9.5 The EA flood map for planning shows the site to be entirely located outside of the 1:100 year flood extent and the 1:1000 year flood extent. As such the risk of fluvial flooding to the site can be considered **not significant**.

9.6 Initial measurements indicate that impermeable surface area will increase post-development by approximately 233m^2.The proposed runoff rate for the site post development for the 6 hour storm event of a 1:100 +CC return period is 3.61l/s. An increase of 0.96 l/s runoff from the site post development. Given the limited increase in run off post development it is proposed that the runoff shall be managed by the existing drainage network.

9.7 The Red River is located approximately 153m west of the site application boundary.

9.8 As such and given that:

- all built structures will be built entirely within Flood Zone 1;
- the proposed development is for an extension of the existing use, and;
- ground floor levels recommended to be raised 300mm above external ground levels to mitigate against surface water or set no lower than existing parent building floor level in accordance with EA FRSA,

following the guidelines contained within NPPF, the proposed development type is considered **to be suitable** assuming appropriate mitigation can be maintained for its lifetime.

Appendix A – Supporting Information

Notes:

N

Datum Reference = Ordnance

Building Survey Legend

Building Line
Barge Board
Ground
Steps
Rain Water Pipe
Windows
Beams
Pipes
Roof
Kitchen
Ventilation
Bathroom
Storage
Heating

Floor To Sill Height	F/S 0.87	Floor Level	FL 50.00
Floor To Head Height	F/H 2.05	Ground Level	GL 52.00
Door Head Height	DH 2.05	Beam Height	BH: 2.20
Room Area	Area: 9.04	Structural Ceiling Height	SCH 2.27

Topographical Survey Legend

Banks Top
Banks Bottom
Road Centre
Kerb Line
Contour Line Major 50.00
Contour Line Minor 50.50
Fence Line
Wall
Hard edge
Soft Edge
Vegetation

BT	British Telecom	Spot Level	× 50.00
CATV	Cable Tv		
EP	Electricity Pole	Gate	
ER	Earth Rod		
FH	Fire Hydrant	Building	
FP	Flag Pole		
GAS	Gas Cover		
GY	Gully	Tree	
IC	Inspection Cover		
LP	Lamp Post		
MH	Manhole		
MKR	Marker		
RE	Rodding Eye	Station Marker	
RWP	Rain Water Pipe		
SC	Stop Cock		
SVP	Soil Vent Pipe		
TK	Top Of Kerb		
TWL	Top Of Wall	Bore Hole	Bore Hole
TP	Telegraph Pole		
WAT	Water Cover	Trial Hole	Trial Hole

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Surveying & Site Engineering

LAND & TOPOGRAPHICAL SURVEYING - MEASURED BUILDING - LASER SCANNING - 3D COLOURED POINT CLOUDS - UTILITY DETECTION & MAPPING - SITE ENGINEERING/SETTING OUT - ENGINEERING SURVEY - MACHINE CONTROL

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Client:
Faithful & Gould

Project:
Trewirgie Junior School
Redruth

Title:
Topographical Survey

Date: 05.04.2019	Scale 1:200@A1	Cad Ref:
Surveyor: ADS/BL	Drawn: ADS	Checked: ADS
Job/Dwg No: 0419-1039-001		Rev -

1:200
4m 0 4m 8m 12m 16m 20m

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Notes:

N

Datum Reference = Ordnance

Building Survey Legend

Building Line
Barge Board
Ground
Steps
Rain Water Pipe
Windows
Beams
Pipes
Roof
Kitchen
Ventilation
Bathroom
Storage
Heating

Floor To Sill Height	F/S 0.87	Floor Level	FL 50.00
Floor To Head Height	F/H 2.05	Ground Level	GL 52.00
Door Head Height	DH 2.05	Beam Height	BH: 2.20
Room Area	Area: 9.04	Structural Ceiling Height	SCH 2.27

Topographical Survey Legend

Banks Top
Banks Bottom
Road Centre
Kerb Line
Contour Line Major — 50.00
Contour Line Minor — 50.50
Fence Line
Wall
Hard edge
Soft Edge
Vegetation

BT	British Telecom	Spot Level	× 50.00
CATV	Cable Tv	Gate	
EP	Electricity Pole		
ER	Earth Rod	Building	
FH	Fire Hydrant		
FP	Flag Pole		
GAS	Gas Cover		
GY	Gully	Tree	
IC	Inspection Cover		
LP	Lamp Post		
MH	Manhole		
MKR	Marker		
RE	Rodding Eye	Station Marker	
RWP	Rain Water Pipe		
SC	Stop Cock		
SVP	Soil Vent Pipe		
TK	Top Of Kerb		
TWL	Top Of Wall	Bore Hole	Bore Hole
TP	Telegraph Pole		
WAT	Water Cover	Trial Hole	Trial Hole

measura
Surveying & Site Engineering

LAND & TOPOGRAPHICAL SURVEYING - MEASURED BUILDING - LASER SCANNING - 3D COLOURED POINT CLOUDS - UTILITY DETECTION & MAPPING - SITE ENGINEERING/SETTING OUT - ENGINEERING SURVEY - MACHINE CONTROL

94 FORE STREET
BODMIN
CORNWALL
PL31 2HR
01208 74660
office@measura.co.uk
www.measura.co.uk

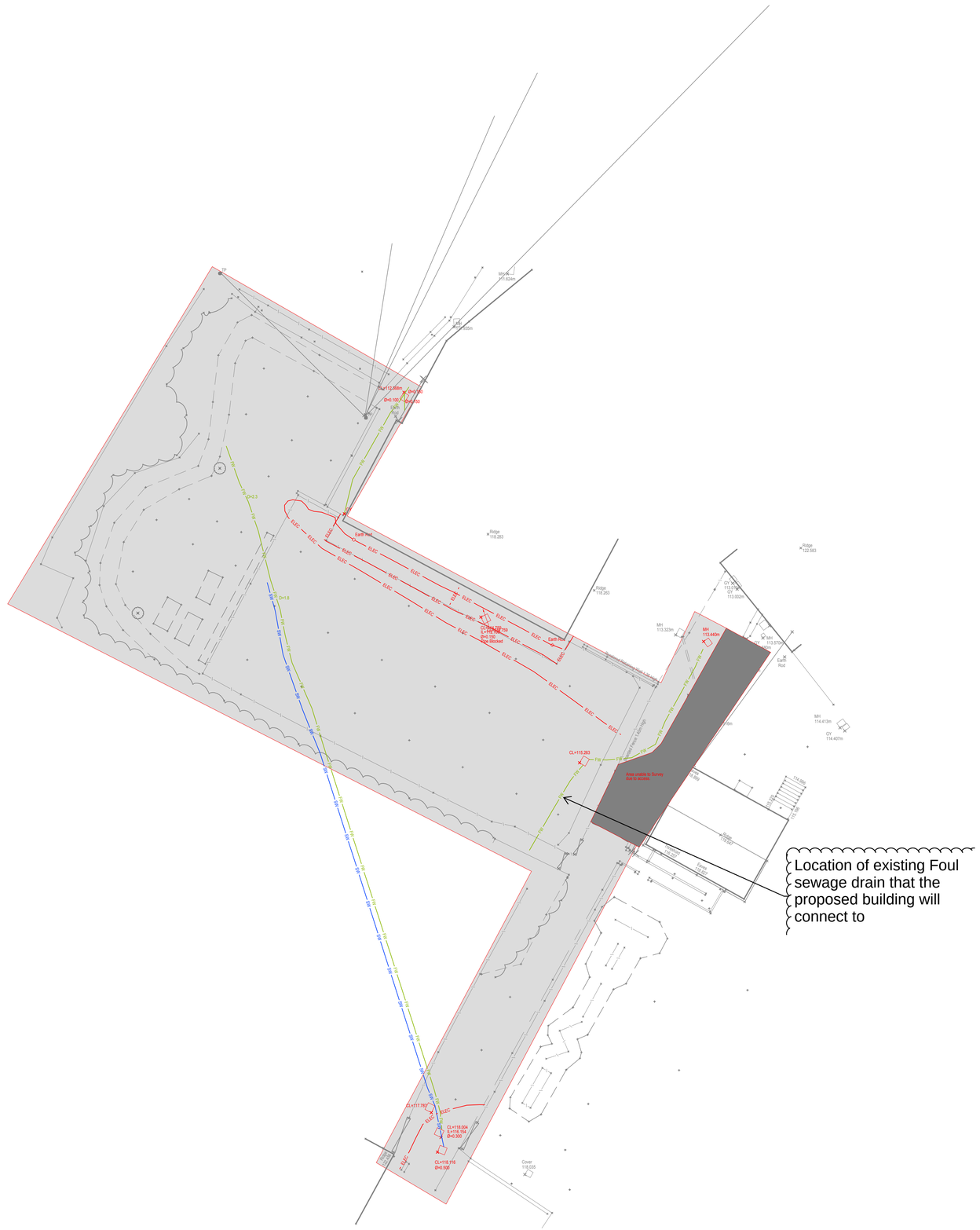
Client:
Faithful & Gould

Project:
Trewirgie Junior School
Redruth

Title:
Topographical Survey

Date: 05.04.2019	Scale 1:200@A1	Cad Ref:
Surveyor: ADS/BL	Drawn: ADS	Checked: ADS
Job/Dwg No: 0419-1039-002		Rev -

1:200
4m 0 4m 8m 12m 16m 20m



Notes:

N

Datum Reference = Ordnance

Building Survey Legend

Building Line
Barge Board
Ground
Steps
Rain Water Pipe
Windows
Beams
Pipes
Roof
Kitchen
Ventilation
Bathroom
Storage
Heating

Floor To Sill Height	F/S 0.87	Floor Level	FL 50.00
Floor To Head Height	F/H 2.05	Ground Level	GL 52.00
Door Head Height	DH 2.05	Beam Height	BH: 2.20
Room Area	Area: 9.04	Structural Ceiling Height	SCH 2.27

Topographical Survey Legend

Banks Top
Banks Bottom
Road Centre
Kerb Line
Contour Line Major 50.00
Contour Line Minor 50.50
Fence Line
Wall
Hard edge
Soft Edge
Vegetation

BT	British Telecom	Spot Level	× 50.00
CATV	Cable Tv		
EP	Electricity Pole	Gate	
ER	Earth Rod		
FH	Fire Hydrant	Building	
FP	Flag Pole		
GAS	Gas Cover		
GY	Gully	Tree	
IC	Inspection Cover		
LP	Lamp Post		
MH	Manhole		
MKR	Marker		
RE	Rodding Eye	Station Marker	
RWP	Rain Water Pipe		
SC	Stop Cock		
SVP	Soil Vent Pipe		
TK	Top Of Kerb		
TWL	Top Of Wall	Bore Hole	Bore Hole
TP	Telegraph Pole		
WAT	Water Cover	Trial Hole	Trial Hole

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Surveying & Site Engineering

LAND & TOPOGRAPHICAL SURVEYING - MEASURED BUILDING - LASER SCANNING - 3D COLOURED POINT CLOUDS - UTILITY DETECTION & MAPPING - SITE ENGINEERING/SETTING OUT - ENGINEERING SURVEY - MACHINE CONTROL

94 FORE STREET
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Client:
Faithful & Gould

Project:
Trewirgie Junior School
Redruth

Title:
Utility Detection Survey

Date: 29.03.19	Scale 1:200@A1	Cad Ref: -
Surveyor: ADS/BL/LG	Drawn: ADS/BL	Checked: ADS
Job/Dwg No: 0319-1040-001		Rev A

E:\PROJECTS\SURVEYS - WORK IN PROGRESS\Trewirgie School\Trewirgie Junior School - Measura Utility Survey.dwg, 05/04/2019 13:56:08, DWG To PDF.pc3

Appendix B – Surface Water Calculations

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 626 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	113.223	0.623	0.1	4.0	O K
30 min Summer	113.466	0.866	0.1	5.5	O K
60 min Summer	113.744	1.144	0.1	7.3	O K
120 min Summer	114.034	1.434	0.2	9.2	O K
180 min Summer	114.186	1.586	0.2	10.1	O K
240 min Summer	114.270	1.670	0.2	10.7	O K
360 min Summer	114.367	1.767	0.2	11.3	O K
480 min Summer	114.410	1.810	0.2	11.6	O K
600 min Summer	114.438	1.838	0.2	11.7	O K
720 min Summer	114.456	1.856	0.2	11.8	O K
960 min Summer	114.471	1.871	0.2	11.9	O K
1440 min Summer	114.452	1.852	0.2	11.8	O K
2160 min Summer	114.373	1.773	0.2	11.3	O K
2880 min Summer	114.279	1.679	0.2	10.7	O K
4320 min Summer	114.112	1.512	0.2	9.7	O K
5760 min Summer	113.972	1.372	0.2	8.8	O K
7200 min Summer	113.852	1.252	0.2	8.0	O K
8640 min Summer	113.748	1.148	0.1	7.3	O K
10080 min Summer	113.659	1.059	0.1	6.8	O K
15 min Winter	113.299	0.699	0.1	4.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	108.179	0.0	19
30 min Summer	75.941	0.0	34
60 min Summer	51.110	0.0	64
120 min Summer	33.185	0.0	122
180 min Summer	25.308	0.0	182
240 min Summer	20.668	0.0	242
360 min Summer	15.566	0.0	360
480 min Summer	12.700	0.0	430
600 min Summer	10.832	0.0	488
720 min Summer	9.505	0.0	552
960 min Summer	7.723	0.0	682
1440 min Summer	5.747	0.0	956
2160 min Summer	4.263	0.0	1380
2880 min Summer	3.442	0.0	1788
4320 min Summer	2.546	0.0	2592
5760 min Summer	2.058	0.0	3352
7200 min Summer	1.746	0.0	4112
8640 min Summer	1.527	0.0	4920
10080 min Summer	1.365	0.0	5648
15 min Winter	108.179	0.0	19

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	113.573	0.973	0.1	6.2	O K
60 min Winter	113.886	1.286	0.2	8.2	O K
120 min Winter	114.216	1.616	0.2	10.3	O K
180 min Winter	114.391	1.791	0.2	11.4	O K
240 min Winter	114.491	1.891	0.2	12.1	O K
360 min Winter	114.612	2.012	0.2	12.8	O K
480 min Winter	114.668	2.068	0.2	13.2	O K
600 min Winter	114.690	2.090	0.2	13.3	O K
720 min Winter	114.709	2.109	0.2	13.5	O K
960 min Winter	114.719	2.119	0.2	13.5	O K
1440 min Winter	114.674	2.074	0.2	13.2	O K
2160 min Winter	114.546	1.946	0.2	12.4	O K
2880 min Winter	114.405	1.805	0.2	11.5	O K
4320 min Winter	114.154	1.554	0.2	9.9	O K
5760 min Winter	113.956	1.356	0.2	8.7	O K
7200 min Winter	113.793	1.193	0.1	7.6	O K
8640 min Winter	113.657	1.057	0.1	6.7	O K
10080 min Winter	113.541	0.941	0.1	6.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	75.941	0.0	33
60 min Winter	51.110	0.0	62
120 min Winter	33.185	0.0	120
180 min Winter	25.308	0.0	178
240 min Winter	20.668	0.0	236
360 min Winter	15.566	0.0	348
480 min Winter	12.700	0.0	454
600 min Winter	10.832	0.0	546
720 min Winter	9.505	0.0	570
960 min Winter	7.723	0.0	722
1440 min Winter	5.747	0.0	1026
2160 min Winter	4.263	0.0	1472
2880 min Winter	3.442	0.0	1904
4320 min Winter	2.546	0.0	2728
5760 min Winter	2.058	0.0	3528
7200 min Winter	1.746	0.0	4328
8640 min Winter	1.527	0.0	5104
10080 min Winter	1.365	0.0	5848

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.272	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.020

Time (mins) From:	To:	Area (ha)
0	4	0.020

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Model Details

Storage is Online Cover Level (m) 114.800

Cellular Storage Structure

Invert Level (m) 112.600 Safety Factor 3.0
Infiltration Coefficient Base (m/hr) 0.08388 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.08388

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	6.7	6.7	2.201	0.0	29.6
2.200	6.7	29.6			

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	0.020	Urban	0.000
SAAR (mm)	1273	Region Number	Region 8

Results l/s

QBAR Rural	0.1
QBAR Urban	0.1
Q100 years	0.2
Q1 year	0.1
Q30 years	0.1
Q100 years	0.2

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 72 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	113.557	1.157	0.0	0.7	0.7	3.5	O K
30 min Summer	113.909	1.509	0.0	0.8	0.8	4.6	O K
60 min Summer	114.175	1.775	0.0	0.9	0.9	5.4	O K
120 min Summer	114.319	1.919	0.0	0.9	0.9	5.8	O K
180 min Summer	114.311	1.911	0.0	0.9	0.9	5.8	O K
240 min Summer	114.255	1.855	0.0	0.9	0.9	5.6	O K
360 min Summer	114.135	1.735	0.0	0.9	0.9	5.3	O K
480 min Summer	114.007	1.607	0.0	0.8	0.8	4.9	O K
600 min Summer	113.882	1.482	0.0	0.8	0.8	4.5	O K
720 min Summer	113.765	1.365	0.0	0.8	0.8	4.2	O K
960 min Summer	113.558	1.158	0.0	0.7	0.7	3.5	O K
1440 min Summer	113.239	0.839	0.0	0.6	0.6	2.6	O K
2160 min Summer	112.910	0.510	0.0	0.5	0.5	1.6	O K
2880 min Summer	112.570	0.170	0.0	0.5	0.5	0.5	O K
4320 min Summer	112.459	0.059	0.0	0.4	0.4	0.2	O K
5760 min Summer	112.445	0.045	0.0	0.3	0.3	0.1	O K
7200 min Summer	112.438	0.038	0.0	0.3	0.3	0.1	O K
8640 min Summer	112.434	0.034	0.0	0.3	0.3	0.1	O K
10080 min Summer	112.431	0.031	0.0	0.2	0.2	0.1	O K
15 min Winter	113.712	1.312	0.0	0.8	0.8	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	108.179	0.0	4.1	17
30 min Summer	75.941	0.0	5.7	31
60 min Summer	51.110	0.0	7.7	52
120 min Summer	33.185	0.0	10.0	86
180 min Summer	25.308	0.0	11.4	122
240 min Summer	20.668	0.0	12.4	156
360 min Summer	15.566	0.0	14.0	224
480 min Summer	12.700	0.0	15.2	290
600 min Summer	10.832	0.0	16.2	356
720 min Summer	9.505	0.0	17.1	420
960 min Summer	7.723	0.0	18.5	548
1440 min Summer	5.747	0.0	20.7	794
2160 min Summer	4.263	0.0	23.0	1168
2880 min Summer	3.442	0.0	24.8	1496
4320 min Summer	2.546	0.0	27.5	2184
5760 min Summer	2.058	0.0	29.6	2888
7200 min Summer	1.746	0.0	31.4	3656
8640 min Summer	1.527	0.0	33.0	4312
10080 min Summer	1.365	0.0	34.4	5032
15 min Winter	108.179	0.0	4.5	17

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	114.126	1.726	0.0	0.9	0.9	5.2	O K
60 min Winter	114.455	2.055	0.0	0.9	0.9	6.2	O K
120 min Winter	114.613	2.213	0.0	1.0	1.0	6.7	O K
180 min Winter	114.575	2.175	0.0	1.0	1.0	6.6	O K
240 min Winter	114.469	2.069	0.0	0.9	0.9	6.3	O K
360 min Winter	114.262	1.862	0.0	0.9	0.9	5.7	O K
480 min Winter	114.058	1.658	0.0	0.8	0.8	5.0	O K
600 min Winter	113.871	1.471	0.0	0.8	0.8	4.5	O K
720 min Winter	113.705	1.305	0.0	0.8	0.8	4.0	O K
960 min Winter	113.429	1.029	0.0	0.7	0.7	3.1	O K
1440 min Winter	113.038	0.638	0.0	0.6	0.6	1.9	O K
2160 min Winter	112.508	0.108	0.0	0.5	0.5	0.3	O K
2880 min Winter	112.457	0.057	0.0	0.4	0.4	0.2	O K
4320 min Winter	112.440	0.040	0.0	0.3	0.3	0.1	O K
5760 min Winter	112.433	0.033	0.0	0.2	0.2	0.1	O K
7200 min Winter	112.429	0.029	0.0	0.2	0.2	0.1	O K
8640 min Winter	112.427	0.027	0.0	0.2	0.2	0.1	O K
10080 min Winter	112.425	0.025	0.0	0.2	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	75.941	0.0	6.4	31
60 min Winter	51.110	0.0	8.6	58
120 min Winter	33.185	0.0	11.2	92
180 min Winter	25.308	0.0	12.8	130
240 min Winter	20.668	0.0	13.9	168
360 min Winter	15.566	0.0	15.7	240
480 min Winter	12.700	0.0	17.1	310
600 min Winter	10.832	0.0	18.2	376
720 min Winter	9.505	0.0	19.2	442
960 min Winter	7.723	0.0	20.8	570
1440 min Winter	5.747	0.0	23.2	834
2160 min Winter	4.263	0.0	25.8	1124
2880 min Winter	3.442	0.0	27.8	1440
4320 min Winter	2.546	0.0	30.8	2184
5760 min Winter	2.058	0.0	33.2	2928
7200 min Winter	1.746	0.0	35.2	3536
8640 min Winter	1.527	0.0	36.9	4368
10080 min Winter	1.365	0.0	38.5	5112

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.272	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.020

Time (mins) From:	To:	Area (ha)
0	4	0.020

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Model Details

Storage is Online Cover Level (m) 114.800

Cellular Storage Structure

Invert Level (m) 112.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	3.2	3.2	2.401	0.0	20.5
2.400	3.2	20.5			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0038-1000-2400-1000
Design Head (m)	2.400
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	38
Invert Level (m)	112.400
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.400	1.0
Flush-Flo™	0.164	0.5
Kick-Flo®	0.337	0.4
Mean Flow over Head Range	-	0.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.5	1.200	0.7	3.000	1.1	7.000	1.6
0.200	0.5	1.400	0.8	3.500	1.2	7.500	1.7
0.300	0.5	1.600	0.8	4.000	1.3	8.000	1.7
0.400	0.5	1.800	0.9	4.500	1.3	8.500	1.8
0.500	0.5	2.000	0.9	5.000	1.4	9.000	1.8
0.600	0.5	2.200	1.0	5.500	1.5	9.500	1.9
0.800	0.6	2.400	1.0	6.000	1.5		
1.000	0.7	2.600	1.0	6.500	1.6		

Appendix N. Asbestos Refurbishment Survey

Engineering Services Laboratory
Radnor Road, Scorrier, Redruth TR16 5EH
TEL : 01872 327381 FAX : 01209 821539

0261

Asbestos Refurbishment Survey

Site Address:	Trewirgie Junior School Falmouth Road Redruth TR15 2QN	**Surveyors:** **Report prepared by:**	ESL WYG Please refer to individual reports for details Paul Laban
UPRN number:	2222	**Date of survey:**	WYG - 18 & 29th July 2010 ESL – 21st December 2010
Project number:	75813	**Report Date:**	22/12/2010

Executive Summary

This report supersedes the previous WYG report dated 18th & 29th July 2010, it also supersedes any previous individual or specific asbestos report related to the PFI Back Log Maintenance Project for Trewirgie Junior School. The purpose of this report is to combine and summarise a series of surveys undertaken at Trewirgie Junior School in order to present an updated report of the presence of asbestos within the areas surveyed. Surveys have been completed by Cornwall Councils (CC) Engineering Services Laboratory (ESL) and by WYG Environment (WYG) (subcontracted by ESL) on behalf of Alan Chapman, Corporate Projects Group Manager (CC). This work has been completed prior to refurbishment work required as part of the PFI backlog maintenance scheme.

The information referred to in this document are:

- WYG, Trewirgie Junior School Refurbishment/Demolition Survey Report A066119. Dated 18/07/10 & 29/07/10.
- ESL Bulk sampling 28/10/10
- ESL Trewirgie Junior School Refurbishment/Demolition Survey of specific areas. Completed 21/12/10.

Where the information in Tables 1,2 and 3 refers to the above documentation it has been noted in the comments column.

Asbestos was detected at various locations throughout the property (see Table 1 in Appendix 2); therefore it must be removed prior to work commencing in these areas. The types of asbestos containing materials (ACM's) detected included materials that are classed as both licensable and non licensable.

Only licensed asbestos removal contractors may work on/remove licensable material and will have to notify the Health and Safety Executive at least 14 days prior to any work on the material.

For the non licensable materials a licensed contractor does not have to be used however only suitably trained and insured contractors can work on/remove these materials following the appropriate HSE guidance including dealing with/transporting special waste.

Various dust samples were taken from some of the loft spaces in Block 1 of the school, two of which were found to contain Chrysotile (above room 0/023 & 0/018). Four negative samples were also returned, three from 0/023 and one from 0/038. Whilst varied results have been returned Chrysotile has been identified in the loft space above 0/023 and 0/018 therefore it is recommended that access to these areas is restricted and any personnel requiring entry should use Type 5 disposable overalls and a P3 rated respiratory mask.

Access was not possible to several locations (detailed in Table 3). Where asbestos ceilings exist, it must be presumed that further asbestos materials may exist in these concealed areas.

Introduction

Scope of work, purpose, aims and objectives:

To complete an asbestos survey at Trewirgie Junior School, prior to refurbishment works, in order to comply with Control of Asbestos Regulations 2006 (CAR 2006). The site comprises of a late 1800's stone built building with modern extensions. Primarily the walls and floors are stone with wood ceilings and pitched roof.

The purpose and aim of the surveys was to locate, as far as reasonably practicable, the presence and extent of any suspected Asbestos Containing Material's (ACM's) in the areas surveyed which could be damaged or disturbed during the proposed refurbishment work. Representative samples are collected and analysed using polarised light microscopy. Other similar homogenous material used for the same purpose was also presumed to contain asbestos (strongly presumed).

Method

A refurbishment survey, carried out in accordance with Health & Safety Executives publication HSG264 'Asbestos: The survey guide' and the in-house 'Asbestos Surveying Technical Procedure A1', has been conducted on the areas listed below at the above site.

Areas Included In Survey (See attached plan Appendix 1)

The areas included in survey were:

- See Table 3, Appendix 2 for details.

All other areas of the site, except those listed in Table 3, were not surveyed and are therefore not included within this report.

Inaccessible / Excluded Areas

The areas included in the survey brief that could not be accessed were:

- See Table 3, Appendix 2 for details.

The areas excluded from the survey (i.e. not reasonably practicable to access during the survey):

- concealed spaces which may exist within the fabric of the building where the extent and presence of these is not evident due to inaccessibility or insufficient knowledge of the structure at the time of the survey;

- within live electrical equipment/ general equipment where the act of sampling would endanger the surveyor or affect the functional integrity of the item concerned. For example; fuses within electrical boxes, gaskets, fire doors, ropes associated with heating, glazing or power plant etc.

Any inaccessible/excluded areas must be presumed to contain asbestos, unless there is strong evidence that it does not. If access is required to these items the client must provide access/isolation certificates before areas/electrical appliances are inspected.

Survey Results/Findings

For survey results see Table 1 (within Appendix 2). This table shows all ACM's present (please note that only positive, Strongly Presumed and Presumed (highly likely to contain asbestos but not sampled) ACM's will be recorded) along with any areas not accessed. Samples of Non-ACM's are recorded on Table 2. Representative photographs of materials are shown in Appendix 3.

Where appropriate, samples of suspected ACM's were taken from the property, representative samples were also taken of any materials that may be confused with ACM's. Sample stickers, bearing the individual sample's unique number, were applied to the point of sampling, for future reference (unless requested not to be used by the client). Products that were very unlikely to contain asbestos or have asbestos added were not sampled (e.g. wallpaper, plasterboard etc.).

Samples taken during the various surveys were analysed by either Scientific Services Limited or ESL using their respective in-house procedure based on HSG 248 'Asbestos: The analysts' guide for sampling, analysis and clearance procedures' – results of which can be found in Appendix 4.

Variations/deviations

No variations or deviations from the In-House Procedure were recorded at the time of the survey.

Conclusions and actions

Asbestos was detected at various locations throughout the property (see Table 1 in Appendix 2); therefore it must be removed prior to work commencing in these areas. The types of asbestos containing materials (ACM's) detected included materials that are classed as both licensable and non licensable.

Only licensed asbestos removal contractors may work on/remove licensable material and will have to notify the Health and Safety Executive at least 14 days prior to any work on the material.

For the non licensable materials a licensed contractor does not have to be used however only suitably trained and insured contractors can work on/remove these materials following the appropriate HSE guidance including dealing with/transporting special waste.

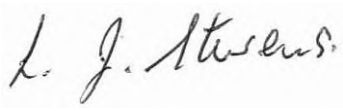
Various dust samples were taken from some of the loft spaces in Block 1 of the school, two of which were found to contain Chrysotile (above room 0/023 & 0/018). Four negative samples were also returned, three from 0/023 and one from 0/038. Whilst varied results have been returned Chrysotile has been identified in the loft space above 0/023 and 0/018 therefore it is recommended that access to these areas is restricted and any personnel requiring entry should use Type 5 disposable overalls and a P3 rated respiratory mask.

Access was not possible to several locations (detailed in Table 3). Where asbestos ceilings exist, it must be presumed that further asbestos materials may exist in these concealed areas.

Authorised by:

Claire Stephen – Asbestos Manager

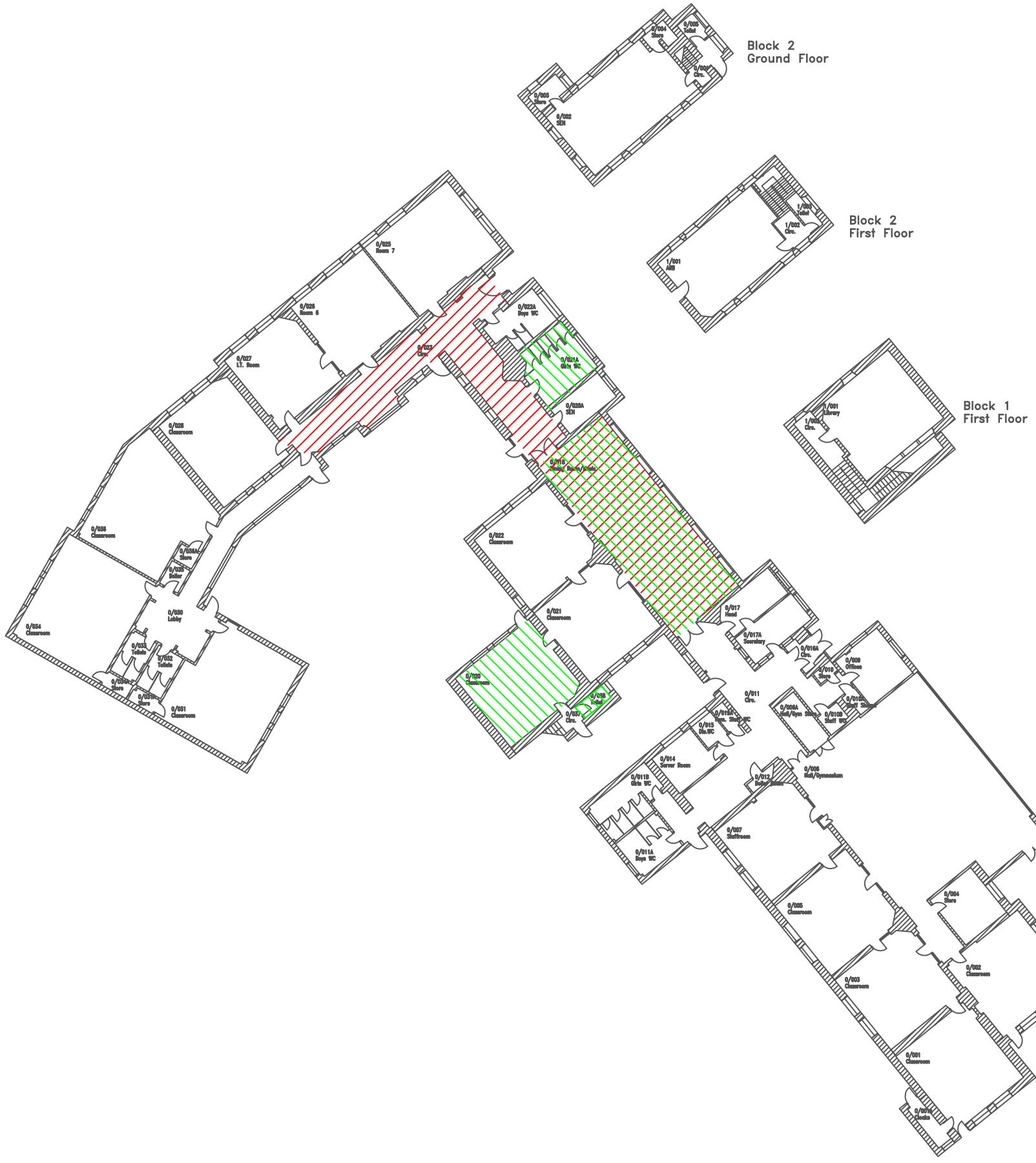
Surveyed by:



J. Stevens - Geoenvironmental Engineer (ESL) & WYG Environment

APPENDIX 1

PLAN



Legend

Licensable Asbestos Containing Materials

Non-licensable Asbestos Containing Materials

See Table 3 in Appendix 2 for details of areas surveyed and inaccesable areas

Trewirgie Junior School

908/2222A00

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CORNWALL COUNCIL

Rev	Description	Drawn	Chkd.	Date
00				

Property: Trewirgie Junior School
Redruth

Title: Sample Point & ACM Location Plan

Scale: NTS	Drawn: PL	Filename:	
Date: 22/12/2010	Checked:	Drawing No: 1 of 1	Rev: 0
Survey: Various 2010	Job: 75813		

APPENDIX 2

TABLES 1, 2 & 3

Table 1: Asbestos Containing Materials (including presumed materials not sampled and no access areas)

B	F	R	Room Description	Sample Ref. No:	Material Location	Approx. Quantity (m^2)	Asbestos Type	Product Type	Condition	Comments
1	0	018	Dining Rm/Music	SP	Felt to underside of roof	1	Presumed Chrysotile	Asbestos Felt	Good	Visually similar to sample 180710PRJ02 (WYG)
1	0	018	Dining Rm/Music	180710P RJ03	Dust sample from floor of ceiling void	60	Chrysotile	Asbestos Debris	Poor	(WYG)
1	0	020	Classroom	180710P RJ04	Ceiling panels	50	Chrysotile	Asbestos Cement	Good	(WYG)
1	0	21A	Girls WC	180710P RJ29	Textured coating to boxing within ceiling void	3	Chrysotile	Asbestos Textured Coating	Good	(WYG)
1	0	023	Circ	180710P RJ07	Dust sample from floor of ceiling void	10	Chrysotile	Asbestos Debris	Poor	(WYG)
1	0	038	Toilet	SP	High level toilet cistern	1no.	Chrysotile	Asbestos Resin	Good	180710PRJ11 Same as ESL sample 6062/07 (WYG)

KEY: **P** = PRESUMED; **SP** = STRONGLY PRESUMED. Accessibility - low, medium or high based on surveyors opinion. N/A = Not Applicable

Table 2: Suspect Asbestos Containing Materials found not to contain asbestos

B	F	R	Room No. / Description	Sample Ref. No:	Material Location	Asbestos type	Product Type	Comments
1	-	Ext	Externals	290710PRJ48	Roof over old school	**Asbestos Not Detected**	Cement	(WYG)
1	-	Ext	Externals	290710PRJ49	Roof over new extension	**Asbestos Not Detected**	Cement	(WYG)
1	-	Ext	Externals	290710PRJ50	Panel above doorway outside area 0/037	**Asbestos Not Detected**	Insulating Board	(WYG)
1	0	007	Staffroom	290710PRJ40	Sink Pad	**Asbestos Not Detected**	Bitumen	Same material identified in 0/005, 0/003, 0/001, 0/002 & 0/004 (WYG)
1	0	017A	Secretary	180710PRJ34	Textured coating to ceiling above suspended ceiling	**Asbestos Not Detected**	Textured Coating	Same material identified in 0/017 (WYG)
1	0	018	Dining Room/Music	180710PRJ01	High level firebreak/cladding to beams	**Asbestos Not Detected**	Insulating Board	Refers to ESL sample 6062/01 (WYG)
1	0	021	Classroom	180710PRJ32	Panels above windows leading to 022	**Asbestos Not Detected**	Insulating Board	Same material identified in 0/021 (WYG)
1	0	022	Classroom	180710PRJ30	Upstands to ceiling above windows	**Asbestos Not Detected**	Insulating Board	Refers to ESL sample 6062/06 (WYG)
1	0	022	Classroom	180710PRJ31	Panels below and behind heater	**Asbestos Not Detected**	Insulating board	(WYG)
1	0	023	Circ	180710PRJ05	Dust sample from floor of ceiling void	**Asbestos Not Detected**	Insulating Board	(WYG)
1	0	023	Circ	5356/01	Debris from ceiling void	**Asbestos Not Detected**	Debris	(ESL)
1	0	023	Circ	5356/02	Debris from ceiling void	**Asbestos Not Detected**	Debris	(ESL)
1	0	023	Circ	180710PRJ06	Panel below heater to floor	**Asbestos Not Detected**	Insulating Board	Refers to ESL sample 6062/01 (WYG)
1	0	026	Room 6	180710PRJ09	Panel below heater	**Asbestos Not**	Insulating Board	(WYG)

					to floor	**Detected**		
1	0	026	Room 6	180710PRJ10	Panels above windows above suspended ceiling	**Asbestos Not Detected**	Insulating Board	(WYG)
1	0	027	IT Room	180710PRJ08	Panels above windows above suspended ceiling	**Asbestos Not Detected**	Insulating Board	Same material identified in 0/025 (WYG)
1	0	038	Toilet	180710PRJ12	Dust sample from floor of ceiling void	**Asbestos Not Detected**	Insulating Board	(WYG)
2	-	Ext	Externals	180710PRJ20	Soffit boards to low level roof	**Asbestos Not Detected**	Insulating Board	Same material to high level roof soffit (WYG)
2	-	Ext	Externals	180710PRJ22	Roof Slates	**Asbestos Not Detected**	Cement	(WYG)
2	-	Ext	Externals	180710PRJ23	Undercloaking to roof	**Asbestos Not Detected**	Cement	(WYG)
2	0	001	SEN	180710PRJ18	Ceiling	**Asbestos Not Detected**	Textured Coating	(WYG)
2	0	001	SEN	180710PRJ19	Sink Pad	**Asbestos Not Detected**	Bitumen	(WYG)
2	1	001	ARB	180710PRJ13	Panels above windows	**Asbestos Not Detected**	Insulating Board	(WYG)
2	1	001	ARB	180710PRJ14	Panel below heater	**Asbestos Not Detected**	Insulating Board	Same material identified in 0/003 & 0/002 (WYG)
2	1	001	ARB	180710PRJ15	Panel behind heater	**Asbestos Not Detected**	Insulating Board	(WYG)
2	1	001	ARB	180710PRJ16	Fibreboard wall panel	**Asbestos Not Detected**	Paper	(WYG)
2	1	001	ARB	180710PRJ17	Sink Pad	**Asbestos Not Detected**	Bitumen	(WYG)
3	-	Ext	External	180710PRJ27	Roof slates	**Asbestos Not Detected**	Cement	(WYG)
3	0	001	Lobby	180710PRJ24	Felt to underside of roof	**Asbestos Not Detected**	Felt	(WYG)
3	0	001	Lobby	180710PRJ25	Dust sample from	**Asbestos Not**	Insulating Board	(WYG)

					floor in ceiling void	**Detected**		
3	0	001	Lobby	180710PRJ26	Fibreboard coated hatch panel to ceiling void	**Asbestos Not Detected**	Paper	(WYG)

Table 3: Areas inspected & areas not accessed (please note if not on this table or in area not accessed assumed asbestos may be present until proven otherwise)

B	F	R	Room No. / Description	Area/s requested to be Inspected	Areas not accessed & reason	Comments
1	-	Ext	Externals	All Areas	-	(WYG)
1	0	-	Stairs	Ceiling & Walls	~~-~~	(WYG)
1	0	001	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	001A	Cloaks	Ceiling & walls	-	(WYG)
1	0	002	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	002	Classroom	Loft space above room	-	(ESL)
1	0	003	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	003	Classroom	Loft space above room	-	(ESL)
1	0	004	Store	Walls, ceiling & ceiling void	~~No access to high level ceiling void~~ Accessed by ESL 21/12/10	(WYG) (ESL)
1	0	005	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	005	Classroom	Loft space above room	-	(ESL)
1	0	006	Hall/Gym	Roof & walls	-	(WYG)
1	0	007	Staffroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	007	Staffroom	Loft space above room	-	(ESL)
1	0	009	Office	Walls, ceiling & above suspended ceiling	~~No access to skylights~~ Accessed by ESL 21/12/10	(WYG) (ESL)
1	0	010A	Staff Shower	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	010B	Staff WC	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	011	Circ	All areas including ceiling void	-	(ESL)
1	0	011B	Girls WC	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	011A	Boys WC	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	012	Boiler room	Walls, ceiling & ceiling void	No access to void above fixed ceiling	(WYG)
1	0	014	Server Room	Walls, ceiling & ceiling void	~~Not Accessed – no keys available~~ Surveyed by ESL 21/12/10	(WYG) (ESL)
1	0	015	Dis WC	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	017	Head	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	017A	Secretary	Walls, ceiling & above suspended ceiling	-	(WYG)

1	0	018	Dining Room	Walls, ceiling & ceiling void	-	(WYG)
1	0	019A	Staff WC	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	020A	SEN	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	020	Classroom	Walls, ceiling & ceiling void	No access to ceiling void due to asbestos ceiling	(WYG)
1	0	021A	Girls WC	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	021	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	022A	Boys WC	Walls, ceiling & above suspended ceiling	No access to cylinder cupboard	(WYG)
1	0	022	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	023	Circ	Walls, ceiling & ceiling void	-	(WYG)
1	0	025	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	026	Classroom	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	027	IT Room	Walls, ceiling & above suspended ceiling	-	(WYG)
1	0	037	Circ	Walls, ceiling & ceiling void	-	(WYG)
1	0	038	Toilet	Walls, ceiling & ceiling void	-	(WYG)
1	0	038	Toilet	Under floor covering	-	(ESL)
1	0	001	Library	All areas – Loft space not required	No access to loft space	(ESL)
2	0	001	ARB	All Areas	-	(WYG)
2	0	002	Circ	All Areas	-	(WYG)
2	0	003	Toilet	All Areas	-	(WYG)
2	1	001	Circ	All Areas	-	(WYG)
2	1	002	SEN	All Areas	-	(WYG)
2	1	003	Store	All Areas	-	(WYG)
2	1	004	Store	All Areas	-	(WYG)
2	1	005	Toilet	All Areas	-	(WYG)
3	0	Ext	Externals	Roof	-	(WYG)
3	0	001	Lobby	Walls, ceiling & ceiling void	-	(WYG)
3	0	002	Music	All Areas	-	(ESL)
3	0	003	Store	All Areas	-	(ESL)

APPENDIX 3

PHOTOS

Photo 1: 0/018 Dining/Music – asbestos felt to underside of roof in loft space

Photo 2: 0/20 Classroom – asbestos cement ceiling

Photo 3: 0/21A Girls WC – Asbestos textured coating in ceiling void

Photo 4: 0/038 Toilet – Asbestos toilet cistern

APPENDIX 4

BULK ANALYSIS REPORTS

Engineering Services Laboratory

Radnor Road, Scorrier, Redruth TR16 5EH TEL : 01872 327381 FAX : 01209 821539

ASBESTOS BULK SAMPLE ANALYSIS TEST REPORT

0756

In House Method based on HSG248

Scheme / Site: **PFI Trewirgie Junior School**

Location: **Ceiling void in 0/023 Circulation**

Date Sampled: **28/10/2010**
Sampled By: **JS**
Date Received: **28/10/2010**
Date Tested: **28/10/2010**
Tested By: **JS**

Test Report No:	**AS6215.1**
Project No:	**75813**
Client Ref:	**CCEP095581**
Sample Cert No:	**AS 5356**
Date Reported:	**28/10/2010**
Page Number:	**1 of 1**

Test Results

Sub Sample Number	Client Sample Number	Sample Type	Sample Details	Asbestos Type(s) Present
1	-	Debris	0/023 Circ. - ceiling void	AND
2	-	Debris	0/023 Circ. - ceiling void	AND

For additional information see the Sampling Certificate.

KEY:
Sample Type: A = Adhesive, C = Cement, D = Dust/Debris, FB = Fibre Board, G = Gasket, IB = Insulating Board, I = Insulation , L = Lagging, PL = Pipe Lagging, R = Resin, RF = Roof Felt, SP = Sink Pad ,SC = Spray Coating, P = Paper, TC = Textured Coating, T = Textile, VFT = Vinyl Floor Tile, VFC = Vinyl Floor Covering, W = Wood, O= Other (detailed).
Asbestos Type: AM = Amosite, CH = Chrysotile, CR = Crocidolite, Trem = Fibrous Tremolite, Actin = Fibrous Actinolite, Anth = Fibrous Anthophyllite, AND = Asbestos Not Detected.

Remarks : Materials have been referred to as Asbestos Insulation Board or Asbestos Cement based on upon their asbestos content and visual appearance alone. Water absorbency checks on materials have not been carried out unless stated otherwise. Where this has been done, the test is outside the scope of UKAS Accreditation.
Where samples have not been taken by Engineering Services Laboratory, it can only report analysis results. No responsibility can be taken for any consequences arising from the client's sampling strategy or procedures, or the use of these results in subsequent reports.

Client Name: **PFI Team**
F.A.O: **Mr. Peter White**
Address: **PFI Team Room 313**
P,T & E
New County Hall
TRURO
TR1 3AY
Tel No: 01872 322711 Fax No:

Authorised Signatory:

Paul Laban – Geoenvironmental Engineer

Scientific Services Ltd.
St. Stephen, St. Austell, Cornwall PL26 7QF
TEL: (01726) 878 900 FAX: (01726) 878 901
Email:enquiries@scientificservices.org
Web:www.scientificservices.org

2577

ASBESTOS BULK ANALYSIS TEST REPORT

Test Report Number R47683

SOP No. D3TA1 based on HSG248 Appendix2

WYG Environment 5 Th Floor Longcross Court 47 Newport Rd Cardiff CF24 0AD	
Date Samples Received by Lab:-	22/07/2010

Location:-	Trewirgie Junior School
Date Sampled:-	18/07/2010
Sampled by:-	Paul Johnson
Date Tested:-	29/07/2010
Tested By:-	James Bolt
Your Order:-	C10/311
SSL Job No:-	45505

TEST RESULTS

Test Number	Client Sample Number	Sample Type	Sample Details	Asbestos Type(s) Present
159218	180710PRJ03	DD	GF Main School Area 0/018 - Dust Sample To Floor	CHR.
159219	180710PRJ04	C	GF Main School Area 0/020 - Ceiling Panels	CHR.
159220	180710PRJ05	DD	GF Main School Area 0/023 - Dust Sample To Floor	NAD
159221	180710PRJ07	DD	GF Main School Area 0/023 - Dust Sample To Floor	CHR.
159222	180710PRJ08	IB	GF Main School Area 0/027 - Panels Above Windows	NAD
159223	180710PRJ09	IB	GF Main School Area 0/026 - Panel Below Heater	NAD
159224	180710PRJ10	IB	GF Main School Area 0/026 - Panel Above Window	NAD
159225	180710PRJ12	DD	GF Main School Area 0/038 - Dust Sample Above Wood	NAD
159226	180710PRJ13	IB	Block 2 FF Area 1/001 - Panels Above Window	NAD
159227	180710PRJ14	IB	Block 2 FF Area 1/001 - Panel Below Heater	NAD
159228	180710PRJ15	IB	Block 2 FF Area 1/001 - Panel Above Heater	NAD
159229	180710PRJ16	IB	Block 2 FF Area 1/001 - Fibreboard Wall Panel	NAD
159230	180710PRJ17	B	Block 2 FF Area 1/001 - Sink Pad	NAD
159231	180710PRJ18	TC	Block 2 GF Area 0/001 - Textured Coating Ceiling	NAD
159232	180710PRJ19	B	Block 2 GF Area 0/002 - Sink Pad	NAD
159233	180710PRJ20	IB	Block 2 External - Soffit Boards	NAD
159234	180710PRJ22	C	Block 2 External - Roof Slates	NAD
159235	180710PRJ23	C	Block 2 External - Undercloaking To Roof	NAD
159236	180710PRJ24	B	Block 3 GF Area 0/001 - Felt Roof Above Ceiling	NAD
159237	180710PRJ25	DD	Block 3 GF Area 0/001 - Dust Sample Above Ceiling	NAD
159238	180710PRJ26	IB	Block 3 GF Area 0/001 - Hatch Cover	NAD
159239	180710PRJ27	C	Block 3 External - Roof Slates	NAD
159240	180710PRJ29	TC	GF Main School Area 0/021A - Textured Coating	CHR.
159241	180710PRJ31	IB	GF Main School Area 0/022 - Panels Below Heater	NAD
159242	180710PRJ32	IB	GF Main School Area 0/021 - Panels Above Windows	NAD

Additional Comments

Authorisation Code	20107291331
Authorised by	Nick Brokenshire
Technical Approval	20102101331
Authorised by:	James Bolt

KEY

Sample Type: B = Bituminous Product, C = Cement, DD = Dust & Debris,G = Gasket, HSL = Hard Set Lagging, IB - Insulation Board, L = Preformed/Friable Lagging, LFF = Loose Fill Fibres, MP = Mineral Products, PS = Plaster, PT = Paint, RP = Reinforced Plastic S = Soils, SC = Spray Coating, TC = Textured Coating, TFT = Thermoplastic Floor Tiles, VFT = Vinyl Floor Tiles, T = Textiles O = Other (detailed).

Asbestos Type: AMO = Amosite, CHR = Chrysotile, CROC = Crocidolite, TRE = Fibrous Tremolite, ACT = Fibrous Actinolite, ANT = Fibrous Anthophyllite, NAD = No Asbestos Detected

Remarks: Materials have been referred to as Asbestos Insulation Board or Asbestos Cement based on upon their asbestos content and visual appearance alone. Density checks on materials have not been carried out unless stated otherwise. Where samples have not been taken by Scientific Services Ltd, it can only report analysis results. No responsibility can be taken for any consequences arising from the clients sampling strategy or procedures, or the use of these results in subsequent reports. *Tests so marked in this report are not included in the UKAS accreditation schedule for this laboratory. Tests marked $ in this report have been subcontracted to a UKAS accredited laboratory.

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Email:enquiries@scientificservices.org
Web:www.scientificservices.org

2577

ASBESTOS BULK ANALYSIS TEST REPORT

Test Report Number **R47683**

SOP No. D3TA1 based on HSG248 Appendix2

159243	180710PRJ35	TC	GF Main School Area 0/017A - Textured Coating	NAD

Additional Comments

Authorisation Code	20107291331
Authorised by	Nick Brokenshire
Technical Approval	20102101331
Authorised by:	James Bolt

KEY

Sample Type: B = Bituminous Product, C = Cement, DD = Dust & Debris,G = Gasket, HSL = Hard Set Lagging, IB - Insulation Board, L = Preformed/Friable Lagging, LFF = Loose Fill Fibres, MP = Mineral Products, PS = Plaster, PT = Paint, RP = Reinforced Plastic S = Soils, SC = Spray Coating, TC = Textured Coating, TFT = Thermoplastic Floor Tiles, VFT = Vinyl Floor Tiles, T = Textiles O = Other (detailed).

Asbestos Type: AMO = Amosite, CHR = Chrysotile, CROC = Crocidolite, TRE = Fibrous Tremolite, ACT = Fibrous Actinolite, ANT = Fibrous Anthophyllite, NAD = No Asbestos Detected

Remarks: Materials have been referred to as Asbestos Insulation Board or Asbestos Cement based on upon their asbestos content and visual appearance alone. Density checks on materials have not been carried out unless stated otherwise. Where samples have not been taken by Scientific Services Ltd, it can only report analysis results. No responsibility can be taken for any consequences arising from the clients sampling strategy or procedures, or the use of these results in subsequent reports. *Tests so marked in this report are not included in the UKAS accreditation schedule for this laboratory. Tests marked $ in this report have been subcontracted to a UKAS accredited laboratory.

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Email:enquiries@scientificservices.org
Web:www.scientificservices.org

2577

ASBESTOS BULK ANALYSIS TEST REPORT

Test Report Number R47991

SOP No. D3TA1 based on HSG248 Appendix2

WYG Environment
5 Th Floor
Longcross Court
47 Newport Rd
Cardiff CF24 0AD

Date Samples Received by Lab:-	03/08/2010

Location:-	Trewirgie Junior School
Date Sampled:-	29/07/2010
Sampled by:-	Paul Johnson
Date Tested:-	03/08/2010
Tested By:-	Melanie Lewis
Your Order:-	C10/344
SSL Job No:-	45813

TEST RESULTS

Test Number	Client Sample Number	Sample Type	Sample Details	Asbestos Type(s) Present
160444	290710PRJ40	B	Area 0/007 - Sink Pad	NAD
160445	290710PRJ48	C	External Old School - Slate Tiles	NAD
160446	290710PRJ49	C	External New Extension - Slate Tiles	NAD
160447	290710PRJ50	IB	External To Area 0/037 - Panel Above Door	NAD

Additional Comments

Authorisation Code	2010831559
Authorised by	Nick Brokenshire
Technical Approval	20102151559
Authorised by:	James Bolt

KEY

Sample Type: B = Bituminous Product, C = Cement, DD = Dust & Debris,G = Gasket, HSL = Hard Set Lagging, IB - Insulation Board, L = Preformed/Friable Lagging, LFF = Loose Fill Fibres, MP = Mineral Products, PS = Plaster, PT = Paint, RP = Reinforced Plastic S = Soils, SC = Spray Coating, TC = Textured Coating, TFT = Thermoplastic Floor Tiles, VFT = Vinyl Floor Tiles, T = Textiles O = Other (detailed).

Asbestos Type: AMO = Amosite, CHR = Chrysotile, CROC = Crocidolite, TRE = Fibrous Tremolite, ACT = Fibrous Actinolite, ANT = Fibrous Anthophyllite, NAD = No Asbestos Detected

Remarks: Materials have been referred to as Asbestos Insulation Board or Asbestos Cement based on upon their asbestos content and visual appearance alone. Density checks on materials have not been carried out unless stated otherwise. Where samples have not been taken by Scientific Services Ltd, it can only report analysis results. No responsibility can be taken for any consequences arising from the clients sampling strategy or procedures, or the use of these results in subsequent reports. *Tests so marked in this report are not included in the UKAS accreditation schedule for this laboratory. Tests marked $ in this report have been subcontracted to a UKAS accredited laboratory.

Appendix O. Design Risk Register

Designer's Risk Assessment – Builders Work

Project No: 5188434	**Project name: Trewirgie Junior School New Classroom Block**	**Area: Trewirgie, Redruth, Cornwall**	**Page Count: 3**
RIBA Stage: 4	**Prepared by: S Thompson**	**Reviewed by: T Unwin**	**Date: 20/08/2019**

Ref.	Element	Activity				Potential Hazards	Raw Risk Rating			Design Mitigation	Residual Rating			Method Statements/Advice to Contractor
		C	O	M	D		I	P	R		I	P	R	
1	Asbestos.	X		X	X	Asbestos containing materials could be present, although not recorded in the Asbestos Refurbishment Survey 2013 or have deteriorated since.	3	3	9	A full review of proposed works to be undertaken with the contractor with arrangements made for the avoidance of ACM's, where this is not feasible a full R&D survey to be undertaken in affected areas prior to commencement.	2	1	2	Further action regarding any ACM's identified by the R&D survey to be determined based on the risk assessment rating and impact on works areas. All contractors and operatives to hold a Working with Non-licensed Asbestos qualification.
2	Working with solvents and sealants	X			X	Risk of ingestion or absorption through skin	2	2	4	Alternative materials to be used where possible. Hazardous materials reduced to a minimum	2	1	2	Method statement to be provided from Contractor covering COSHH assessments and method of ventilation. Prevention of static and general ignition of fumes. PPE to be worn. Fire precaution equipment provided.
3	Working with Cementitious products	X			X	Risk of ingestion, inhalation and absorption through the skin	2	2	4	Adequate provision and use of suitable PPE, adequate provision of welfare and wash-up facilities to be used prior to eating drinking or smoking	1	1	2	Refer to COSHH assessment to ensure appropriate controls are in place and used with regular briefing at tool box talks. Put in place health surveillance measure for dermatitis/burns and ensure provision of suitable skincare products.

Activity C = Construction O = Operation M = Maintenance D = Demolition
Risk I = Impact (1 low, 2 medium, 3 high) P = Probability (1 low, 2 medium, 3 high) R (Rating) = I x P

It is assumed that Safe Systems of Work (SSOW) and Method Statements will be provided where necessary.
It is assumed that works will be carried out by suitably qualified and experienced staff and contractors.
This Designer's Risk Assessment shall be read in conjunction with the Pre-construction Health and Safety File documentation.

4	Carpentry and joinery	X		X	X	Risk of injury or damage during lifting. Risk of personal injury from splinters and graze injuries.	2	2	4	Use of gauged and graded timbers only.	2	1	2	PPE to be worn. Method statement to be provided including PPE and protection. Raising materials into position and temporary support.
5	Work area	X		X	X	Risk of fall into open excavations or at unprotected changes in height	2	2	4	Task specific RAMS to incorporate consideration of suitable segregation and edge protection.	2	1	2	Unsafe areas to be segregated by appropriate barriers and a method for safe access provided
6	Work area	X		X	X	Risk of collapse to open excavations.	3	2	6	All open excavations to be regularly inspected, particularly after rainfall, suitable shoring/propping to be employed as appropriate.	2	1	2	RAMS to provide detail on frequency of inspection with suitable rescue plan. Works to be supervised with regular tool box talks provided to inform all site operatives of risk.
7	Work area	X		X		Risk to Pupils/staff from site activity	2	3	6	Site to be completely segregated using suitably fixed and tied HERAS fencing with mesh net screening, all access gates to be secured and monitored.	2	1	2	Contractors to be aware there will be a high level of interest from pupils regarding the works, all operatives to be regularly briefed on site security. Deliveries and site staff arrival times MUST be coordinated to not coincide with school drop off, collection or other relevant peak periods of activity.
8	Painting and decorating	X		X		Risk of damage to property or belongings from moisture/paint ingress. Risk of ingestion or absorption of paint materials through skin	2	2	4	Minimal use of paint in scope.	2	1	2	Power supplies to be isolated to work areas if exposed cabling is present. Contractor to use insulated rollers and materials, no washing down with water to be undertaken, except in agreed locations. Contractor to ensure any suspected paintwork is tested for presence of lead prior to preparatory work to existing surfaces. Appropriate PPE and protection to property to be provided accordingly
9	Accessibility of site.	X			X	The works to be undertaken during school term time.	3	2	4	Contractor to regularly liaise with both Primary and Junior schools to ensure all site activity does not coincide with normal school activity.	1	1	1	Potential remains for conflict with building users and will need to be monitored throughout contract.

Activity C = Construction O = Operation M = Maintenance D = Demolition
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It is assumed that Safe Systems of Work (SSOW) and Method Statements will be provided where necessary.
It is assumed that works will be carried out by suitably qualified and experienced staff and contractors.
This Designer's Risk Assessment shall be read in conjunction with the Pre-construction Health and Safety File documentation.

10	Accessibility of site.	X		X	X	Risk of emergency vehicle access being obstructed	2	2	4	The site is located immediately adjacent to the singular access for emergency vehicles to the rear of the Junior School, site set-up plan to clearly identify clear access routes.				Where emergency access routes may be temporarily obstructed there must be an agreed mitigation strategy such as out of hours deliveries/works. To be agreed prior to commencement.
11	Noise issues affecting other building users and associated stoppages.	X			X	Works could be stopped if noise/dust issues impact teaching and research functions.	2	2	4	Early and ongoing dialogue with both Trewirgie Primary and Junior schools will be required to minimise disruption.	1	1	1	In the first instance, Contract Administrator.
12	Moving materials and equipment	X		X	X	Handling issues in confined spaces. Possible musculoskeletal injuries.	2	2	4	Materials to be supplied in manageable size.	2	1	2	Contractor staff to be briefed on manual handling techniques and provide method statement for getting materials to high level areas.
13	Working at height	X		X	X	Injury to contractor, or staff member by direct fall, or tool/material falling	2	2	4	Use appropriate methods to reach the desired height. Tools and materials to be properly secured. Restrict access to work area if operations occurring at height.	2	1	2	Method statement required to cover working at height. All access equipment to be certified and properly maintained and installed.
14	Obstruction of Fire Escapes	X		X	X	Prohibiting safe exit in the event of fire with building works and materials.	3	2	6	Site manager to ensure a tidy site and work area. Scaffold design to ensure all access points remain unobstructed.	2	1	2	Site induction for all site staff, to include plan showing emergency exits and evacuation procedure. Temporary exit signage for all work areas. All works within existing school buildings to be coordinated through the Contract Administrator.
15	Mechanical and electrical works					Refer to M&E Designers risk assessment				Refer to M&E Designers risk assessment				Refer to M&E Designers risk assessment

Activity C = Construction O = Operation M = Maintenance D = Demolition
Risk I = Impact (1 low, 2 medium, 3 high) P = Probability (1 low, 2 medium, 3 high) R (Rating) = I x P

It is assumed that Safe Systems of Work (SSOW) and Method Statements will be provided where necessary.
It is assumed that works will be carried out by suitably qualified and experienced staff and contractors.
This Designer's Risk Assessment shall be read in conjunction with the Pre-construction Health and Safety File documentation.

Appendix P. Planning Application

Cornwall Council

Dolcoath Avenue Camborne Cornwall TR14 8SX
Email: planning@cornwall.gov.uk
Tel: 0300 1234151
Web: www.cornwall.gov.uk

Application number: PA19/05931

Agent:
Mr Simon Thompson
The Octagon
2nd Floor
Pynes Hill Court
Rydon Lane
Exeter
EX2 5AZ

Applicant:
Mrs Nicola Dann
Trewirgie Junior School
Redruth
TR15 2QN

Town And Country Planning Act 1990 (As Amended)
Town And Country Planning (Development Management Procedure) (England) Order 2015

Grant of Conditional Planning Permission

CORNWALL COUNCIL, being the Local Planning Authority, **HEREBY GRANTS CONDITIONAL PERMISSION,** subject to the conditions set out on the attached schedule, for the development proposed in the following application received on 9 July 2019 and accompanying plan(s):

Description of Development:	The construction of a single storey classroom block to the South Western side of the School site, to provide 2Nr classrooms along with sanitary and storage facilities. The new teaching space will allow the school intake to increase.
Location of Development:	Trewirgie Junior School Falmouth Road Redruth TR15 2QN
Parish:	Redruth

YOUR ATTENTION IS DRAWN TO THE ATTACHED NOTES.

DATED: 13 September 2019

Louise Wood - **Service Director Planning and Sustainable Development**

ACFULZ

SCHEDULE ATTACHED TO APPLICATION & DECISION NO: PA19/05931

CONDITIONS:

1 The development hereby permitted shall be begun before the expiration of 3 years from the date of this permission.

Reason: In accordance with the requirements of Section 91 of the Town and Country Planning Act 1990 (as amended by Section 51 of the Planning and Compulsory Purchase Act 2004).

2 The development hereby permitted shall be carried out in accordance with the plans listed below under the heading "Plans Referred to in Consideration of this Application".

Reason: For the avoidance of doubt and in the interests of proper planning.

3 Prior to the first commencement of the development hereby permitted, the details of a scheme for the provision of surface water management and foul water treatment shall be submitted to and approved in writing by the Local Planning Authority. The details shall include:

1. A description of the foul and surface water drainage systems operation;
2. Details of the final drainage schemes including calculations and layout;
3. A Construction Surface Water Management Plan;
4. A Construction Quality Control Plan;
5. A plan indicating the provisions for exceedance pathways, overland flow routes and proposed detention features;
6. A timetable of construction;
7. Confirmation of who will maintain the drainage systems and a plan for the future maintenance and management, including responsibilities for the drainage systems and overland flow routes.

Thereafter, the approved scheme shall be implemented in accordance with the details and timetable so agreed and the scheme shall be managed and maintained in accordance with the approved details for the lifetime of the development. Details of the maintenance schedule shall be kept up to date and be made available to the Local Planning Authority within 28 days of the receipt of a written request.

Reason: To prevent the increased risk of flooding and minimise the risk of pollution of surface water by ensuring the provision of a satisfactory means of surface water control and disposal, in accordance with policy 26 of the Cornwall Local Plan Strategic Policies 2010 - 2030 and paragraph 163 of the National Planning Policy Framework 2019.

DATED: 13 September 2019 *Louise Wood* - **Service Director Planning and Sustainable Development**

ACFULZ

SCHEDULE ATTACHED TO APPLICATION & DECISION NO: PA19/05931

PLANS REFERRED TO IN CONSIDERATION OF THIS APPLICATION:

Site/location Plan 5188434-ATK-V1-00-PL-A-400 P01 received 09/07/19
Proposed 5188434-ATK-V1-RF-PL-A-1300 P01 received 09/07/19
Proposed 5188434-ATK-V1-XX-EL-A-1400 P03 received 17/07/19
Block Plan 5188434-ATK-V1-00-PL-A-1100 P02 received 09/07/19
Illustrative Purposes only 5188434-ATK-V1-XX-SK-A-1410 P02 received 09/07/19
Block Plan 0319-1040-001 A received 09/07/19

ANY ADDITIONAL INFORMATION:

- Please note that the proposed development set out in this application would be liable for a charge under the Community Infrastructure Levy (CIL) Regulations 2010 (as amended), however, no CIL is payable as the Cornwall CIL Charging Schedule gives this type of development a zero rate. Confirmation of no CIL liability will be sent to the applicant, and any other person who has an interest in the land, under separate cover. However, if the nature of the development were to change, you are advised to contact the Council to discuss the requirement for planning permission and CIL liability.

- The developer(s) is encouraged to use sustainable building methods in the construction of the dwellings so that they are as energy-efficient as possible, in light of the Council's plan to tackle the climate emergency and help Cornwall cut its carbon footprint.

In dealing with this application, the local planning authority have worked with the applicant in a positive and proactive manner based on seeking solutions to problems arising in relation to dealing with a planning application, on this occasion this has included :

Discussions/negotiations ongoing with LPA throughout determination of planning application
Dedicated phone number of the case officer for the Applicant/Agent
Close liaison with the Town and Parish Councils in accordance with the protocol.

DATED: 13 September 2019 *Louise Wood* - **Service Director Planning and Sustainable Development**

ACFULZ

NOTES

Appeals to the Secretary of State

If the applicant is aggrieved by the decision of the local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then they may appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990. If you want to appeal, then you must do so within 6 months of the date of this notice (or 12 weeks from the date of this notice in the case of householder appeals made in relation to applications submitted on or after 6 April 2009). Appeals must be made to the Planning Inspectorate using a form which can be obtained from the Planning Inspectorate at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN or online at http://www.planningportal.co.uk . A copy of the completed appeal form must also be submitted to the Council.
Please Note:-If you intend to submit an appeal that you would like examined by inquiry then you must notify the Local Planning Authority and Planning Inspectorate (inquiryappeals@planninginspectorate.gov.uk) at least 10 days before submitting the appeal. Further details are on GOV.UK.
(https://www.gov.uk/government/collections/casework-dealt-with-by-inquiries).

The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal. The Secretary of State need not consider an appeal if it seems to him that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

In practice, the Secretary of State does not refuse to consider appeals solely because the local planning authority based their decision on a direction given by him.

Purchase Notices

If either the local planning authority or the Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on Cornwall Council. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

If this is a decision on a planning application relating to the same or substantially the same land and development as is already the subject of an enforcement notice, if you want to appeal against your local planning authority's decision on your application, then you must do so within 28 days of the date of this notice. If an enforcement notice is served relating to the same or substantially the same land and development as in your application and if you want to appeal against your local planning authority's decision on your application, then you must do so within 28 days of the date of service of the enforcement notice.

If this approval is for the erection of new buildings please refer to the note below.

Registering addresses for new properties prior to commencement

You must apply officially to register the name of any new street or the address of any new property through Cornwall Council's Street Naming and Numbering process. You are required to submit an application form, plan and appropriate fee all details of which can be found on our website at http://www.cornwall.gov.uk/streetnaming. Developers are advised to contact Street Naming and Numbering at the earliest opportunity for street naming as the process involves consultation with the local Parish, Town or City Council and can take several months to complete. For any further assistance please contact addressmanagement@cornwall.gov.uk or telephone 0300 1234 100.

Mr Simon Thompson
The Octagon
2nd Floor
Pynes Hill Court
Rydon Lane
Exeter
EX2 5AZ

Your ref: Trewirgie Junior School New C...

My ref: PA19/05931

Date: 13 September 2019

Dear Sir/Madam

The construction of a single storey classroom block to the South Western side of the School site, to provide 2Nr classrooms along with sanitary and storage facilities. The new teaching space will allow the school intake to increase. Trewirgie Junior School Falmouth Road Redruth TR15 2QN

With reference to this planning application, I enclose the Decision Notice granting permission.

If conditions have been included that must be complied with before the commencement of the development, e.g. "No development shall commence before ….", and this is not done, the development cannot be validly commenced even if it is within the time limit set by Condition.

If details are required I look forward to receiving them. Application forms can be found on http://planningportal.co.uk/ . Your attention is drawn to the fees to discharge planning conditions under The Town and Country Planning (Fees for Applications, Deemed Applications, Requests and Site Visits) (England) Regulations 2012:

£116 (*per request)* for applications not falling within fee categories 6 or 7 (non-householder applications)

£34 (*per request*) where the request relates to an application for works to an existing dwelling, or within the curtilage of such, falling within fee categories 6 or 7 (householder applications only)

You may wish to take the opportunity to submit details to discharge more than one condition per request.

Yours faithfully

Hannah England

Development Officer
Planning and Sustainable Development Service
Tel: 01209 615655

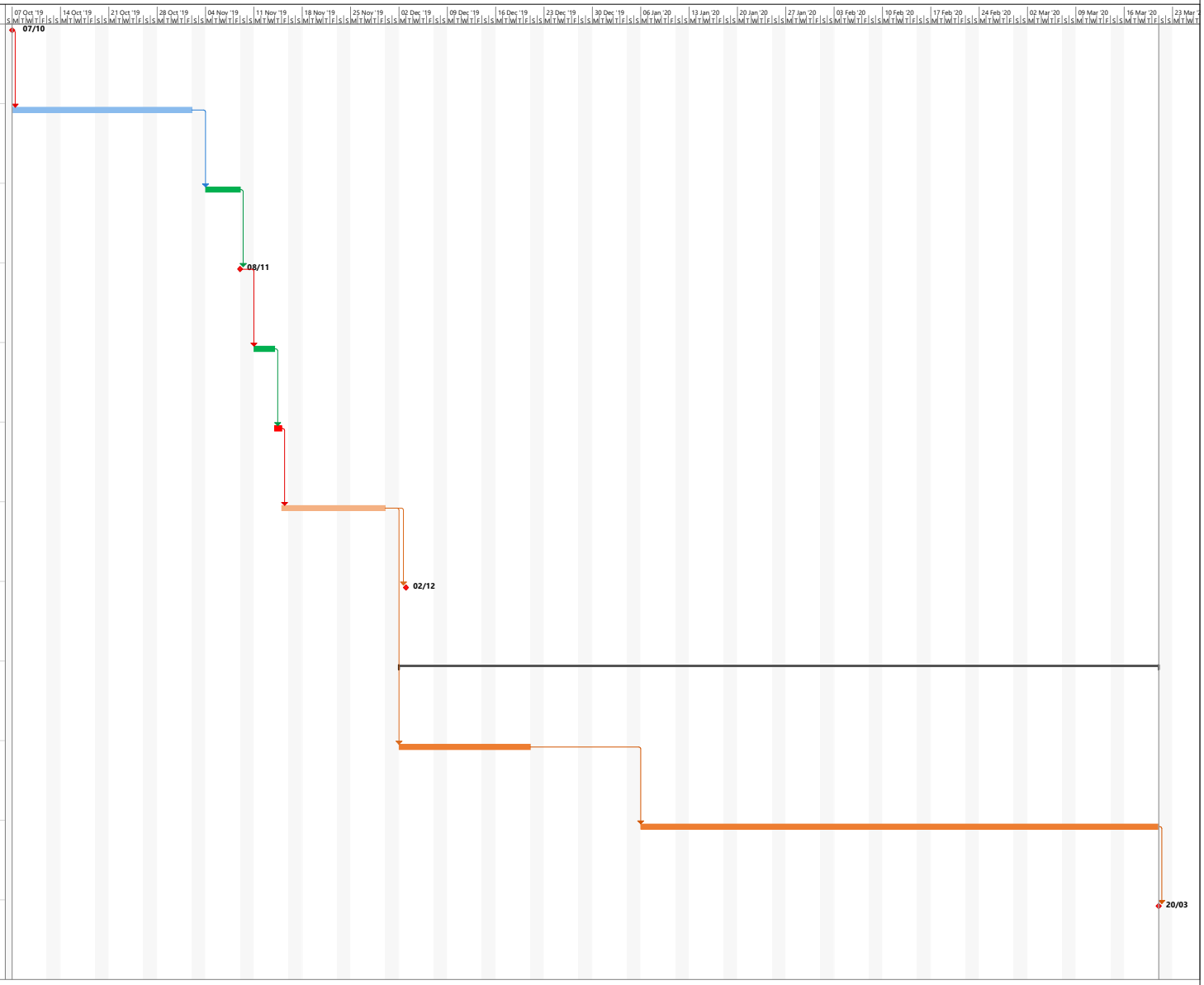
Planning and Sustainable Development Service
Cornwall Council
Dolcoath Avenue Camborne Cornwall TR14 8SX
planning@cornwall.gov.uk

Appendix Q. Key Date Programme

Trewirgie Junior School
New Classroom Building
October 2019

Key Date Programme

ID	Task Name	Duration	Start
1	**Tender Issue**	**0 days**	**Mon 07/10/19**
2	Tender Period	20 days	Mon 07/10/19
3	Tender Evaluation	5 days	Mon 04/11/19
4	Issue Tender Evaluation Report	0 days	Fri 08/11/19
5	Decision to proceed	3 days	Mon 11/11/19
6	Tenderer Notification	1 day	Thu 14/11/19
7	Mobilisation Period	11 days	Fri 15/11/19
8	**Start on site**	**0 days**	**Mon 02/12/19**
9	Construction Period	80 days	Mon 02/12/19
10	Construction Period 1 (pre-Christmas)	15 days	Mon 02/12/19
11	Construction Period 2 (post-Christmas)	55 days	Mon 06/01/20
12	**Practical Completion and Handover**	**0 days**	**Fri 20/03/20**



Project: TJS - New Classroom B
Date: October 2019

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

Appendix R. School Site Policies

Trewirgie Junior School
Contractor Health &
Safety Induction Booklet

Trewirgie Junior School

Falmouth Road
Redruth
Cornwall
TR15 2QN

Business Manger: Mrs. Nicola Dann 01209 215238
Site Manager: Mr. Ross Dimmock 07595 647577
Office Manager : Ms Michelle Cunningham 01209215238

Table of Contents

1. Introduction

Trewirgie Junior School is committed to ensuring that the health, safety and welfare of its employees, students, contractors and visitors is not adversely affected as a result of the work it does or by the condition of its buildings.

The Contractors Health and Safety Induction booklet has been produced to assist the school in making contractor's aware of the hazards present on site, our safety arrangements and emergency procedures.

The information contained within this booklet has been produced to provide contractors with key information that will help them protect their own and others health and safety when working at the school. This information is not intended to be exhaustive and should you have any queries or concerns while working you must stop work immediately and seek further advice and information from the site manager.

Each contractor is responsible for ensuring that each of their employees and subcontractors are fully acquainted with the contents of this booklet. Failure to comply or provide competent personnel will prejudice contractors being awarded future work.

2. Parking rules and access to building

Parking is situated at the front of the school. We operate a pedestrian area during school hours 8.30—3.30pm so if access is required by vehicle other than parking at the front of school, i.e. delivering heavy items to the top of school, then the site manager must to be contacted first to ensure that the area is safe.

Driving on site, general rules

- the maximum speed limit for the site is 5mph
- the pedestrian site is strictly a one way system up the slope and SHOULD NOT be approached from the far end of the car park or reversed up
- any reversing vehicles will have a banks man in attendance.
- the use of mobile phones when driving is strictly prohibited.
- parking/driving must be done in accordance with local signs and restrictions

3. Signing in and out

For health, safety and security reasons it is very important that Trewirgie Junior School knows when contractors are on site, where they are, the type of work they are doing and what time they are expecting to leave. A signing in system is to be found in school reception. All contractors are to sign in each day and collect a contractor badge from reception.

Contractors will be asked to provide/produce the following:

- Who it is they are working for?
- Where they will be working?
- Suitable ID and DBS checked
- What type of work they will be doing?
- What time they expect the work to be finished?

To ensure that contractors are safe and have not been injured when working on site it is essential that reception know they have left the site safely.

Please note – on projects where one or more employee is engaged, it is acceptable for one member of staff – usually the Supervisor or Foreman - to sign in/out on behalf of their colleagues BUT it is their responsibility to ensure all of their colleagues have left the site safely. In this instance the Supervisor or Foreman should also provide reception with the total number of employees that will be on site. This includes contractors undertaking work on the grounds where access to the inside of the building is not necessary.

4. Security on Site

Please contact reception for any security problems
e.g. damage, theft or fire etc. whilst on site.

Equipment and Personal Belongings

It is the contractors responsibility to look after their own equipment possessions whilst on site. No equipment/personal belongings should be left unsupervised at any time.

Contractor passes/ID

Contractors should clearly display their contractor passes at all times whilst on site. Failure to do so may lead to the contractor/s being asked to leave site.

Noise and Disturbance

Because of exams and lessons, noise produced as a consequence of work being carried out on the school site can be problematic. Prior to starting work on site you should check with the site manager/reception if there are any restrictions in place e.g. use of radios, time restrictions. Works should be sequenced to minimise disruption at all times.

5. Code of Conduct

Contractors need to work in a way that ensures the health and safety of not only their employees but also the school staff and visitors.
If you have any concerns about safety please contact reception immediately so we can help resolve them. Offensive behaviour of any kind will not be tolerated while on site including swearing, gesturing, shouting or passing comments that are or could be considered to be threatening or of a demeaning or sexual nature.

Dress Standards
Contractors should ensure that their employees and subcontractors are dressed appropriately at all times for the environment they are working in and the type of work they are doing. Wherever possible the company's logo should be prominent on work wear.

Use of Mobile Phones
The use of mobile phones is allowed provided external communication is a requirement of the role they fulfil and that they can be used safely and without disruption to others. Mobile phone are NOT allowed within the school building when pupils are present.

Use of Radios
Radios should only be brought to site if they can be used safely and without disruption to building occupants. If radios are played excessively loud and/or cause disruption, contractors will be asked to remove them from site.

Alcohol and Drugs
Contractors are required to ensure persons affected by alcohol or other drugs are not permitted to carry out work on school grounds.

6. Risk Assessments

The aim is to make sure that no one gets hurt or becomes ill. Accidents and ill health can ruin lives and businesses too. You must ensure Risk Assessments (RA) have been carried out before you commence work at the school.

The HSE recommend the following approach.

The five steps to risk assessment aims to help you assess health and safety risks:

- Identify the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide on precaution
- Record your findings and implement them
- Review your assessment and update if necessary
- Impact to building

When thinking about your **Risk Assessments**, remember:

- It should be specific to the job and the school site
- a **hazard** is anything that may cause harm, such as chemicals, electricity, working from ladders, an open drawer, etc..
- the **risk** is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

All RA need to be submitted to the Project Manager/Supervisor and a copy submitted to the site manager prior to work commencing.

7. Incident/Accident Reporting

In the event that you or one of your colleagues have an accident or are involved in a near miss, dangerous occurrence or other incident e.g. violence, exposure to asbestos etc. while working at the school it must be reported immediately to the site manager or reception, who in turn will report it to the school's Health & Safety Adviser.

In the event of serious personal injury or serious damage to premises, plant or machinery, the area must be cordoned off and left undisturbed and the school's Health & Safety Adviser contacted immediately.

8. Housekeeping and Waste Disposal

Housekeeping is one of the easiest things to get right, so why do so many people get it wrong?

As well as making you and your company look unprofessional, bad housekeeping is one of the biggest causes of accidents work. Poor standards of housekeeping increase the risk of slip trip and fall accidents, fire and occupational diseases.

Ensure your work and rest area is kept clean and tidy, spills are reported and cleaned up immediately and waste is kept secure in skips and disposed of frequently.

When you're finished on site:

- Remove all waste and excess materials
- Make good any damage caused directly or indirectly by your work
- Leave the area safe

9. Fire and Emergencies

9.1 Emergency Evacuation

Upon arrival at site contractors must familiarise themselves with the location of:

- The nearest means of escape - these are indicated with green and white signs
- The assembly point which is located in the rear playground unless working at the front of school where assembly is outside the school gates
- The location of fire fighting equipment
- The location of and means of raising the alarm (usually a break glass)

9.2 Evacuation procedure

In the event of an emergency that requires the building to be evacuated for example in the case of fire or bomb scare a continuous alarm will sound.

If you hear the alarm you must immediately make safe any equipment you are using (as necessary) and leave the building by the nearest exit proceeding to the assembly point.

When at the assembly point try to contact the site manager Mr. Ross Dimmock 07595 647577. You must not re enter the building, even if the alarm stops sounding until you are told it is safe to do so by the fire marshal, the site manager, or a member of the fire service.

9.3 If you discover a fire.

Shout for assistance or operate the nearest fire alarm break glass and evacuate the building as above.

In the case of a fire, only attempt to fight the fire if it is safe to do so and you have been trained to use fire fighting equipment.

As soon as possible after leaving the building you must contact the site

manager 07595 647577 or school office 01209 215238 and provide them with the following information:

- nature of the emergency
- its location
- number of casualties (if any)
- which emergency services are required

9.4 Retention of Fire Safety Systems and Means of Escape

Contractors must ensure that existing fire safety systems, including fire alarms, compartments, signage, fire fighting equipment and means of escape are maintained at all times. If the works require alterations to the systems, alternative suitable arrangements must be made, agreed with the site manager and communicated to the fire response team and building occupants.

9.5 Fire Detection and false alarms

Creating dust and fumes can cause automatic fire detection systems to be activated which in turn would cause a false alarm. In the event that your work is likely to cause dust and or fumes to be produced then you must liaise with the site manager and agree which form of isolation of the fire detection system is most appropriate

9.6 General fire safety do's and don'ts

- Don't block fire escape routes or exits; fire safety signs or equipment
- Don't leave gas cylinders unattended, do not leave them on site overnight
- Don't store flammable liquids near heat sources
- Don't prop open fire doors (with fire extinguishers)
- Don't smoke

10. Asbestos

As the school are owners and occupiers of the premises and have maintenance and repair responsibilities for them, there is a duty to assess them for the presence and condition of asbestos containing materials. This duty is undertaken by Cornwall Council on behalf of the school.

Where asbestos is present the school will ensure that the risk is assessed, that a written plan identifying where asbestos is located is prepared and that measures to manage the risks are set out in the plan and implemented.

All work on the building fabric, services, plant or equipment will be managed and conducted in a way that eliminates or at least minimises exposure to airborne asbestos fibres, so far as is reasonably practicable;

All Contractors must have membership of the UKATA (United Kingdom Asbestos Training Association), or demonstrate an equivalent commitment to training.

Before you are asked to carry out any work on behalf of the school, the site manager will instruct you to consult the school's Asbestos Register. The register is a detailed document of all known asbestos in Trewirgie Junior School's premises. You will also be requested to sign the register to confirm that you have consulted and understood the information provided.

This approach will limit the likelihood that you will encounter asbestos while working at the school but will not completely remove the risk. You must always proceed with caution and should you encounter any material you suspect could contain asbestos you must stop work immediately, vacate the area and inform the site manager.

11. First Aid

Contractors must assess the risks associated with the type of work they do and provide first aid as appropriate

Location of nearest Accident and Emergency Department /Hospital

The nearest minor injuries department is:
Camborne Redruth Community Hospital
Barncoose Terrace
Redruth
Cornwall
TR15 3ER
01209 881688

The nearest hospital is:
The Royal Cornwall Hospital (Treliske)
Penventinnie Lane
Truro
Cornwall
TR1 3LJ
01872 250000

12. Smoking

Smoking is not permitted on any part of Trewirgie Junior School's site and you will be asked to leave site if you are seen to be doing so , at any time.

13. Legionella Awareness

Contractors and temporary staff must formally request permission (before work starts and in good time) from the site manager to work on any of the school's hot and cold water systems.

Before you are asked to carry out any work on behalf of the school, the school employee responsible for the contract will instruct you to consult the school's Legionella Building File.

The file is a detailed document of water management within each building including the risk assessment and testing regime. You will be requested to sign the attendance register to confirm that you have consulted and understood the information provided

It is essential that adequate resources are made available for prevention or minimisation of the risk arising from Legionella within the school. It is important that all personnel whether involved in assessing risk, carrying out precautionary measures, altering or installing new works and/or planned preventive maintenance/ reactive works are competent, trained in Legionella awareness and aware of their responsibilities.

All pipe work must be chlorinated / sterilised before it is connected to domestic hot/cold water services to prevent contamination. Contractors must ensure that basins, baths WC cisterns showers etc. that have been taken out of commission within the working area which are not used on a daily basis are flushed for at least three minutes weekly and a log of compliance is maintained.

Legionella risk assessment and schematic drawings must be updated to reflect any alterations that have been carried out.

14. Permits to work & other controlled activities

Some work activities or locations are considered to be so potentially dangerous e.g. roof work, work on fume cupboards, work in confined spaces, hot work, digging etc. they are strictly controlled with the use of “Permit to Work Systems” or other control systems.
The Permit to Work procedures and other control systems lay down specific ways that things must be done to minimise the risks associated with the work you do, the environment in which the work is being done or a combination of both.
Where a permit to work or other control system exists for a particular type of work or location you must use it. The site manager will be able to provide you with the necessary permits

Hot work

Hot work, such as welding, grinding, braising, heating etc. must not take place in any building without a permit; to attain a permit Contractors must contact the site manager . Hot work must cease at least two hours before the end of the working day.

Excavations

Before work commences, the contractor must consult the site manager to authorise the work and advise on the existence of electrical cables, drains, gas, water mains etc. that may be affected.
There will also be the risk of undocumented services and contractors risk assessments and method of working should adequately address this risk. All trenches and excavations must be adequately shored and falls of material prevented by “battering back” with cuissons or other effective means.
All excavations must be adequately fenced and when considered necessary, red lamps or flashings must be used during the hours of darkness to highlight the excavation.

14. Permits to work & other controlled activities– continued

Working at Height & Roof Work

Contractors must ensure that all work at height is risk assessed and that it complies with the requirements of the Work at Height Regulations 2005 and that only access equipment appropriate for the task is used taking into account the activity, the tools being used, the duration of the task and the environment

Electrical Work

The school is committed to providing for the safe operation and maintenance of electrical systems and to ensure all electrical systems are managed without giving rise to danger.

It is the duty of any contractor to ensure that any employee working on electrical systems is thoroughly conversant with all legislation governing the work and is trained and competent to do so.

No-one will work on any low voltage systems (50v-1000v ac) unless authorised to do so by the site manager and any electrical equipment brought to site must be low voltage. The University's Electrical Safety Policy and House Rules can be accessed from the University employee responsible for the contract.

Danger Boards

In the event of a "DANGER" board being attached to any electrical or mechanical equipment the contractor must contact the site manager to commencing work.

14. Permits to work & other controlled activities– continued

Entry to Confined Spaces

Contractors' employees must not enter any tank, pit chamber, pipe, funnel or similar confined space where there may be a build up of hazardous fumes or lack of oxygen without the permission of the site manager.

If such permission is granted a suitable and sufficient risk assessment and method statement must be submitted prior to the work commencing.

Working Equipment

You must:

- Ensure that all plant, tools and equipment are in a safe condition to be used.
- Carry out regular inspections to ensure plant and equipment remains safe to use and make a record of this.
- Only use equipment for the purpose for which it is intended.
- Only use equipment if you are suitably trained and competent and have authorisation to do so.
- Only use electrically powered work equipment which is either battery operated or uses 110 volts.
- Ensure that where step down transformers are used, they are positioned as close as possible to the 240 volt supply.
- Ensure all equipment containers are labelled with your details.
- Ensure all plant and equipment is tested, calibrated, serviced and/or maintained.
- Ensure all portable electrical equipment or extension leads have undergone satisfactory Portable Appliance Testing (PAT).

15. COSHH—Control of Substances Hazardous to Health

There are a large range of hazardous substances, including chemicals, stored and used at the school. School Employees and contractors should be aware of this and ensure the work area is safe.
All Contractors must ensure that COSHH assessments are available and followed for all substances hazardous to health being used or produced as a by-product of the work activity. Chemicals or substances de-canted into unmarked containers are not permitted on site.

Please provide copies of COSHH assessments to the site manager before work commences.

16. PPE—Personal Protective Equipment

Contractors must also wear all PPE specified in their own risk assessments and COSHH assessments.

17. Useful Telephone Numbers

Site Manager—07595 647577
Security Control (Kestrel Security) - 01209 313125
Business Manager—01209 215238
School Office—01209 215238
Emergency Services—999

Produced by Michelle Burton Office Manager
Revised May 2019

Trewirgie Junior School

Contractor's Management Policy

Introduction

Trewirgie Junior School regularly makes use of contractors for services which cannot be provided in-house. A contractor is 'any individual or company who fulfils a contractual obligation between the school and a third party organisation'. Contractors will typically carry out their activities on school premises, but may be working on behalf of the school off site, e.g. a coach company engaged to take pupils on a field trip. On occasions, it may be prudent to regard an individual as a contractor even though no formal contract exists, e.g. a sales representative carrying out a survey on site as part of a pre-tendering process.

When contractors are working on the school site or on behalf of the school, the school has a responsibility in law to ensure, as far as reasonably practicable, that no one is harmed or harassed by the activities of contractors and that individual contractors are not harmed by the activities of the school.

Purpose

The purpose of this policy is to establish the school's standards and procedures in the management of contractors, to ensure the school does not expose contractors to unmanaged risk and that contractors carry out work in a safe and suitably controlled manner.

Scope

This policy is intended to cover the activities of contractors working for the school. The following groups/individuals may be regarded as contractors (the list is not exhaustive):

- Building and engineering contractors
- Consultants (of any kind)
- Medical advisers
- Surveyors
- Telecoms engineers
- Staff training companies
- Travel companies
- Visiting academics
- Window cleaners

The following groups/individuals would not normally be regarded as contractors:

- Any person with which the school holds a contract of employment, including part-time & temporary staff

- Salespersons or representatives of companies, schools, parents or other partner organisations providing they are accompanied by a member of school staff when on site

Responsibilities

Responsible Person	**Responsibilities**
Headteacher School Business Manager	Overall responsibility for all school activities • Ensure through effective delegation that contractors are suitably managed • Ensure that each contract is under the control of a competent Contract Supervisor (CS) • Ensure that if the CS is absent during the contract, a suitable deputy is appointed • To advise, on request, on issues relating to health, safety and welfare in respect of contracts and work undertaken
Contract Supervisors	• Ensure that contractors are suitably qualified for the contract in question • Ensure the contractor has suitable insurance cover • Ensure contractors are given an appropriate induction on first arrival and at certain intervals thereafter; or that a representative from the contracting organisation has received an appropriate induction and is responsible for ensuring arrangements are in place for this to be cascaded to all staff who will be working on school site • Ensure a record of induction is kept • Ensure contractors provide all necessary documentation including risk assessments and method statements as necessary • Ensure that any risk assessments & actions that are the responsibility of the school are carried out • Ensure contractors are informed of any significant hazards they may face while at work, e.g. asbestos, live electrical installations • Ensure, so far as is reasonably practicable, that contractors are made aware of any other works ongoing in the vicinity which may impact on their activities, health & safety • Organise IT access for the contractor, if required, by liaising with ICTS in advance • Ensure, so far as is reasonably practicable, that any members of staff likely to be affected by the contractors activities are advised in advance • Ensure that if they plan to be absent during the contract period a suitably qualified

	deputy is appointed & the School Business Manager is informed • To advise on issues relating to Equality & Diversity as they relate to Contractor Management
School Reception	• To act as a primary point of contact for contractors • Monitor the signing in/out system • Provide contractors with badges/car park passes as appropriate • To act as a communications link between contractors, school staff or students and the Contract Supervisor
Site Manager	• To advise on any matters relating to waste management and sustainability, in relation to contracts • To ensure ALL contractors are enlisted on the schools contracts register prior to work commencing
ICT Technician	• To provide the contractor with IT access, on request
All staff	• Must be mindful of the activities of contractors • Must not take actions which may put contractors at risk • Must inform the school (through Reception, the contract manager or School Business Manager) if they observe contractors engaged in any activity which gives them cause for concern.
Contractors	• Must sign in and out on arrival and departure from school respectively • Must abide by all terms and conditions placed on them by the School • Must abide by their own risk assessments and method statements • Must ensure that all contractors employees working on site have received a suitable induction • Must ensure any subcontractors are appropriately qualified and are managing risks through the use of method statements and risk assessments • Must ensure any subcontractors receive an appropriate safety induction on first arrival and at appropriate intervals thereafter • Must inform the CS of any changes they make to work plans, method statements or risk assessments • Must inform the school of any accidents or incidents occurring during the contract

Legislation

The principal pieces of legislation relating to contractor management are:

- The Health and Safety at Work, etc Act 1974
- The Management of Health and Safety Regulations 1999
- The Construction, Design & Management Regulations 2007
- Equality Act 2010

Contractor management – before contract

The school must appoint a Contract Supervisor who will manage the contract. The Contract Supervisor should be suitably competent; able to scope and monitor the work of the contractor. Contractors selected must be suitably qualified and competent to undertake the intended task.

The Contract Supervisor may consider the following evidence when determining contractor suitability:

- Qualifications
- Membership of professional bodies
- Listing on professional registers
- Membership of Constructionline
- References from previous clients
- Previous work carried out for the School
- Risk assessments and method statements
- Equipment & machinery certificates
- Training records
- Insurance

The Contract Supervisor must ensure the contractor understands the scope of the work to be completed and is aware of any specific safety or operational considerations identified. The Contract Supervisor will determine what level of supervision will be appropriate for the contract in question. The Contract Supervisor will identify any IT requirements and ensure these are communicated to the schools ICT technician in good time

Where appropriate, if hazards are significant, the contractor must supply risk assessments and method statements detailing how the work will be done. The risk assessments/method statements must be considered and any concerns discussed with the contractor. Work which will always require a risk assessment and method statement includes:

- Work at height
- Work in confined spaces
- Work with hazardous substances, including asbestos
- Construction
- Equipment servicing
- Grounds keeping
- Work with live electrical equipment/high voltage equipment
- Lifting operations
- Work with pressure systems

- Hot work (welding or cutting, but not usually soldering)
- Excavation
- Demolition

Work which would not normally require a risk assessment would include:

- Lecturing (with no practical component)
- Staff training

Risk assessments must be provided prior to work commencing wherever there is a significant risk, regardless of the nature of the activity.

The Contract Supervisor must ensure that any risk assessments and agreed actions which are the responsibility of the School are carried out

The Contract Supervisor must determine whether any Safeguarding issues will arise and take appropriate steps to protect the health, safety & welfare of children, young persons or vulnerable adults

The Contract Supervisor must ensure the contractor is aware of their responsibilities in respect of Equality & Diversity legislation

The Contract Supervisor must ensure the contractor receives an induction on or before their first day working at the school and a record must be kept (see Appendix B: Contractor Induction Form). Individual contractors used regularly do not need an induction every time they work on site, but should receive updates at appropriate intervals. In the case of large or regularly used contract organisations it is acceptable to provide induction training to a responsible member of the contractor's staff, who will then bear responsibility for inducting other employees of the contract organisation. The induction will be appropriate to the level of hazard and risk involved in the work activity

The Contract Supervisor must ensure that a plan is in place for the disposal of any waste generated during the contract

The Contract Supervisor must agree security and storage with the contractor especially with regard to hazardous substances and equipment and must agree the means and responsibilities for cordoning off the work area if required.

Contractor management – during contract

1. If working on-site:
    - The contractor must report to reception on first arrival (this may not be necessary during the remainder of the contract)
    - Once signed in the contractors will be provided with a badge indicating that they are a contractor. Where appropriate, the contractor may be asked to wear a Hi-Viz vest, to ensure they are readily identifiable

Contract Supervisor (CS) will perform the site induction if not already done and will ensure that the contractor knows what they are doing, where they are going and the nature of any hazards which might be present. The induction should include:

- Hazards on site (presented on a map / plan of the building wherever possible)
- Site rules and safety procedures
- PPE

- Any special equipment they may need to use
- What to do in an emergency
- The sound of the alarm, and how to respond to it
- Issues of lone working and the use of a buddy system e.g. security / reception

The contractor will carry out their task as detailed in any risk assessments, method statements or lesson plans agreed with the School in advance. If the contractor needs any information during the contract, they must direct all queries to the CS or their nominated deputy in the first instance.

If any member of staff needs information about the contract they should speak to the School Business Manager in the first instance. The contractors work will be monitored in accordance with the health, safety and welfare requirements of the risk assessment and method statements.

On completion of the contract the CS will meet with the contractor, check that work has been completed, work areas are tidy, the work area is secure and resolve any issues which have arisen

Contractor will return to Reception, sign out and return the Contractor badge

2. If working off-site:

Contact must be established between CS and contractor – a date and time for the commencement of the activity must be agreed. An induction may not be necessary, but the contractor must still receive the school's Code of Conduct for Contractors. The contractor will work according to the schedule, risk assessment or method statement agreed with the CS before the contract commenced. On completion of agreed work the contractor must contact the CS to sign off.

Contractor management – post contract

The CS in association with other stakeholders will determine whether the contract has been completed satisfactorily. If necessary the CS will make contact with the contractor and deliver any feedback.

The contractor may be called back in to complete remedial works, if necessary.

Policy Date: May 2019

Review Date: May 2022

Signed Headteacher……

Signed Chair of Governors……

Appendix 1

Duties of the Contract Supervisor

The Contract Supervisor acts as the main point of contact between the School and the contractor. They are appointed (or appoint themselves) because they have skills and expertise to ensure that the contract is carried out safely, efficiently and to the satisfaction of all parties. If, during a contract, a Contract Supervisor is no longer able to carry out their duties, due to absence or work commitments, they must appoint a suitable deputy to take their place.

The Contract Supervisors main duties are to:

- Ensure that a suitable contractor is appointed
- Review any documents provided by the contractor
- Be satisfied that any issues relating to health, safety and waste management are adequately controlled, through the use of risk assessments, method statements and prior agreements as necessary
- Ensure that the contractor has received an appropriate induction and signed the 3rd party statement on equality & diversity
- Greet the contractor on first arrival and ensure that they know where they are going and what they are doing
- Ensure the contractor is given all necessary badges, keys and documentation
- Be contactable throughout the contract for any queries from the contractor or others
- Liaise with the contractors from time-to-time to ensure the contract is progressing smoothly and without incident
- Ensure the contract is signed off appropriately
- Ensure all work has been completed to a satisfactory standard and in a timely manner

Appendix 2

Contractor Induction Form

Any contractor working on school site should receive a copy of the school's contractor Health & Safety Induction Booklet, explaining where to find refreshments and welfare facilities, what to do in an emergency and who to contact if they have any queries. They will also receive a copy of the contractor registration and induction form which they must complete and return to school before work commences. Electronic and paper versions are available from the school office.

The Contract Supervisor must run through the induction information with the contractor. The contractor must retain a copy for reference; it will provide them with all the basic information they need to work on site. The contractor must sign to say they have received the information.

Appendix 3
CONTRACTOR CODE OF CONDUCT

On Arrival

- You must observe the school site speed limit – 5mph
- You must report to school reception, or your agreed contact (Contract Supervisor) to sign in and be issued with your school contractor badge.
- Your Contract Supervisor (CS) will ensure you receive all relevant information, including a site induction and keys if necessary
- You must not start work on any part of the school site if you have not received an induction
- You must not enter any hall of residence without express permission

On Site

- Normal working hours – these will be agreed between you and your CS
- When on site your visitor badge should be clearly visible at all times
- You must not drink alcohol or in any way cause a nuisance when on site
- You will abide by the School's Third Party Equality &
- Diversity Agreement (copies available from the school reception)
- All staff, students and others on site are to be treated with due courtesy
- The school will not tolerate the use of racist, sexist or other discriminatory language or behaviour
- The school has a legal duty to ensure the health, safety and welfare of all children, young people and vulnerable adults accessing its services and facilities. You are expected to conduct yourself in accordance with the school's Safeguarding Policy (available on the school website or from the school reception)
- All materials and tools are to be stored safe, inoperable and secure so as not to create a hazard to others
- You must abide by any security protocols entrusted to you and ensure that buildings are maintained in a secure state, as far as is reasonably practicable
- You must ensure that your work area remains safe at all times and if necessary, restrict access to hazardous areas through the use of barriers and signs
- If you have any concerns regarding the safety of equipment or supply, or you make any equipment or supply unsafe, or you need to disconnect equipment or supply; contact your CS or nominated representative
- Any damage to property of the School, School staff, students or others must be reported to your Contract Supervisor

On Completion

- On completion of the job, you must remove all your equipment, surplus materials and waste. The work area must be left clean and tidy. Any equipment or materials belonging to the School, must be returned to the School
- Prior to leaving site you must brief the Contract Supervisor or their representative, reporting what works have been undertaken and what parts have been used. If you have not been able to complete the task you must advise the CS of any follow up visit.
- The CS, or representative, may wish to inspect the work area after completion of the work.

- Finally, you must return your school contractor badge and sign out.

I agree to abide by this code of conduct

Signed:

Name (print):

Date:

On behalf of all employees of (name of contracted organisation):

Copies to be retained by contactor & Contract Supervisor

EQUALITY & DIVERSITY STATEMENT
Third parties who are engaged in business on behalf of Trewirgie Junior School

The School is committed to creating a positive environment where everyone is treated with dignity and respect and is supported in the development of their studies. The School is committed to challenging and tackling discrimination and to actively promoting equality and good relations across all areas of its activity including:

- Admissions and access
- Student achievement and assessment
- Student development and advisory services
- Teaching and learning
- Curriculum and curriculum development
- Staff recruitment, professional development and support
- Partnerships and community links and community cohesion
- Procurement and outsourcing
- Quality and standards assurance

1 The Third party agrees to comply with the School's policies and procedures to prevent unlawful discrimination on the grounds of gender, race, disability, sexual orientation, gender reassignment, pregnancy and maternity, marital status / civil partnership, age, and religion or belief (or a lack of belief).

In accordance with its responsibilities under the Equality Act 2010, the third party will, on behalf of the School, in its actions and engagements with anyone connected to the School (be they staff, students or uses of the School facilities):

- Promote equality and diversity rather than just avoid discrimination;
- Ensure that policies and practices that may seem neutral do not have a disproportionate impact on staff or students because of a protected characteristic;
- Take action to ensure equality exists in practice as proactive support rather than as a response to requests for assistance;
- Monitor our polices for any adverse impact and celebrate good practice and share this with others;
- Ensure that diversity and inclusion are integrated into the school's work and activity – in policy, spending, service design and delivery.

2 The Third party warrants that its own practices and procedures comply with legislation to prevent unlawful discrimination and that its employees are aware of matters relating to the prevention of unlawful discrimination. The Third party is aware of the need to prevent "Third party harassment" of school's employees or those who receive services and goods from the school.

3 The Third party will provide such information as required by the School in relation to its compliance with anti-discrimination legislation and will co-operate with any investigation by the School or a body empowered to carry out such investigations under the relevant legislation.

4 Where any investigation is conducted, or proceedings are brought which arise directly or indirectly out of any act or omission of the Third party, its agent or sub-contractors (e.g.) and where there is a finding against the Third Party in any such investigation or proceedings, the Third-party shall indemnify the School with respect to all costs, charges and expenses (including legal and administrative expenses) incurred by the School during or in connection with any such investigation or proceedings and further indemnify the School for any compensation, damages, costs or other award the School may be ordered or required to pay a third party.

5 Without prejudice to its remedies set out above, the School may terminate the contract if notice has been given to the Third party of a substantial or persistent breach of this clause providing that a reasonable period has been given during which the breach may have been rectified and the Third Party has failed to remedy the breach within the stated time period.

6 The Third party will comply with the following legislation and its requirements:

- **Data Protection Act (DPA) and Freedom of Information Act (FOI);**
- **Independent Safeguarding Authority (ISA) and the safeguarding of children and vulnerable adults.**

Further information about the requirements under this legislation may be gained from the school reception.

I agree to comply with the legislation as specified above and the requirements contained herein:

Signed
Print name:
Position:
Date:

Trewirgie Junior School

Contractor induction checklist

INDUCTION CHECKLIST*			
Induction completed by:		Induction date	

All elements must be covered with copies of documents provided where required	**Yes**
Contractors handbook	☐
Site rules *(Mandatory PPE, drugs, alcohol, smoking, etc.)*	☐
Site emergency evacuation procedures	☐
Site first aid/ medical emergency procedures	☐
Incident reporting and investigation process	☐
Site sign-in / sign-out register	☐
Overview of general access and restricted access areas	☐
Overview of site hazards including those from work on site	☐
Risk control requirements *(Hazardous chemicals, plant, equipment, excavation, confined space work, etc.)*	☐
Site amenities and facilities	☐
Site parking arrangements	☐
Sub-contractor management processes	☐

INDUCTION SIGN OFF*		
Name	**Role**	**Company Name (For sub-contractors)**

Retention of the Form

The site manager must retain a copy of the checklist and associated documentation.

Trewirgie Junior School

"My best always"

Falmouth Road Redruth Cornwall TR15 2QN
Telephone: 01209 215238 Fax: 01209 315384
Email: head@tjschool.co.uk
Headteacher: Mrs. Jane Sargent

Contractor Registration & Induction Form

Completion of this form is required before a company can be allowed to commence work on the school site.

Company Details (*please print clearly*)

Company Name:		**Telephone No:**	
Address:		**Fax No:**	
		Main Contact:	
		Position Title:	
		Contact Number:	
Postcode:		**Email Address:**	

Business Activity (*please select with a cross which one of the below best suits your business*)

☐ Air compressors	☐ Concreting	☐ Geotechnical Consultant	☐ Roofing
☐ Air conditioning	☐ Construction	☐ Glaziers	☐ Scaffolding
☐ Air Extraction	☐ Cranes/Hoists	☐ Labour Hire	☐ Security
☐ Architect	☐ Demolition	☐ Landscaping	☐ Signage
☐ Asbestos/Haz Materials	☐ Earthmoving	☐ Lawn Mowing	☐ Stonemasons
☐ Autoclaves/Boilers	☐ Electrical	☐ Lift	☐ Telecomm/Data
☐ Battery	☐ Emergency Lighting	☐ Locksmith	☐ Test & Tag Services
☐ Blinds/Curtains	☐ Engineering Consultant	☐ Painting	☐ Tilers
☐ Brick/Block Laying	☐ Environmental Consultant	☐ Pest Control	☐ Transport
☐ Building Mgt Systems	☐ Fencing	☐ Plumbing & Gas fitters	☐ Traffic Consultant
☐ Carpet/Vinyl	☐ Fire Services	☐ Pumps	☐ Water Treatment
☐ Civil Works	☐ Furniture	☐ Refrigeration	☐ Waste
☐ Cleaning	☐ Generators	☐ RO Water	☐ Other

Person/s being inducted (please print clearly)

Person 1 Name:		**Position Title:**	
Person 2 Name:		**Position Title:**	
Person 3 Name:		**Position Title:**	
Person 4 Name:		**Position Title:**	

Company Insurance (please print clearly)

☐ **Public Liability**	**Policy No:**		**Expiry Date:**	
☐ **Workers Compensation**	**Policy No:**		**Expiry Date:**	
Insurers Company Name:			**Insured Amount**	

☐ **We have undergone an external health & safety assessment (please provide copies of any certification)**

☐ **Licences Held By Company (please attach certificate if applicable)**

Licence Type	Licence No.	Expiry Date

Contractor Declaration

Below must be signed once the induction booklet has been read by all concerned. By signing the Contractor agrees to adhere to Trewirgie Junior Schools, Health and Safety policies and procedures.

Name of person making declaration: _____

Position of person making declaration: _____

Signature: _____

Date: _____

Note: the Contractor company will be registered with the school for a period of 24months from the date of signing. It is the contractor's responsibility to inform Trewirgie Junior School of any changes.

Please return via email: rdimmock@tjschool.co.uk

office use only

☐ booklet supplied

☐ contractors policy supplied

☐ contractor and induction sheet supplied

☐ insurances complete

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