

**EMPLOYERS REQUIREMENTS  
FOR  
MECHANICAL SERVICES  
AT  
JOINT ATC / ACF CANTERBURY**

**Project N°: 2907  
Revision: C1  
Date: 02/09/14  
Client: SERFCA**

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### DOCUMENT REVISION SHEET

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### REVISIONS

<b>Rev.</b>	<b>Pages Revised &amp; Re-Issued</b>	<b>Date</b>	<b>Ckd.</b>
P1	Preliminary Issue	23/05/14	NC
T1	Tender Issue	06/06/14	NC
C1	Contract Issue	02/09/14	NC

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## **PART 1 - GENERAL DESCRIPTION OF INSTALLATIONS**

### **1.1 GENERAL DESCRIPTION OF DEVELOPMENT**

The site is a cadet training facility utilised by both the Air Training Corps [ATC] and the Army Cadet Force [ACF] located within Leros Barracks, Canterbury.

There is a single existing building on the site which is to be removed and replaced.

The new building will be single storey of steel frame construction with steel cladding and comprises stores, lecture/class rooms, offices and sanitary facilities.

As part of the contract, a band equipment store is also to be constructed as an extension to a separate block.

### **1.2 SCOPE OF WORKS**

The works described in this document include; disconnection and making safe of existing incoming services prior to demolition of existing building, preparation of the site for new building, modification of incoming water services, air source heat pump installations, electric heating, domestic hot and cold water installations, mechanical and natural ventilation systems, automatic controls and the above ground soil and waste systems.

The works will include the design and selection of systems and plant, liaison with the Employer's appointed consultant to ensure compliance with these requirements, installation and commissioning and the provision of all relevant documentation for the works. The described systems will be maintained by the installing contractor for the duration of the defects liability period. Operating and Maintenance manuals and building log books will be provided at practical completion. Make quarterly visits to check for the correct operation of all equipment and carry out adjustments as necessary.

All installations will employ modern technology and controls to achieve minimum energy and water consumption. Sustainable principles will be used throughout the design. All installations must be reliable, durable and safe and easy to maintain.

### **1.3 BUILDING REGULATION PART L COMPLIANCE**

Provide necessary information and documentation as required to allow others to undertake the SBEM and EPC calculations to show Building Regulations Part L Compliance.

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#### **1.4 INCOMING WATER SUPPLY**

The existing incoming water supply is fed from the boiler room within Block C and runs below ground across the courtyard, then enters the existing building at the front of the property.

Prior to demolition of the existing buildings trace pipework back to outside of the proposed foundations of the new building, valve off and isolate for future reconnection.

To supply the new building, extend new below ground pipework from the valved supply terminating inside.

#### **1.5 EXISTING GAS SUPPLY**

A below ground gas pipe currently extends to the outside of the existing building, it is believed that it is redundant and isolated at source. Prior to demolition of the existing building, confirm that the pipework is redundant and isolated and strip back to beyond the proposed foundations of the new building.

#### **1.6 HEATING SYSTEMS**

Provide heating to the ATC / ACF building and band store via a combination of air source heat pumps (ASHP) and wall mounted electric panel heaters dependant on the room usage.

Air source heat pump installation will be a complete VRF type system comprising of external condensing unit linked to either wall mounted or ceiling cassette indoor units. Mount the outdoor unit in a proprietary security cage. Run all condensate pipework under gravity within ceiling voids, provide condensate pumps to wall mounted units to lift condensate into ceiling void.

Provide electric panel heaters with protective wire mesh guards and affix suitable warning notices.

Provide all heating systems with thermostat control, 7 day time clock control and manual override.

#### **1.7 COLD WATER SERVICES**

The building will be served by mains cold water to ensure water quality and pressure.

At the incoming water location, provide stopcock, drain cock and pressure reducing valve then extend cold water services to each draw-off and service throughout the buildings.

Provide isolation and automatic flow control at each draw-off.

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Fittings will be provided to avoid Category 5 backflow risks, where required.

## **1.8 HOT WATER SERVICES**

Provide hot water to sinks and basins via mains pressure electric water heaters mounted locally either below basins / sinks or in cabinets, heaters may serve more than one sink if output and outlet run lengths are acceptable.

Extend from water heater via blending valves to serve hot outlets. Provide 7 day time clock control for each water heater

## **1.9 VENTILATION**

Occupiable rooms will be naturally ventilated, by manually opening windows and rooflights.

Provide extract ventilation to sanitary accommodation via ceiling mounted extract fans initiated via a PIR occupancy detection with adjustable run on timer, duct fans through ceiling void to external terminals.

Provide extract ventilation to kitchen via ceiling mounted, extract fans ducted to external terminal. Control the fan via wall mounted on / off switch.

## **1.10 ABOVE GROUND DRAINAGE**

Provide above ground uPVC soil and waste drainage to meet Building Regulations requirements.

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## **PART 2 - MECHANICAL SERVICES DESIGN**

### **2.1 SCOPE OF CONTRACTORS DESIGN OBLIGATIONS**

This section of the Employer's Requirements defines the performance criteria to be achieved in the completed installations and the standards to be used and the presentation format required for the Contractor's design information. The Contractor will be responsible for producing and presenting to the Employer's representatives a suitable design solution for the installations compliant with these Employers Requirements. Design solutions will comprise drawings, calculations, equipment schedules, loadings and capacities, and locations of all plant and equipment, including specialist equipment being supplied by the Client.

The submitted design may be subject to development before final completion due to co-ordination requirements, overall budgetary restraints or value engineering. Where changes agreed by the Employer's representatives would result in the expressed Employers Requirements not being met, the Contract Administrator will issue a change order varying the Requirements.

The Contractor will also be responsible for assessing the performance of the proposed design and demonstrating to the Employer and his representatives before installation that it meets published benchmarks for energy efficiency and sustainability.

The Contractor will liaise and discuss fully with the Employer's representatives all aspects concerning the services design and installation.

### **2.2 REFERENCE GUIDES AND PUBLICATIONS**

Ensure that all work conforms to current editions of the following standards:-

- Joint Services Publications (JSP'S)
- British Standards
- Building Regulations
- CIBSE Design Guides
- Clean Air Act 1993
- The Control of Pollution Act
- COSHH Regulations
- Construction Design Management (CDM) Regulations 2007
- Electricity at Work Regulations 1989
- Gas Safety (Installation & Use) Regulations
- Health and Safety at Work Act 1974
- H & SE Codes of Practice including "The Control of Legionellosis" L8
- HVCA Codes of Practice
- Institute of Plumbing Design Guide
- Water Supply (Water Fittings) Regulations 1999
- WRc Directory

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If a conflict arises between these specifications, advise the Engineer accordingly.

### 2.3 INFORMATION TO BE PROVIDED

Submit the following information for approval:

- Design Drawings indicating proposed design philosophy, flow rates and configuration of all proposed systems including system schematics
- Working drawings co-ordinated with building fabric, structure and other trades and incorporating key site dimensions to provide a neat & workmanlike installation.
- Builderswork drawings showing all requirements associated with the services installations. These are to be at a scale of 1:100 with specific details at 1:20
- Schedule of all proposed plant and equipment, detailing manufacturer, reference number, duties, electrical requirements and accessories. Indicate where alternatives to the preferred manufacturers in this specification are offered.

Full design calculations for Mechanical Services systems, including:

- Heat Loss (and Heat Gains where appropriate)
- Air Source Heat Pump Sizing (Internal & External)
- Electric Heater Sizing
- Ventilation Fan Sizing
- Ventilation Ductwork Sizing
- Cold Water Pipe Sizing
- Hot Water Pipe Sizing
- Hot Water Heater
- Automatic Controls Descriptions of Operation for each system
- Automatic Controls Wiring Systems



## 2.4 PROGRAMME AND DOCUMENT CHECKING

Prepare a schedule, consistent with the main contract programme, detailing when all drawings and calculations will be issued. When issuing the drawings/calculation schedule, identify the extent and purpose of the particular issue, and the approval status of all drawings.

Present all drawings and calculations in duplicate, in a legible, collated format, along with all data sheets and information relevant to the selection and performance of the given equipment. Allow at least seven working days for the approvals period.

The Employers representative may request the amplification of any detail considered inadequate or may challenge the results of the calculations, in order to verify the validity of the design. Approvals shall be attained on a systematic basis generally as outlined below.

The Employers representative will review the drawings, assign comments, and where necessary, depending on the content of the comments, assign a recommended comment status, i.e. as follows:

- Category 'A' - No comment, proceed with installations
- Category 'B' - Proceed with installation works, subject to the incorporation of the given comments. Re-submit drawing for 'A' status approval.
- Category 'C' - Rejected. Resubmit for further scrutiny, incorporating given comments. Do not proceed with the installation works.

Until such times as the drawings have attained Category 'A' or 'B' status, stamp the drawings "Issued for Approval".

Stamp all drawings which have attained 'A' or 'B' status "Issued for Construction".

Submit all drawings detailing plant and equipment supplied/installed by specialists Sub-Contractors for comment.

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## 2.5 DESIGN PARAMETERS

Use the following design parameters for the Mechanical Services installation:

<b>Description</b>	<b>Design Parameters</b>
Internal (Dry Resultant) Space °C	As Room Data Sheets
Winter Outside Design °C	-4°C
Summer Outside Design °C	30°C db, 20°C wb
Hot Water Generation/Storage °C	60°C
Max. Hot Water at Blended Draw-off Washbasin	41°C
“U” Values	As architect’s schedule
Infiltration Rates	As CIBSE Guide
Heating Excess Capacity	As CIBSE Guide A
Noise Levels	As CIBSE Guide
Pipework Design PD/velocity	400 Pa/m max/1.5 m/s max
Ventilation rates:	As Room Data Sheets
Ductwork Design velocities	3.0 m/s max
Grille/Diffuser selection	To meet noise criteria
External Louvres	1.5 m/s max face veloc. with min free area 50%

## **PART 3 - PLANT & EQUIPMENT STANDARDS**

### **3.1 MANUFACTURERS**

Where manufacturer's products are referred to in this document, they are indicative of the quality of product to be provided. Alternative products of an equivalent quality may be offered but will be subject to approval of the Employer's representatives. Provide similar products from a single manufacturer, where possible, to reduce maintenance problems.

### **3.2 PIPEWORK AND FITTINGS**

**Application:** Buried Cold Water

**Material:** Blue PE80 MDPE to BS EN 12201 Part 2

**Fittings:** PE100 HPPE Electrofusion welding

**Application:** Water

**Material:** Copper tube to BS EN 1057 R250

**Fittings:** Yorkshire lead-free capillary to BS EN 1254 Pt 1

**Application:** Refrigerant Lines for refrigeration units

**Material:** Copper tube to BS2871 Part 2, ASTM 280, DIN1754/8905 half hard tempered.

**Fittings:** Form long radius bends using pipe bender. The use of short radius pre formed bends and elbows should be avoided to minimise pressure drop and possibility of leaks.

**Application:** Condensate

**Material:** uPVC waste pipe to BS4514

**Fittings:** Solvent weld joints

**Application:** Soil and Waste Systems

**Material:** Marley uPVC to BS4514

**Fittings:** Solvent weld joints

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### 3.3 VALVES & ANCILLARIES

Isolation >15mm:	Lever operated ball valve as Crane D171. Provide spindle extension on insulated pipework
Isolation Dom. 15mm:	Broen Ballofix ball valve
Isolation Gas:	Boss 966S ball valve
Isolation & Flow Restriction:	Robert Pearson & Company. Tel: 01985 850954 Basins: RP/ACC VALVE 6 LPM Sinks: RP/ACC VALVE 10 LPM
Non-return:	Crane D140
Drain Cocks:	Broen Ballofix, ball valve DZR
Pressure Reducing Valve	Honeywell D06 with pressure gauge

### 3.4 PIPEWORK INSULATION

<b>Application:</b>	<b>Internal Water Services</b>
Materials:	Zero ODP and GWP<5
Manufacturer & Type:	Rockwool Rocklap
Thickness:	Environmental thickness to BS 5422 2001 edition
<b>Application:</b>	<b>Refrigerant Pipework</b>
Materials:	Armaflex
Type:	Class 'O'

### 3.5 DUCTWORK

<b>Application:</b>	<b>Spiral circular</b>
Type:	Galvanised MS to HVCA DW 144, low pressure

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### 3.6 DUCTWORK ANCILLARIES

<b>Application:</b>	<b>Roof Cowls</b>
Manufacturer:	Vent-Axia
Type:	Roof Termination Set
Size:	To Suit Duct Size and Roof Penetration
Components:	Roof Plate Assembly, Direct Mount Spigot, Adaptor Kit, Roof Cowl, Deflector, and Screws

### 3.7 FANS & ACCESSORIES

<b>Application:</b>	<b>Sanitary Accommodation Extract</b>
Description:	Ceiling mounted extract ducted to roof terminal
Manufacturer:	Vent-Axia
Type:	Centrifugal Extract
Control:	PIR and overrun timer
<b>Application:</b>	<b>Kitchen Extract Ventilation</b>
Description:	Ceiling mounted extract ducted to roof terminal
Manufacturer:	Vent-Axia
Type:	Centrifugal Extract
Control:	On / Off Switch
<b>Application:</b>	<b>Training Theatre supply &amp; Extract Ventilation</b>
Description:	Wall mounted
Manufacturer:	Vent-Axia
Type:	T Series
Control:	Speed Controller, PIR and overrun timer

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### 3.8 HEATING

**Application:** **Air Source Heat Pump Heating**

**Description:** Provide wall mounted and ceiling cassette room units with pipework system to an external condensing unit.

**Manufacturer:** Mitsubishi

**Type:** City Multi VRF System

**Details:** Y Series, Heat Pump, Heating or Cooling

**Indoor Units:** Wall Mounted and or Ceiling Cassette

**Controls:** Hard wired controller providing temperature and 7day time clock control for each indoor unit.

**Refrigerant:** R410a

**Application:** **Electric Panel Heating**

**Manufacturers:** Creda

**Type:** Nobo Panel Heaters

**Description:** Electric Panel Heater

**Controls:** Integral 7 day time clock & thermostatic control.

**Workmanship:** Provide wire mesh guard and traffolite warning notice. (wording to be agreed with client)

### 3.9 PROTECTION

**Application:** **ASHP Condensing Unit Protection**

**Supplier:** Heronhill

**Description:** VRV/VRF Condensing Unit Guard

**Size:** To suit condensing unit

**Details:** Weather protected, steel mesh guards. Epoxy-polyester powder coating, with scratch resistant, textured finish.

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### **3.10 CHLORINATION**

Flush carcassed domestic water systems with chlorine dioxide solution prior to connection to the mains. Chlorinate system overnight on completion with chlorine dioxide solution and provide certification.

### **3.11 BONDING**

Ensure all pipe installations, ductwork and plant are equi-potentially bonded to the structure.

## **PART 4 - STANDARDS OF WORKMANSHIP**

### **4.0.0 GENERAL**

#### **4.0.1 SCHEDULE OF RATES**

When requested, provide a quantified schedule of rates with sub-totals and totals consistent with the mechanical services price.

#### **4.0.2 STANDARDS OF INSTALLATION**

Ensure that all work conforms to current editions of the following standards:-

- BS and BS EN Standards
- Building Regulations
- Water & Water Supply and Fittings Regulations 1999
- Construction Design Management (CDM) Regulations
- Clean Air Act
- Gas Safety (Installation & Use) Regulations
- Electricity at Work Regulations 1989
- HVCA Codes of Practice
- Health and Safety at Work Act 1974
- H & SE Codes of Practice including "The Control of Legionellosis" L8
- Loss Prevention Council Recommendations
- WRc Directory

#### **4.0.3 STANDARDS OF WORKMANSHIP**

Provide a competent supervisor, on site for the duration of the contract, to oversee the works and to ensure that all work is completed in a neat, workmanlike manner. Use only appropriately skilled workmen. Ensure that only CORGI registered operatives work on gas installations. Ensure that only certified operatives work on unvented domestic hot water systems above 15 litres. Ensure that electrical work is only undertaken by an NICEIC or ECA registered contractor.

#### **4.0.4 TOOLS AND KEYS**

Provide all necessary tools and keys for the operation and routine maintenance of the installations. Provide and fix on the wall of the boiler or plant room, a purpose made rack to hold keys and tools.

#### **4.0.5 COMMISSIONING, TESTING AND DEMONSTRATING**

Before commissioning, ensure that all ductwork systems are cleaned, water systems flushed and filled and gas systems purged. Commission systems to comply with the specified design parameters, in accordance with CIBSE Commissioning Codes and manufacturer's instructions. Include for any temporary works, fuel or other consumables required. At completion, demonstrate the operation of the system to the Engineer. Demonstrate the

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operation of the system controls to the user. Allow sufficient time in the programme for commissioning, testing and demonstrating the system.

At four quarterly intervals following practical completion, visit the site and check the operation of each unit's installations. Assess and record user satisfaction with the systems and general standards of comfort.

#### **4.0.6 OPERATING & MAINTENANCE INSTRUCTIONS & HEALTH & SAFETY FILE**

As part of the Health and Safety File, supply two full sets of working instructions for the whole of the plant covered in this Specification prior to Practical Completion. Provide a bound set of User Instructions for each unit in the building. Provide manuals compliant with Class D of the BSRIA Technical Note TN1/84 as explained in BSRIA Application Guide AAG1/87.1 and comprising the following:-

- A full description of the installation, including controls
- Schedules of all installed equipment with figure numbers, duties, electrical details and manufacturer's address and telephone number
- Certificates of Electrical Completion, pressure testing, commissioning, chlorination etc
- Contractor's emergency call-out numbers
- Valve charts
- Gas line diagram
- Instructions for the safe operation of the systems
- Fault finding procedures
- A schedule of recommended daily, weekly, monthly, quarterly and annual maintenance
- Manufacturers maintenance instructions cross referenced to schedule of installed equipment
- A1 'As installed' drawings including manufacturing and control panel wiring drawings folded to A4 size in clear plastic wallets with schedule
- Disposal instructions

Submit draft copy in electronic form approval two weeks before Practical Completion. Provide a hard bound copy of the draft at practical completion for use by the building operator and a bound set of User Instructions for each unit in the building.

Within 14 days of completion of the works, supply one paper copy of the completed document and two electronic copies of the whole manual on CD-ROM in word or PDF and with the 'As Installed' drawings in AutoCAD 14 format.

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#### **4.0.7 BUILDING LOG BOOK**

Provide a building log book for each unit at Practical Completion, set out in an approved format to meet the requirements of Building Regulations Approved Document L2.

#### **4.0.8 DEFECTS LIABILITY**

The whole of the work is to be guaranteed for a period of twelve months, from the date of the Certificate of Practical Completion. The Contractor shall remedy at his own expense all defects in installation, materials and equipment due to faulty design, construction or workmanship which may develop in that period, notwithstanding the fact that the material and equipment is specified in this specification.

Defects affecting the system functionality must be repaired within two working days of them being reported.

#### **4.0.9 MAINTENANCE**

Provide all regular maintenance of the equipment as detailed in the Operating and Maintenance manual including emergency call out for the duration of the Defects Liability period.

## 4.1.0 PIPEWORK

### 4.1.1 GENERAL WORKMANSHIP

Install pipework generally to follow the building line but all vertical pipes are to be plumb. Install pipework to vent and drain naturally, where possible. Install horizontal pipes with a gradient of 1:500 in mains and 1:250 in branches. Where natural venting cannot be achieved, fit automatic air vents. Fit drain cocks at all low points to allow the system to be drained completely.

Space pipes consistently and install un-insulated pipes between 25-50mm clear of walls. Where pipes are to be insulated, ensure finished insulation is 12-25mm clear of walls and 100mm clear of trunking in plant rooms. Run pipes above, not on the skirting.

Use only proprietary pipe fittings. Ensure pipe bends and sets are free from crinkles, flattening, score marks or distortion. Use only equal tees, reducing branch and main pipes not closer than 10 diameters from the tee.

Sleeve all pipework passing through walls and floors with pipe lengths of similar material. Where the wall or floor is a fire partition, pack the annulus between pipe and sleeve with an approved fire-proof packing. Fit split wall plates over pipework at all visible sleeves. Do not joint pipework within the sleeve.

Provide unions at all pipe connections to plant and at other convenient locations to allow pipework to be dismantled.

Avoid contact between dissimilar metals in pipework, fittings or fixings.

### 4.1.2 SUPPORTS

Support pipes at the following intervals;

Mild Steel			Copper		
Nom. Dia.	Vertical	Horizontal	Nom. Dia.	Vertical	Horizontal
15	2.4m	2.0m	15	2.0m	1.2m
20	3.0m	2.4m	22	2.4m	2.0m
25	3.0m	2.4m	28	2.4m	2.0m
32	3.0m	2.7m	35	3.0m	2.4m
40	3.6m	3.0m	42	3.0m	2.8m
50	3.6m	3.0m	54	3.0m	2.8m
65	4.5m	3.6m	67	3.7m	3.0m
80	4.5m	3.6m	76	3.7m	3.0m
100	4.5m	3.9m	108	3.7m	3.0m

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Provide all necessary hangers, brackets, struts and rings for the support of pipework. Do not drill or cut structural members without the approval of the Contract Administrator.

Unless otherwise indicated, use metal split ring, screw fastened clips.

Ensure that pipe supports or clips are adequate for the weight to be carried and that they permit free expansion of the pipework.

#### **4.1.3 THERMAL EXPANSION**

Make all necessary provision for the expansion of pipework due to temperature change. Ensure that pipework is free to move.

#### **4.1.4 STEEL PIPEWORK**

On pipework up to and including 65mm provide screwed joints. On pipework of 80mm and above provide flanged joints.

Cut pipe square and reamer out before screwing ends with a taper thread.

Joint screwed pipework to BS.21 with either P.T.F.E. thread sealing tape to BS.4375 on pipework up to 20 mm unless in the immediate vicinity of gas burning appliances or with best quality fine stranded hemp and suitable jointing compound. Remove excess hemp and compound before painting.

Make flanged joints with flanges to BS.4504 Part 1 & 2 of the appropriate Table and jointed with compressed non-asbestos fibre joint rings. Pull up joint evenly on all bolts.

Provide eccentric reducers where continuous air venting is required in the direction of a reduction. Do not employ bushes to reduce bore on pipe run. Do not use hexagon pattern nipples or site fabricated fittings.

Wire brush loose dirt and rust from pipework and paint with two coats of red oxide paint as work proceeds.

Provide heating cold feed pipes and open vent pipes for a distance of one metre above and below the normal tank water level, of galvanised steel tube to BS.1387 with galvanised malleable case iron fitting to BS.143.

#### **4.1.5 COPPER PIPEWORK**

Make capillary joints by cutting pipe end square with a saw (wheel cutters shall not be employed). Reamer out to ensure full bore and clean plain end. Use only lead free, solder ring fittings with a suitable phosphoric acid based flux to BS.5245, sparingly applied. Make joint in accordance with manufacturers

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instructions. Clean off traces of flux when joint is completed. Do not use end fed fittings, or self cleaning fluxes.

Prepare compression joints as above and make in accordance with the manufacturers instructions. Use only an inorganic, non toxic, non-setting type jointing compound which is WRC approved, as Boss Green or equivalent.

Make screwed joints with PTFE tape or a WRC approved inorganic thread sealing fibre with an inorganic compound. Do not use hemp or Boss White.

Make flanged joints with flanges to BS.4504 part 1 & 2 of the appropriate Table and jointed with compressed non-asbestos WRC approved fibre joint rings. Pull up joint evenly on all bolts.

Provide eccentric reducers where continuous air venting is required in the direction of a reduction. Do not employ bushes to reduce bore on a pipe run.

Do not use hexagon pattern nipples or site fabricated fittings.

Make final connections to taps with a proprietary connector and inorganic fibre washer.

#### **4.1.6 BURIED PIPEWORK**

Ensure buried water pipework has 900mm of cover to protect against frost and traffic damage. Bed MDPE pipework on sand and cover with sand. Lay warning tape in trench above pipe. Compact trench backfill and re-instate original surfaces. Sleeve service entries into buildings and seal gas pipes to sleeve at inside surface. Ensure buried service valves are fully accessible.

#### **4.1.7 PROTECTION AND CLEANING**

Protect open ends of pipework with caps or plugs to prevent the ingress of foreign matter, during the installation stage of the work. Do not use paper plugs, shavings, rag waste or the like.

On completion of each section of water pipework, flush through with clean water to remove grit or other foreign matter.

Clean pipes externally to remove cement and paint.

#### **4.1.8 INSULATION**

Provide and install thermal insulation to pipes, valves and fittings as follows:-

- All heating and primary HWS pipework in boiler rooms, plant rooms, trenches, ducts, voids, boxing, false ceilings, wall chases, store rooms and elsewhere, except for heating pipework used for heating surface.
- All hot water service circulating pipework in any location.

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- Hot water dead-leg pipework in hollow partitions, trenches, ducts, voids, boxing, false ceilings, wall chases, where pipework is hidden and in goods stores and other locations, where the hot water pipework could emit unwanted heat.
- All cold feed and open vent pipework, throughout its length.
- Cold water pipework in ducts, voids, boxing, false ceilings, wall chases, unheated store rooms and other unheated spaces, for frost protection. Cold water pipework in
- plant rooms, boiler houses and in other locations where necessary to protect the cold water from external heat sources.
- Cold water mains pipework where conditions are likely to cause condensation on the pipework. Provide a vapour seal to this insulation.
- Where uninsulated pipework bridges the insulation between a cold void and a warm space.

Carry out thermal insulation work using a specialist firm employing craftsmen skilled in the class of work. Do not apply thermal insulation until installation has been fully tested and all joints proved sound. Ensure all materials are kept dry. Insulate pipes separately. On exposed insulation, neatly finished joints, corners, edges and overlaps to fall on blind side. Ensure overlaps are neat and even and parallel to circumferential and longitudinal joints.

#### 4.1.9 PAINTING

Paint visible ironwork and un-insulated pipework forming part of the mechanical services installation, in boiler rooms, plant rooms, roof voids and tank rooms.

Clean metalwork thoroughly before painting and coat with primer, followed by undercoat and gloss paint.

Paint metalwork black and gas pipework yellow unless otherwise indicated.

#### 4.1.10 IDENTIFICATION

Identify each pipe in a boiler room, plant room, tank room, void or duct for service, circuit and direction of flow using 300mm colour bands to BS.1710.

Apply bands in each room or enclosure, at intervals not greater than 15m, at each valve and junction and at each ceiling, duct or shaft access point.

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Identify each valve, cock and air vent etc, with a securely attached disk engraved with numerical references, except where exposed in occupied areas (unless otherwise indicated).

Provide a printed valve chart for inclusion in the Manuals, identifying each valve by number, purpose and location. Fix in boiler and plant rooms, valve schedules identifying by number each valve in the room. Print valve charts on white, non-fading paper and mount in frameless picture mount, permanently fixed to the wall.

Where valves are provided for emergency shut-off of services, provide and fix adjacent Traffolyte labels engraved red on yellow 'Emergency Shut-Off'.

#### **4.1.11 TESTING**

Test the whole of the heating, and water services pipework installations by hydraulic pressure.

Test gas pipework by pneumatic pressure.

Comply with procedures given in HVCA Guide to Good Practice for Site pressure Testing of Pipework and ensure safety precautions detailed in HSE Guidance Note GS4 Safety in Pressure Testing are adopted.

Provide a blanked connection to accommodate a check gauge in addition to the accurate gauge fitted to the section under test.

Test concealed or buried pipework before any permanent covering is applied.

Advise Contract Administrator, in advance, of the time pressure test may be witnessed. Apply a heating test to all heating and hot water supply systems with boiler temperature in each case maintained at 85 °C for a period of not less than 6 hours. Allow the system to cool down before examining for defects.

If leaks or defects are discovered during testing, re-test following rectification of the fault.

Provide all necessary testing gear, and all labour for tests. Include for testing all systems in sections at different periods of time to suit the contract programme.

Provide a test certificate witnessed by the Contract Administrator, for each test carried out.

Ensure that all items of equipment used in installations are capable of withstanding the test pressure. Isolate existing plant and pipework as necessary to ensure components are not tested to a pressure greater than their age and condition can withstand.

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Apply hydraulic test of 1 hour's duration as follows:-

Operating gauge pressure less than 3.5 bar, test gauge pressure 7.0 bar.

Operating gauge pressure 3.5-7.0 bar, test gauge pressure twice operating pressure.

Operating gauge pressure greater than 7.0 bar, test gauge pressure 14.0 bar or one and a half times operating pressure whichever is the greater.

Apply pneumatic tests of 1 hour's duration as follows:-

Test gauge pressure twice operating pressure

#### **4.1.12 INHIBITOR**

Following testing, dose the whole of the heating system with an inhibitor solution, either as specified or of an approved type suitable for the system. Follow the manufacturers recommendations for solution strength. Label F & E or pressurisation tank or fill point with details of additive and solution strength.

Ensure inhibitor selected is compatible with all components in system.



## **4.2.0 PLANT & EQUIPMENT**

### **4.2.1 HEATING AND HOT WATER SERVICE BOILERS**

Install boilers square on bases or wall. Ensure boiler fronts are aligned and multiple boilers consistently spaced. Allow sufficient space for boiler maintenance. Protect boiler casings until practical completion. Do not fit casings until joints have been tested. Ensure that each boiler is fitted with a safety valve suitable for the system pressure. Provide each boiler with a drain cock. Pipe safety valve and open vent discharges to within 150mm of floor level and bracket bottom of pipe securely to floor. Ensure boiler thermostat pocket is oil filled. Provide a temperature gauge on the flow connection of each boiler. Ensure boiler room is ventilated to BS 6644 or 6798 and that ventilation is unobstructed. Ensure boilers are commissioned by manufacturers.

### **4.2.2 FLUES**

Provide fabrication drawings for flue systems prior to manufacturer, allowing two weeks for comment or approval. Ensure flues are adequately supported without the need for guy wires above roof level. Provide trapped drains to a convenient discharge location to remove all condensate and rainwater from the system. Terminate flues at a suitable distance from upstands/roof pitch to avoid back pressure and to allow flue gases to clear the building in all wind conditions. Unless otherwise indicated, provide a lead flashing sleeve for fixing by others and a flue cravat to ensure that the structural penetration of the flue is weatherproof. Do not locate joints in depth of floor/sleeves. Install with sockets facing upward.

For fanned flues and balanced flues terminating below 2m from ground, fit a secure wire guard over terminal.

### **4.2.3 CIRCULATING PUMPS**

Provide matching flanges for flanged pumps. Ensure that pump is installed in accordance with manufacturers requirements, particularly control box attitude on variable speed pumps. Support pumps independently of pipeline. Provide vibration isolation. Provide a pressure gauge and cock on the suction and discharge connections of each pump or twin-pump.

### **4.2.4 UNDERFLOOR HEATING**

Adjust pipe spacing to meet heating requirements. Provide increased pipe density adjacent to glazed screens and full height windows. Lay insulation, grid and pipework immediately before screeding operation. Pressure test pipework and maintain and monitor pressure during screed laying. Allow screed to dry fully before applying heat. Obtain confirmation from all manufacturers of proposed floor finishes that their product is suitable for

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underfloor heating. Ensure that the flooring manufacturer's instructions for under heated floors are complied with.

#### **4.2.5 SYSTEM PRESSURISATION**

Provide boiler safety valves suitable for the maximum operating pressure of the commissioned system. Wire low pressure contacts to boiler controls to isolate boilers in the event of pressure failure.

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### **4.3.0 VENTILATION**

#### **4.3.1 GENERAL**

Ensure that the installation complies with BS 5720.

#### **4.3.2 SHEET METAL DUCTWORK**

Ensure ductwork is manufactured and installed by firms who are members of the Heating and Ventilating Contractors Association specialising in this particular trade.

Construct ductwork and ensure internal cleanliness in accordance with the Specifications for Sheet Metal Ductwork DW/144 and DW/TM2 (Advanced), published by the Heating and Ventilating Contractors Association unless amended by this Specification.

Provide radius bends wherever possible. Provide turning vanes at square bends and an internal radius of not less than half width at radius bends as Fig.53 (DW.142). Where possible take off branches at reducers and use a radius shoe in all cases.

Isolate all supporting members from the ductwork by a lining of 6mm thick rubber secured to the support by means of adhesive.

Form ductwork from galvanised mild steel to BS 2989, Grade Z, Coating Type G275M.

After construction, make good any area of damaged ductwork and coat joints in accordance with BS 729 using metallic zinc rich priming paint to BS 4652.

Galvanise ductwork to be erected external to the buildings after manufacture.

Ensure ductwork with internal applied protective finishes has the treatment and the method of application to the ductwork in accordance with the protective finish manufacturer's recommendations.

On low and medium pressure ductwork, use the Pittsburgh lock on longitudinal seams for ducts with longer sides up to 1000mm, and use double standing 'S' cleat seams for ducts with longer sides over 1000mm.

Seal and tape sheet metal joints, both cross and longitudinal, with sealants having proven properties of adhesion and elasticity and apply to the cleaned metal or joint by the method approved by the sealant manufacturer to completely seal the joint and make it air tight under the working temperatures and pressures. Seal longitudinal seams to ensure airtightness during construction of the ductwork at works.

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Provide flanged bolted joints for connecting the ductwork to flanged items of plant, builders work frames and where removable sections of ductwork are required.

Ensure flange bolts are not less than 8mm dia. and sheradised in accordance with BS 4921.

Cover and protect open ends of ducts during erection to prevent ingress of dirt and rubbish.

Where moisture is present, arrange the ducting to ensure drainage of any entrained moisture back to washers and sealed drain points.

Where ductwork passes through or terminates in roofs, provide a trimming angle and weather cravat to ensure weatherproof fitting to the building structure.

Where ductwork passes through a wall, floor, roof etc. provide a galvanised sleeve of adequate clearance, packed with fire resisting material to prevent air movement and transmission of noise/vibration between duct and sleeve.

Ensure ductwork does not come into direct contact with the building fabric except in cases of fire dampers, silencers and builders frames.

Fit supports and drop rods clear of the ducts and acoustic/thermal insulation.

Check ductwork and test for air tightness before the installation of false ceilings etc., and the application of insulation. On low pressure systems, carry out smoke tests to the requirement of the Services Engineer.

Provide holes in the ductwork to accommodate the thermostats, etc. specified under automatic control equipment, and fit with screwed bushes brazed into the side of the ductwork.

Provide test points in the ductwork system for complete balancing of the system, at each side of all equipment and upstream of all dampers. Drill 25mm diameter holes and provide with effective seal.

Consult the Services Engineer when considering any change of section from that shown on the drawings.

Fit access and cleaning doors in the ductwork, and located not more than 6m apart. Locate each access door in the ductwork, so that it is fully accessible.

#### **4.3.3 DUCTWORK INSULATION**

Provide and install thermal insulation to ductwork as follows:-

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- All supply ductwork in boiler rooms, plant rooms, voids, boxing, false ceilings, store rooms and elsewhere. Maintain a vapour barrier for ducts carrying cooled air.
- All fresh air intake ductwork up to the first heating coil or heat recovery unit. Maintain a vapour barrier over this insulation.

Carry out thermal insulation work using a specialist firm employing craftsmen skilled in the class of work. Do not apply thermal insulation until installation has been fully tested and all joints proved sound. Ensure all materials are kept dry. Insulate ducts separately. On exposed insulation, neatly finished joints, corners, edges and overlaps to fall on blind side. Ensure overlaps are neat and even and parallel to circumferential and longitudinal joints.

#### **4.3.4 IDENTIFICATION OF DUCTWORK**

Mark each range of ductwork with an identification code illustrating the direction of air flow, what the range of ductwork is serving and the type of air being conveyed.

Provide Identification coding accordance with H.V.C.A. Code of Practice DW/142 Identification of Ductwork.

#### **4.3.5 CLEANING OF DUCTWORK**

Clean out each range of ductwork during the progress of the Contract and demonstrate by removal of access openings for inspection of the systems.

#### **4.3.6 FLEXIBLE CONNECTIONS**

Use flexible ductwork for connecting to various terminal units and equipment subject to vibration, and for final connections to air diffusers and registers, installed in straight lengths only.

Keep the flexible ductwork to a minimum length not exceeding 900mm. Ensure that fire resistance is in accordance with the Fire Regulations and that flexible meets the requirements of air tightness of DW/144 and the temperature and pressure of the system with the minimum frictional resistance.

Ensure that circular flexible ductwork is of the lined type with cuffed ends or equal suitable for connecting to the metal ductwork or equipment with metal clips and if required, suitable jointing compound.

Where the adjoining ductwork or equipment is insulated, wrap the flexible ductwork with 50mm water repellent Rocksil secured with metal bands.

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#### **4.3.7 AIR DIFFUSERS, GRILLES & REGISTERS**

Provide air diffusers or grilles with all necessary suspension brackets, screws, suitable attachments, bolts, nuts and washers to support the grilles to the recommendation of the manufacturer. Support grilles attached to ductwork independently of the ceiling. Provide non-vision grilles with horizontal inverted 'V' section blades. Provide square and rectangular diffusers and grilles with welded mitred corners.

#### **4.3.8 SELECTION OF FANS**

Select each fan to ensure that the specified duty is not on or close to a maximum performance curve.

Ensure each installed fan and fan motor is capable of handling a 15% increase above the specified total pressure at the design volume.

#### **4.3.9 INSTALLATION OF FANS**

Provide flexible connections and resilient mounts to fans. Where fans are installed in ceiling voids, ensure fans are accessible from below.

#### **4.3.10 WINDOW MOUNTED FANS**

Provide window fans, complete with the following:

- a) Automatic draught proof shutter and exterior grille
- b) Electric socket and speed control unit
- c) Window gaskets

#### **4.3.11 WALL-MOUNTED FANS**

Provide wall mounted fans complete with the following:

- a) Finished to prevent rusting
- b) Fixing frame of flanges and wall sleeve
- c) Protection guards
- d) Fans shall be capable of the specified performance when tested in accordance with BS 848, Part 1 and, where applicable, shall comply with the requirement of BS 5285.
- e) External and internal grilles and draught proof shutter.

#### **4.3.12 TRANSFER GRILLES**

Provide transfer grilles as follows:

- a) Of satin finished aluminium or PPC paint finish to Architects requirements.

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- b) Provided with a foam plastic gasket to prevent staining of the wall and ceilings.
- c) Fixed into wood frames with aluminium screws or suitable plated wood screws.
- d) The grilles shall be of the non-vision type
- e) Double grilles shall be of the quick release type.

#### **4.4.0 AUTOMATIC CONTROLS & WIRING**

##### **4.4.1 COMPONENT INSTALLER**

Use a specialist installer to provide controls systems, components and wiring.

##### **4.4.2 WIRING DIAGRAMS**

Submit panel wiring diagrams for comment or approval prior to manufacture. Give full details of internal panel connections, external panel features, external cable sizes and proposed external wiring routes. Allow two weeks for comment or approval.

##### **4.4.3 INSTALLATION WIRING**

Provide power and control wiring to all items of mechanical plant and control components, unless otherwise indicated. Chase walls and provide conduit and boxes for sensors and switches in occupied areas. Co-ordinate chasing and other installation works with other trades.

Carry out wiring strictly in accordance with manufacturers recommendations and the current edition of the IEE regulations. Connect the panel from a supply left by others in the plant room. Segregate extra low voltage wiring from 240v mains wiring.

Provide galvanised mild steel trunking with removable lids and galvanised conduit in plant rooms. Ensure that trunking lid is fully removable and is not obstructed by plant, pipework or insulation.

Wire to remote plant in MICC cable or PVC/SWA/PVC. Wire to sensors in screened cable. Maintain screening continuity to controller with a single earth at the controller only. Mount sensors in plastic boxes only. Run cables on galvanised cable tray and maintain separation between power and screened sensor cables. Check the rotation of all three phase motors.

##### **4.4.4 CONTROLS/COMPONENTS**

Provide all necessary isolators, starters, sensors, relays, protection devices, panels, distribution equipment, controllers, motorised valves, motorised dampers and linkages etc to complete the installation. Make final connections to pumps with a switch operated plug and socket with flexible connection. Ensure twin pump plugs cannot be cross connected. Provide local double pole isolators to all other items of plant with short flexible conduit connections.

Site control sensors as indicated on the drawing or as agreed with the Contract Administrator. Provide suitable pockets for immersion sensors and fill with oil.

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Mark valve and damper motors to indicate the open and closed positions. Provide only plug and seat type control valves. Provide panels with a door interlocked isolator. Where panel doors incorporate a liquid crystal display, install display and mount panel to leave display at eye level. Label each panel door mounted item with engraved plastic labels securely fixed. Provide a 13A switched socket outlet on the side of each panel. Provide a spare fuse of each size within the panel and two spare indicator lamps.

#### **4.4.5 ELECTRICAL BONDING**

Fully earth bond boiler and plant room pipe and metal work installations to meet current electrical regulations. Bond hinged panel doors to panel.

#### **4.4.6 COMMISSIONING AND DEMONSTRATION**

Fully commission the system in accordance with the control manufacturers instruction and the CIBSE commissioning code C, section 2. Allow one days attendance to fully demonstrate the controls to the satisfaction of the Contract Administrator and to instruct staff on the system operation. Demonstrate optimum start operation, boiler boost, weather compensation, frost protection and other system features by simulated starts, loads and conditions.

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## **4.5.0 ABOVE GROUND DRAINAGE**

### **4.5.1 GENERAL**

Ensure all sanitary appliances are provided with new systems of above ground drainage comprising soil and vent stacks, small waste pipes, traps and all fittings etc. Install all wastes in full compliance with all relevant codes and standards. Ensure the drainage system is fully ventilated to atmosphere at critical points, and connects to the below ground drainage system as detailed elsewhere.

Co-ordinate all new drainage runs with the structure and other services, taking account of depths of available service voids etc. Conceal pipes, wherever possible, within service boxings, or where this is not possible, neatly run at low level.

Ensure that all horizontal drain runs are adequately ventilated to prevent noise and the loss of trap seals during multiple discharge conditions.

### **4.5.2 PERFORMANCE CRITERIA**

Install pipework, fittings and accessories to ensure that:

Appliances drain quickly, quietly and completely at all times without nuisance or risk to health.

Discharge is conveyed without crossflow, backfall, leakage or blockage.

Air from the drainage system does not enter the building.

Pressure fluctuations in pipework do not vary by more than +/-38 mm water gauge and traps retain a water seal of not less than 25mm at all times.

The system can be adequately tested, cleaned and maintained without undue disturbance to finishes.

### **4.5.3 INSTALLATION GENERALLY**

Before commencing work, ensure that any specified painting of surfaces which will be concealed or inaccessible is completed.

Install pipes, fittings and accessories in accordance with BS EN 12056.

Obtain all components for each type of pipework from the same manufacturer unless specified otherwise.

Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.

Do not bend plastics pipes.

Adequately protect pipework from damage and distortion during construction.

Fit purpose made temporary caps to prevent ingress of debris.

Fit all access covers, cleaning eyes and blanking plates as the work proceeds.

Where not specified otherwise, use plated, sheradised, galvanized or non-ferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

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#### **4.5.4 CO-ORDINATION WITH FINISHES**

Ensure any access doors and rodding eyes etc. are positioned so that access panels can be sympathetically accommodated within building finishes i.e. tiled removable panels/secret fixed access doors etc.

Ensure other trade contractors are aware of access panel locations to ensure panels are not concealed behind finishes.

#### **4.5.5 PIPE ROUTES**

Install pipes to the shortest practical route, with as few bends as possible and no bends in wet portion of soil stacks, unless agreed with Engineer. Agree pipe routes not adequately shown on drawings with the Services Engineer before commencing work.

#### **4.5.6 FIXING PIPEWORK**

Fix wastes securely at specified centres plumb and/or true to line.

Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.

Fix externally socketed pipes/fittings with sockets facing upstream.

Provide additional supports as necessary to support junctions and changes in direction.

Fix every length of pipe at or close below the socket collar or coupling.

Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that all pipework is self supporting and undue weight is not imposed on fixings at the base of the pipe.

Isolate from structure where passing through walls or floors and sleeve pipes using sleeves one size larger than pipe.

Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.

Fix expansion joint pipe sockets rigidly to the building; elsewhere use fixings that allow the pipe to slide.

#### **4.5.7 FIRE STOPPING**

Provide intumescent collars or suitably rated seals, correctly sized and appropriately rated for the location chosen, to all pipes penetrating fire barriers.

#### **4.5.8 TERMINATIONS**

Ensure all vent pipes from stacks terminate above the roof of the buildings, well away from any openings into the building.

Provide terminations with soaker sheet, sealing system, weathering cravat and bird cowl etc. to interface directly with the building's roofing system.

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#### **4.5.9 ACCESS FOR TESTING AND MAINTENANCE**

Install pipework with adequate clearance to permit testing, cleaning and maintenance.

Position access fittings and rodding eyes so that they are not obstructed by other pipework, framing, etc.

#### **4.5.10 TESTING GENERALLY**

Inform Engineer sufficiently in advance to give him a reasonable opportunity to observe tests.

Check that all sections of installation are securely fixed and free from obstruction and debris.

Ensure that all traps are filled with clean water.

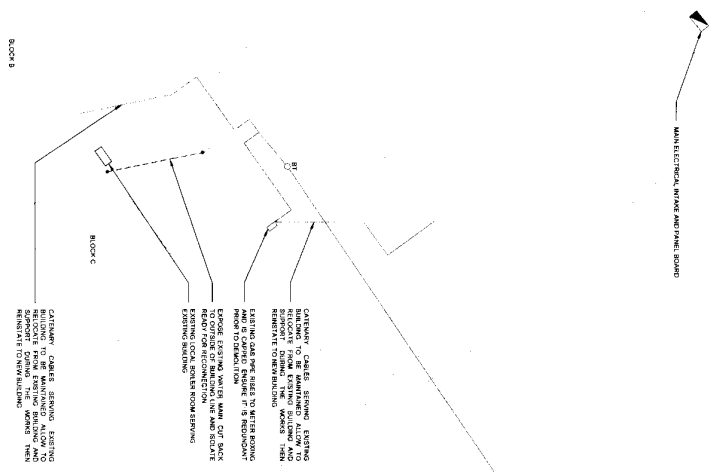
Carry out tests as specified in section 2. After testing, locate and remedy all defects without delay and retest as instructed. Do not use smoke to trace leaks.

Keep a record of all tests and provide a copy of each to Engineer.

Ensure all tests are witnessed, either by the Engineer or Building Control Officer.

Ensure that temporary caps have been removed and that permanent blanking caps, access covers, rodding eyes, floor gratings and the like are secured complete with all fixings.

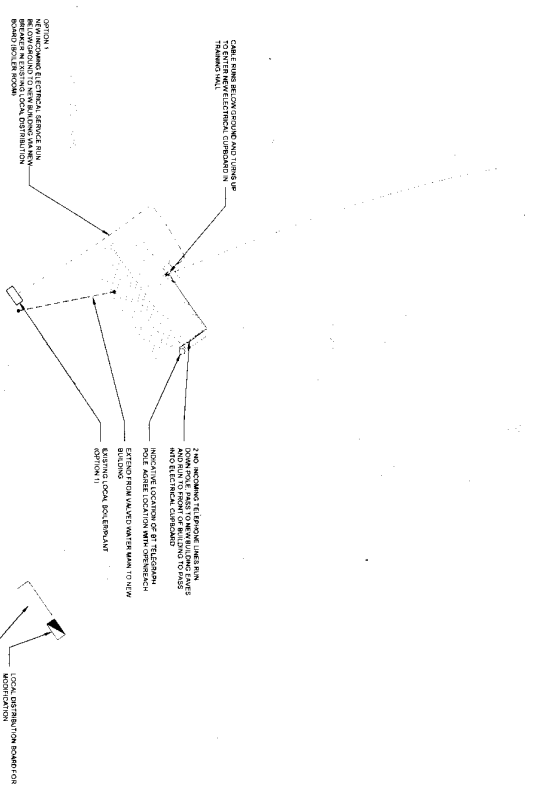
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ATTENTION: CABLE SERVICES EXISTING BUILDING TO BE MAINTAINED ALONG TO ROOF 4 AND ROOF 5. ALL CABLE SERVICES TO BE REMOVED FROM THIS BUILDING. WORKS TO BE COMPLETED BEFORE DEMOLITION OF THIS BUILDING.

<b>POPE</b> Building Services Consulting Engineers 1 West Park, Cranleigh, West Sussex PO18 1TL Tel: 01243 820000 Email: <a href="mailto:info@popeng.co.uk">info@popeng.co.uk</a> <small>Registered in England No. 10478976. Limited by Guarantee. Registered Office: 1 West Park, Cranleigh, West Sussex PO18 1TL.</small>			
<b>CONTRACT</b>			
NO.	DESCRIPTION	DATE	BY
1	CONTRACT ISSUE	15/01/14	ME001
2	REVISION		
<b>CLIENT</b> sarchitecture			
<b>PROJECT</b> JOINT AT/CAF CANTERBURY			
<b>DRAWING TITLE</b> EXISTING SITE PLAN DEMOLITION WORKS			
DATE	STATUS	CREATED BY	CHECKED BY
01/08/14	ISSUED FOR TENDERS	ME001	CI
PROJECT NO: 2907			
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MAIN ELECTRICAL INTAKE AND SWITCH  
PANEL LOCATION IS  
INDICATED BY  
REWORK IN EXISTING MAIN PANEL ROOM



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**SCArchitecture**

PROJECT: **JOINT ATC / ACE  
CANTERBURY**

DRAWING TITLE: **PROPOSED SITE PLAN**

DATE	DESCRIPTION	SCALE
29/12/14	ISSUED FOR PERMIT	AS SHOWN

PROJECT NO: **2907** DRAWING NO: **ME002** REV: **C1**

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D

DATA CABINET WITH 14 BAY RACKS

PROPOSED OFFICE BUILDING  
SCALE: 1:20 @ A1

D

DATA CABINET WITH 14 BAY RACKS

DATA CABINET TO STORE PATCH PANELS  
NEW RACKS BY SERVICE DISTRIBUTION  
FROM ALL TO OFFICE PATCH PANELS  
AHEAD OF RACKS

REMAIN IN EXISTING WET DRY AND  
DRY RATED ENCLOSURE WITH CHANGE  
OVER TO NEW ELECTRICAL CABLE  
REWORKING

**CONTRACT**

NO.	DESCRIPTION	DATE	BY
C1	CONTRACT ISSUE	01/06/14	MS
	REVISION		

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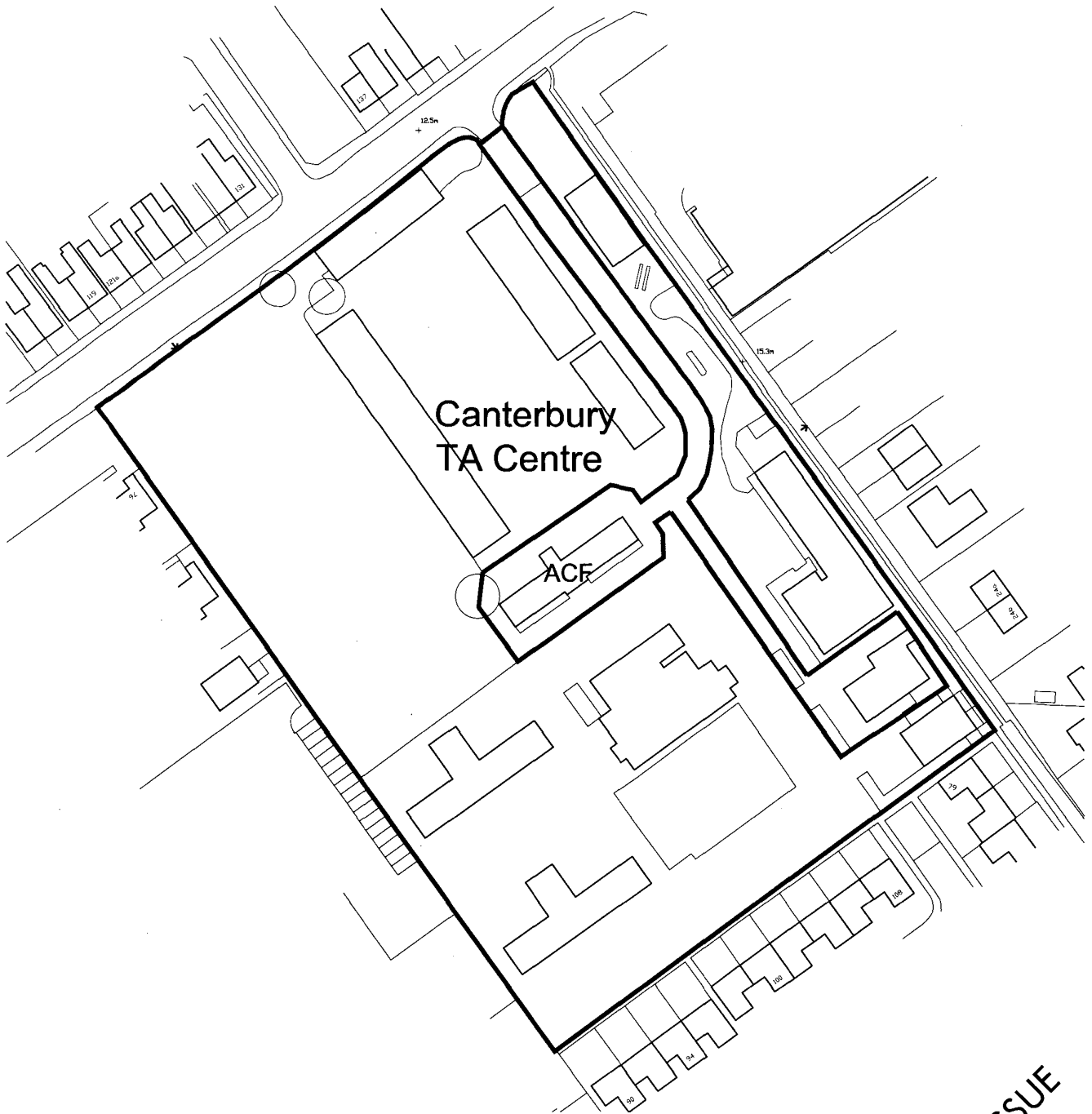
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CANTERBURY

**PROPOSED INTERNAL LAYOUT**

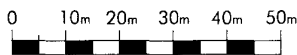
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2907	ME003	C1



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Location Plan  
AS EXISTING  
Scale 1:1250



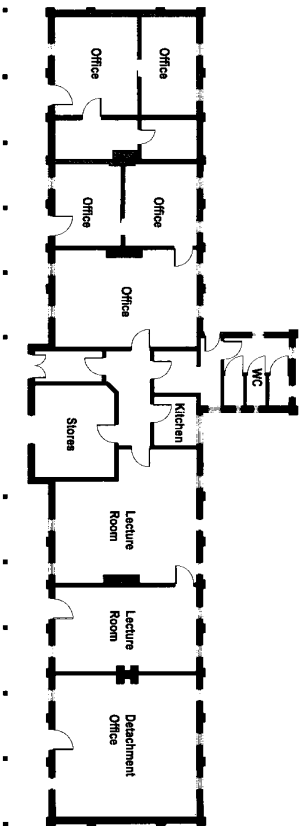
CONTRACT ISSUE

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			Canterbury - Leros Barracks	AS EXISTING	Scale: 1:1250
			SERFCA		Drawn: RSS
					Checked: MS
 Anchor House, School Lane Chandlers Ford, Eastleigh Hampshire SO53 4DY			T: 023 8026 9222 E: info@sc-architecture.co.uk W: www.sc-architecture.co.uk		Drawing Number: <b>3644.00</b> Revision:
					

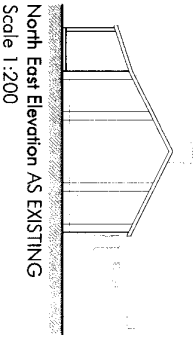
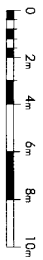
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Original Drawing Size: A4

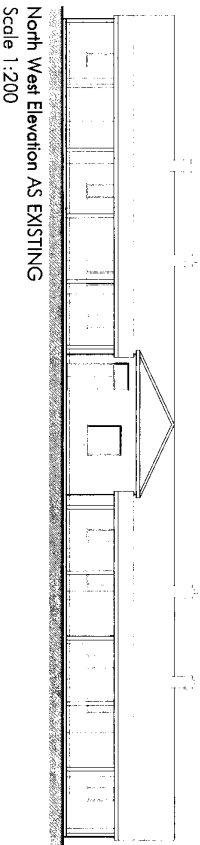




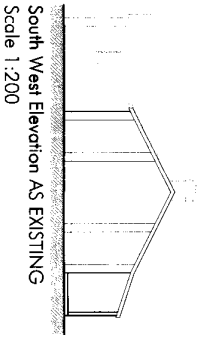
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AS EXISTING  
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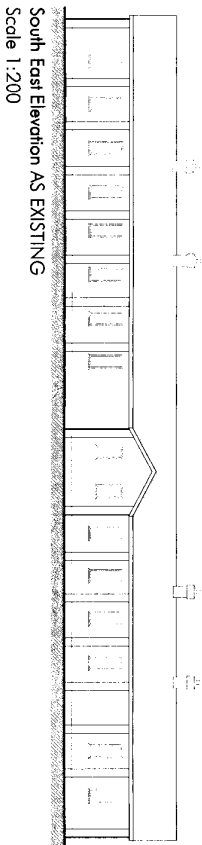
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Scale 1:200



North West Elevation AS EXISTING  
Scale 1:200



South West Elevation AS EXISTING  
Scale 1:200



South East Elevation AS EXISTING  
Scale 1:200

No.	Description	Date

**SC Architecture**  
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Project Title:  
AOH ATC  
Canterbury -  
Leros Barracks  
SERFOA

Drawing Title:  
Floor Plans &  
Elevations  
AS EXISTING

Drawing No.:  
3644. 102

Revision:  
Date: Mar '13  
Scale: 1:200  
Drawn: RSS  
Checked: MS

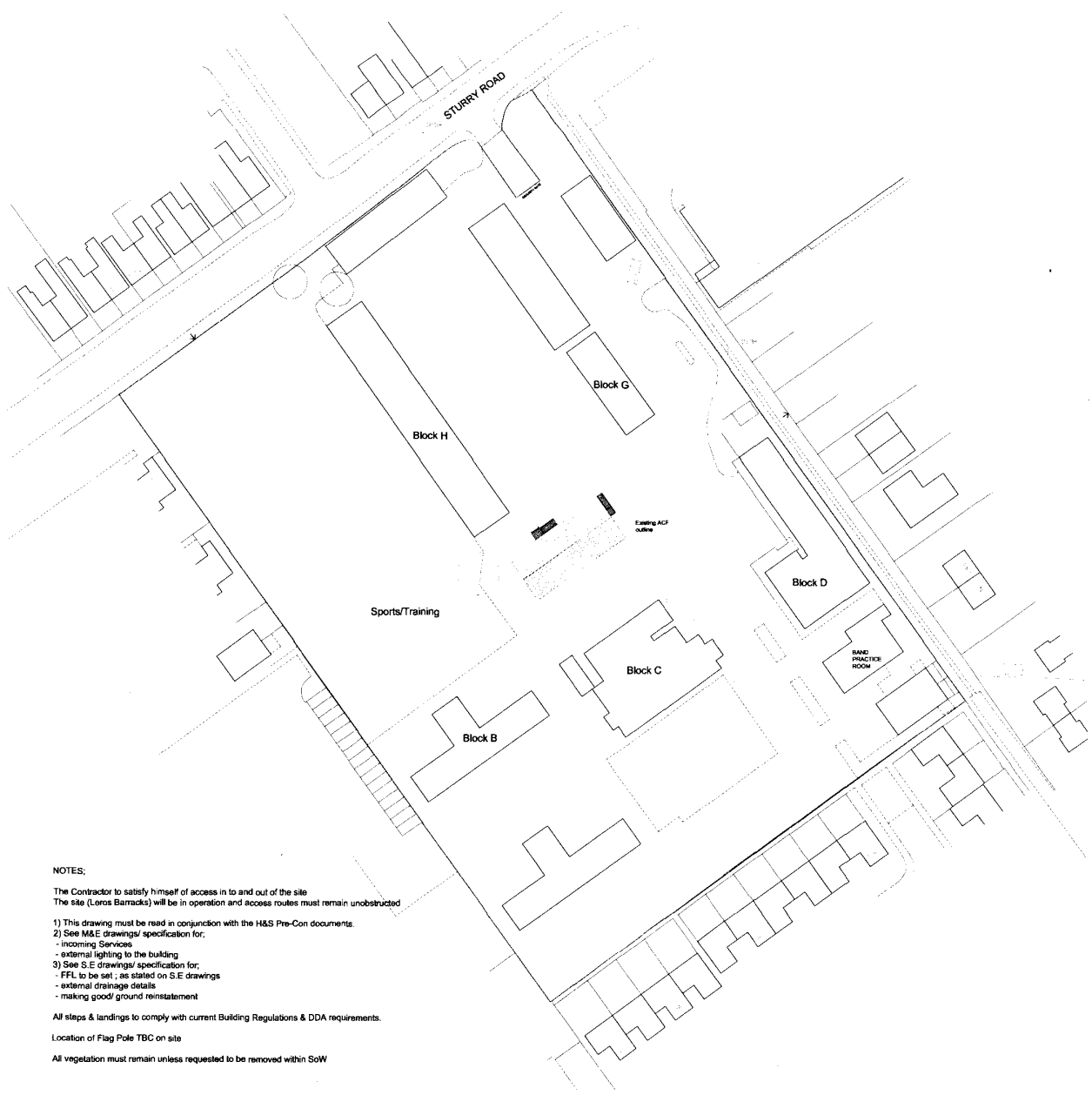
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Rev No	Rev Description	Rev Date
<b>SC Architecture</b> Architects, Planners, Engineers 105-107, Victoria Road, Brighton, Victoria 3186 Tel: 03 9594 1000 Fax: 03 9594 1001 www.scarchitecture.com.au		
Project Name <b>ACF/ATC          Canterbury - Leross Barracks          SERFCA</b>		
Drawing Title <b>Site Plan          AS PROPOSED</b>		
Date	Rev No	Drawing No
18/04/14	1	3644.103
Scale	1:200	
Discipline	MES	
Author	RS	

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**NOTES:**

The Contractor to satisfy himself of access in to and out of the site  
 The site (Leross Barracks) will be in operation and access routes must remain unobstructed

- 1) This drawing must be read in conjunction with the H&S Pre-Con documents.
- 2) See M&E drawings/ specification for:
  - incoming Services
  - external lighting to the building
- 3) See S.E drawings/ specification for:
  - FFL to be set, as stated on S.E drawings
  - external drainage details
  - making good/ ground reinstatement

All steps & landings to comply with current Building Regulations & DDA requirements.

Location of Flag Pole TBC on site

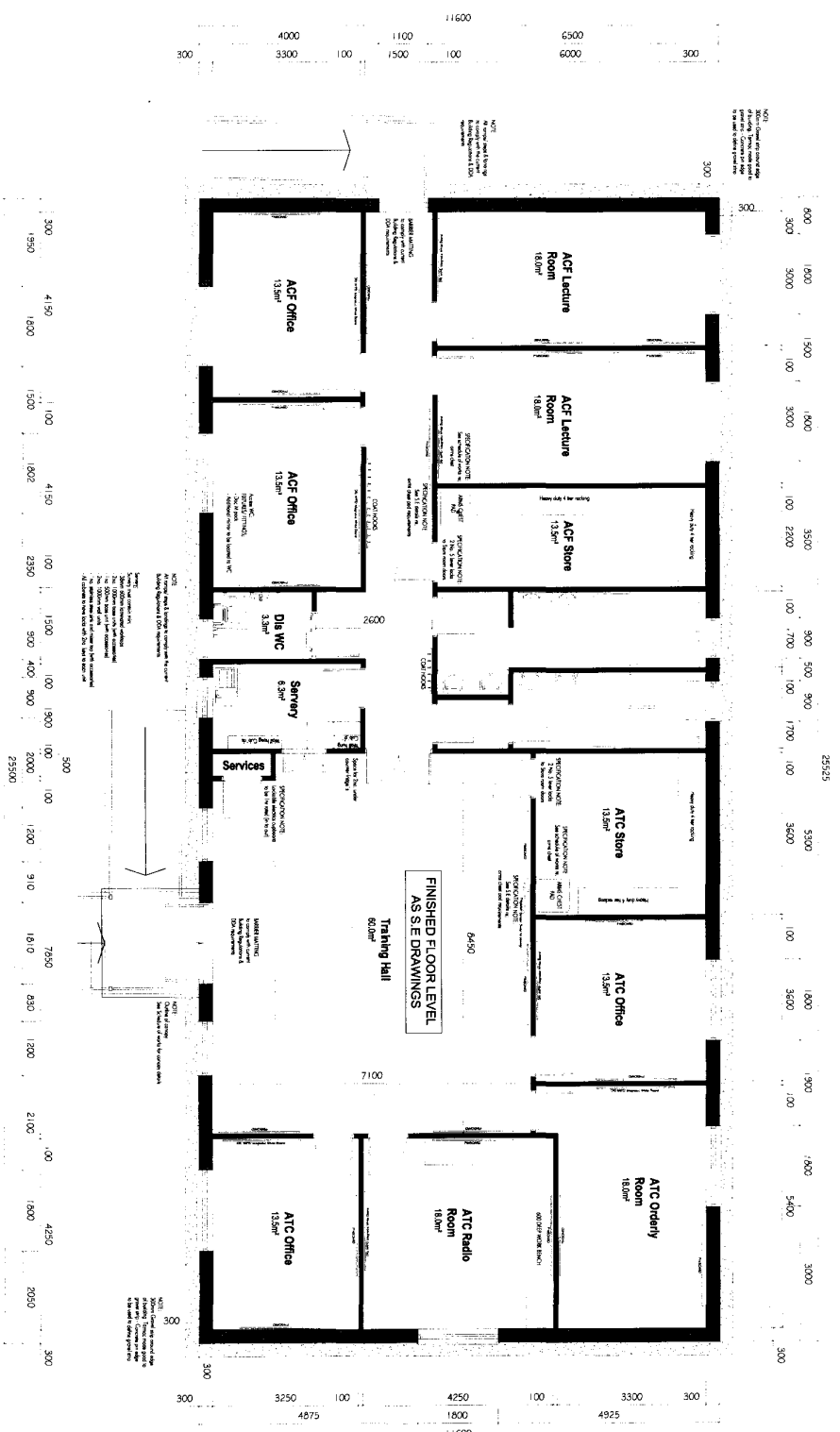
All vegetation must remain unless requested to be removed within SoW

**NOTES:**

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH:

- 1) THE SCHEDULE OF WORKS/ SPEC
- 2) M&E DRAWINGS/ SPECIFICATION
- 3) S.E DRAWINGS/ SPECIFICATION
- 4) S.E DRAWINGS/ SPECIFICATION
- 5) PRE-CONSTRUCTION INFORMATION





**NOTES:**

- 1) THE SCHEDULE OF WORKS (SOW)
- 2) MODULAR BUILDING SPECIFICATION
- 3) ASSE SPECIFICATION/DRAWINGS
- 4) PRE-CONSTRUCTION DETAILS & DRAWINGS
- 5) PRE-CONSTRUCTION HAS INFORMATION

**GENERAL:**

- Fire exit signage to be installed in accordance with BS 5499 Part 1.
- Fire extinguishers backing boards (printed RED) to be supplied and fixed, locations and number TBC
- Homogeneity to include 3no. hinges per door/ SAA tick plates to each side/ standard SAA door handle/ door closer/ FDOS signs & door stops
- The tactile sign (lay 300mm x 200mm) to external face of door reading 'TSC' to advise on use of room.
- Relief blind to all full height windows (black out blind to drill hole)

**NOTES:**

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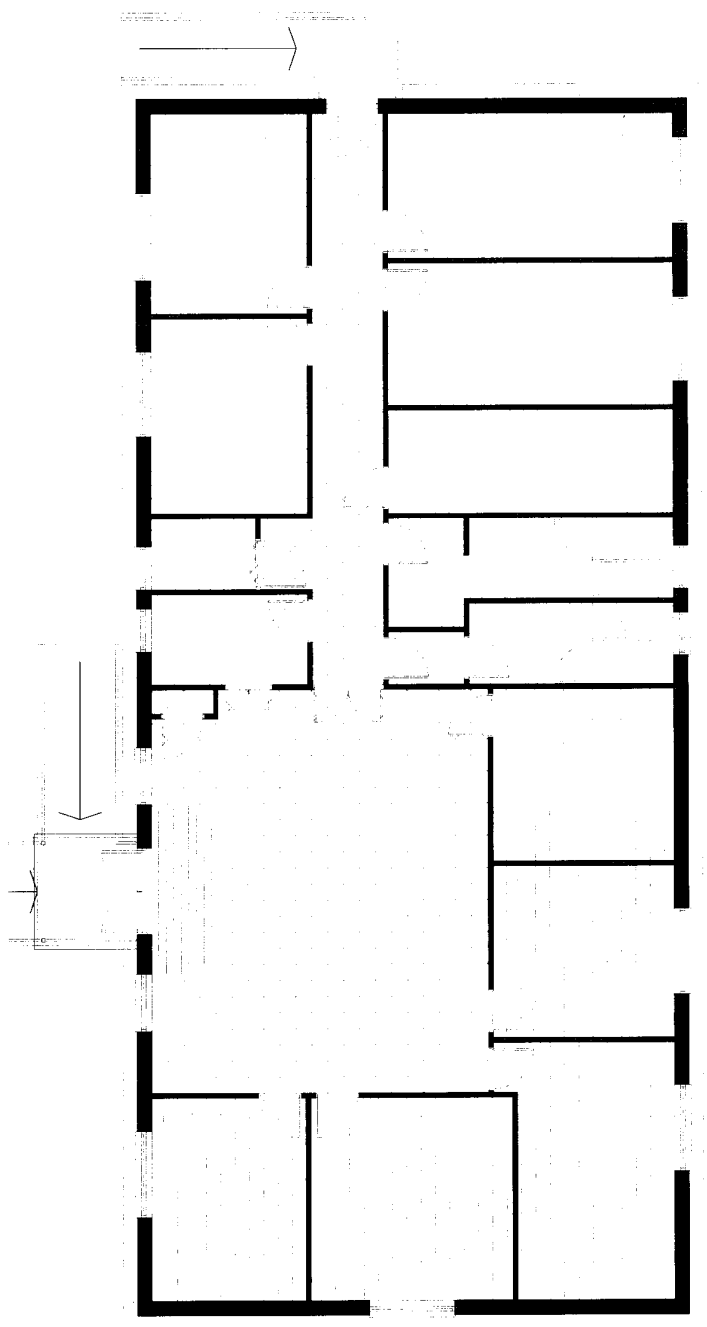
- 1) THE SCHEDULE OF WORKS (SOW)
- 2) MODULAR BUILDING SPECIFICATION
- 3) ASSE SPECIFICATION/DRAWINGS
- 4) PRE-CONSTRUCTION DETAILS & DRAWINGS
- 5) PRE-CONSTRUCTION HAS INFORMATION

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**SC Architecture**  
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Project No: 1000000000  
 Drawing No: 3644.105  
 Scale: 1:50  
 Date: 10/13/2014  
 Author: [Name]  
 Checker: [Name]  
 Approver: [Name]

**NOTES:**  
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 2) MODULAR BUILDING SPECIFICATION  
 3) M&E SPECIFICATION/ DRAWINGS  
 4) SE SPECIFICATION DETAILS & DRAWING  
 5) PRE-CONSTRUCTION HIS INFORMATION



- ATC - Thick Grade Vinyl Sheet;  
(Tolerant vinyl sheet Vinyl Plus or similar equal approved) - Colour 72C
- Communal Areas - Thick Grade Vinyl Sheet;  
(Tolerant vinyl sheet Vinyl Plus or similar equal approved) - Colour 72C
- Thick Grade Vinyl Sheet ANT SLIP  
(Tolerant Safety flooring - Silted Universal or similar equal approved) - Colour 72C
- Burner Molding;  
Hexachloride Ballistics; Hippo Range;  
Antifouling
- ACE - Thick Grade Vinyl Sheet;  
(Tolerant vinyl sheet Vinyl Plus or similar equal approved) - Colour 72C

Project No: 3644.106  
 Date: 15/08/2023  
 Scale: 1:50  
 Drawing No: 3644.106  
 Project Name: Floor Finish (Modular Building)  
 Client: M&S  
 Designer: J. J. J. J.  
 Architect: J. J. J. J.  
 Floor Finish (Modular Building)

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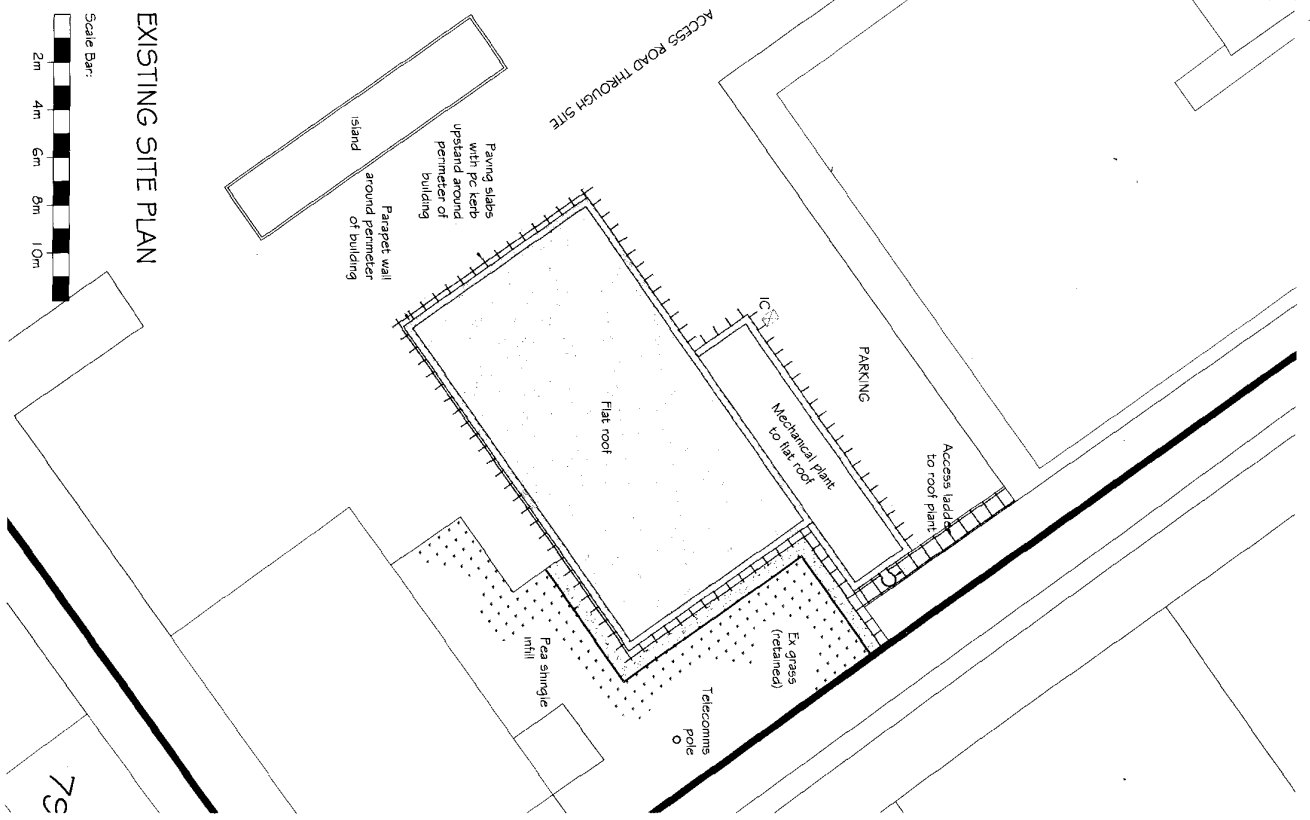
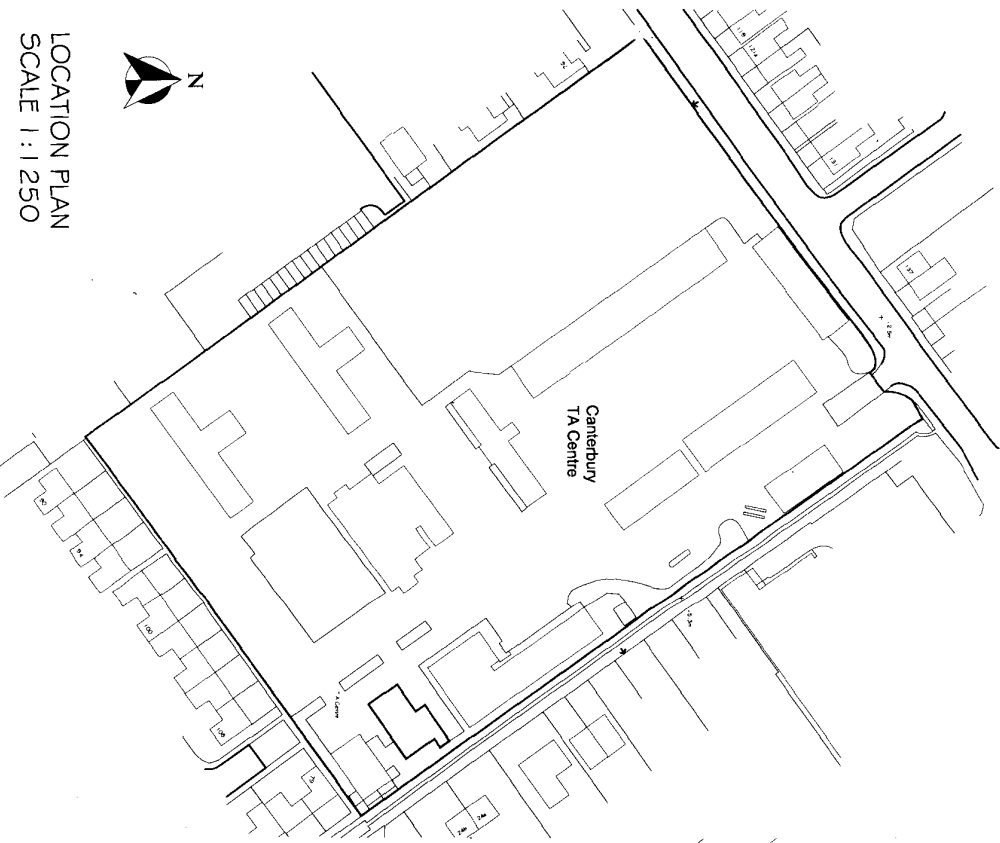
Project Title:  
 Lejos Barracks  
 Canterbury ARC  
 Slurry Road  
 Extension to Band Room

Drawing Title:  
 Existing  
 Location & Site Plan

Drawing No.:  
**3644-110**

Revision:  
 Date: April 14  
 Scale: 1:200 @ A3  
 Drawn: SDW  
 Checked: MS

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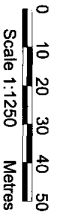


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**LOCATION PLAN**  
**SCALE 1:1250**  
 0 10 20 30 40 50  
 Scale 1:1250 Metres  
 Original Drawing Size: A3



**LOCATION PLAN**  
SCALE 1:1250

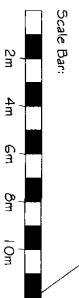
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Scale 1:1250 Metres

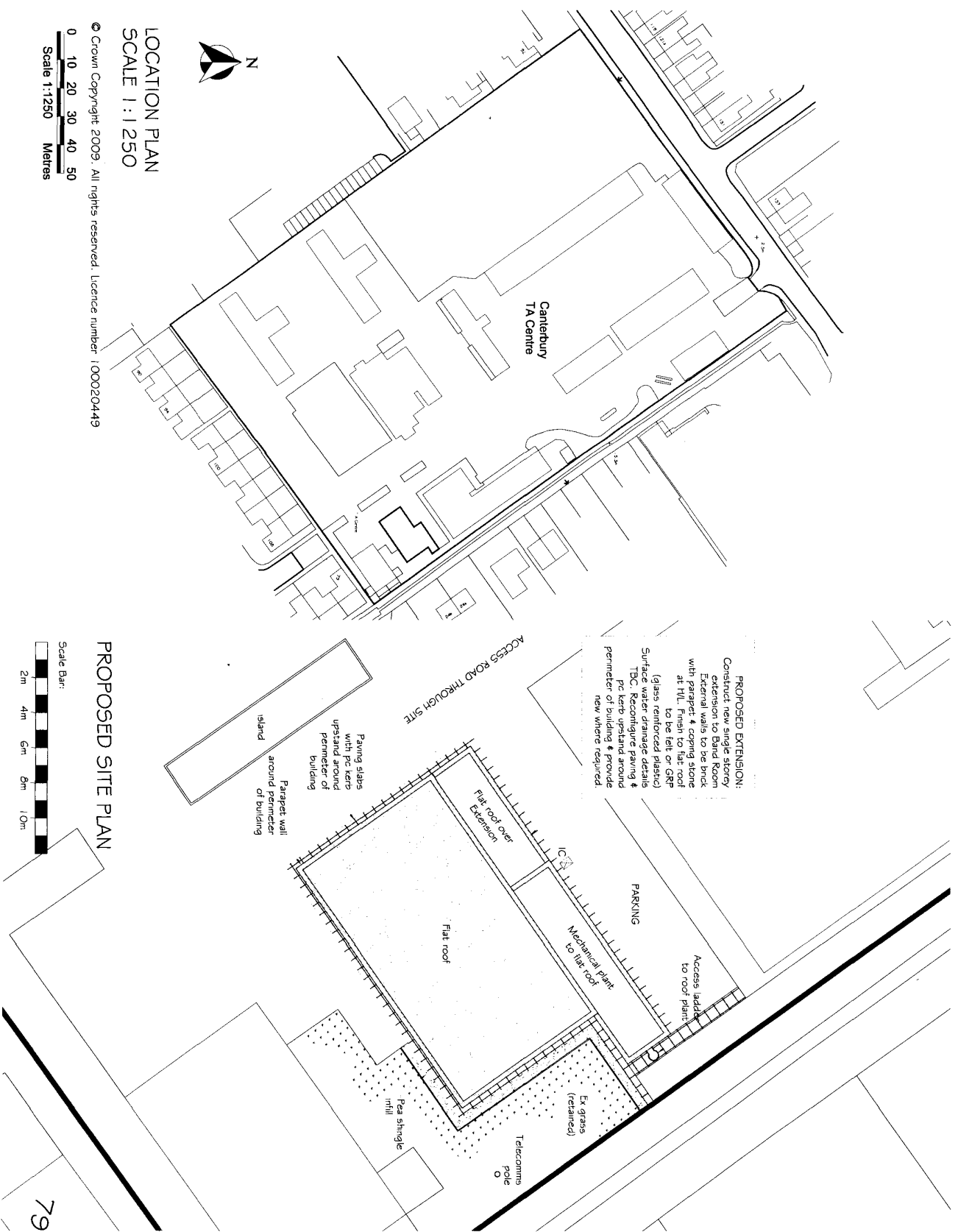
Original Drawing Size: A3

**PROPOSED SITE PLAN**



Scale Bar:

2m 4m 6m 8m 10m



**PROPOSED EXTENSION:**  
Construct new single storey extension to Band Room. External walls to be brick with parapet & coping stone at H/L. Finish to flat roof to be felt or GRP (glass reinforced plastic). Surface water drainage details TBC. Reconfigure paving & pc kerbs upstand around perimeter of building & provide new where required.

**CONTRACT ISSUE**

No.	Description	Units

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Project Title:  
Leros Barracks  
Canterbury ARC  
Slurry Road  
Extension to Band Room

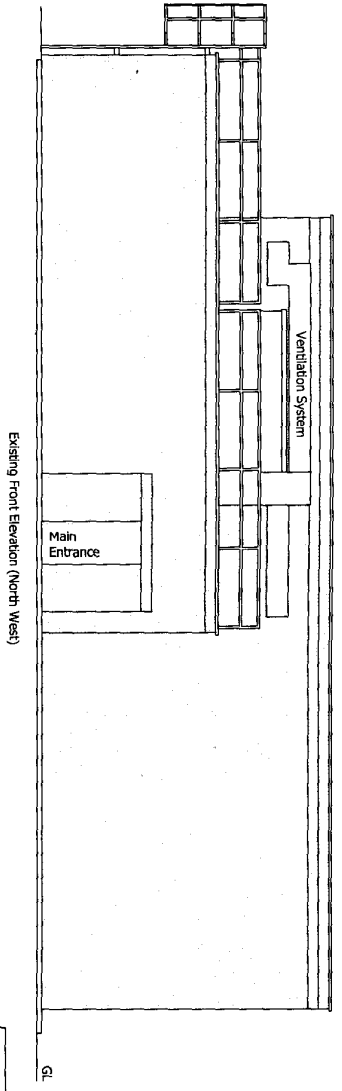
Drawing Title:  
Proposed  
Location & Site Plan

Drawing No.:  
**3644-112**

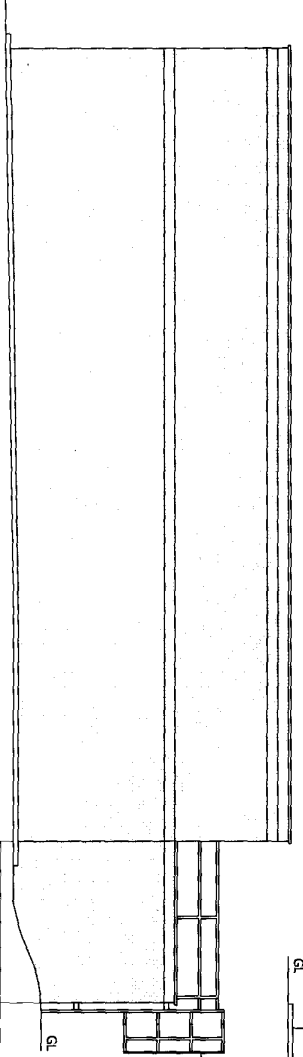
Revision:	-
Date:	April 14
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Drawn:	SDW
Checked:	MS

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79

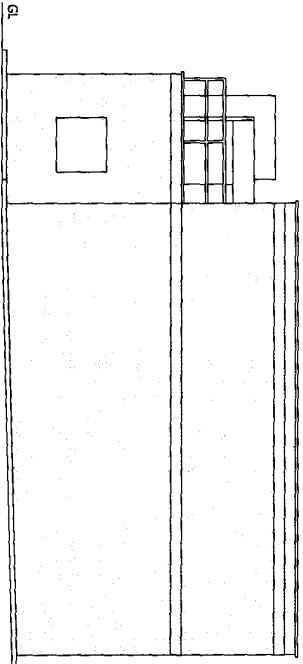


Existing Front Elevation (North West)



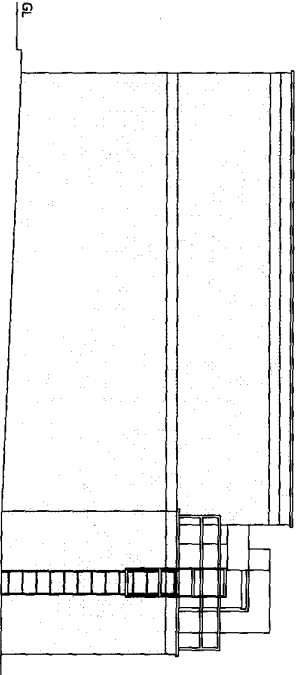
Existing Rear Elevation (South East)

Dashed line denotes ground levels beyond



Existing Side Elevation (South West)

Roof access ladder and flat roof guarding



Existing Side Elevation (North East)



Scale Bar:

Original Drawing Size: A3

No.	Description	Date

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Project Title:  
 Lejos Barracks  
 Canterbury ARC  
 Slury Road  
 Extension to Band Room

Drawing Title:  
 Existing  
 Elevations

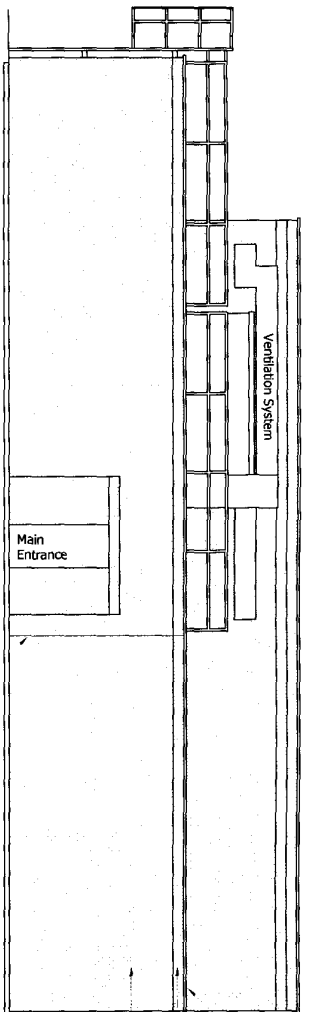
Drawing No.:  
**3644-114**

Revisions:  
 Date: April 14  
 Scale: 1:100 @ A3  
 Drawn: SDW  
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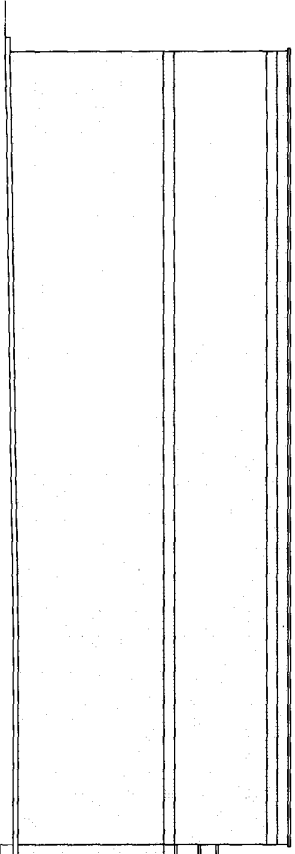


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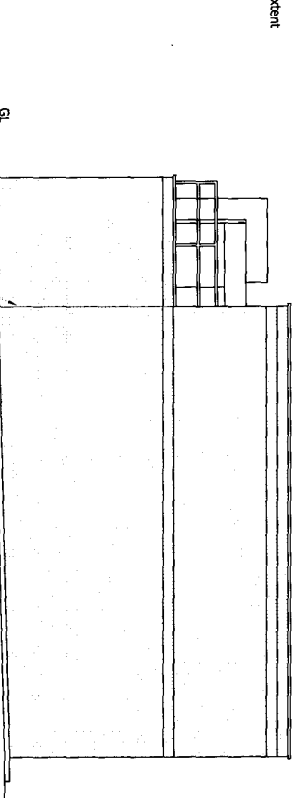


Proposed Front Elevation (North West)  
Dashed line denotes extent of existing structure

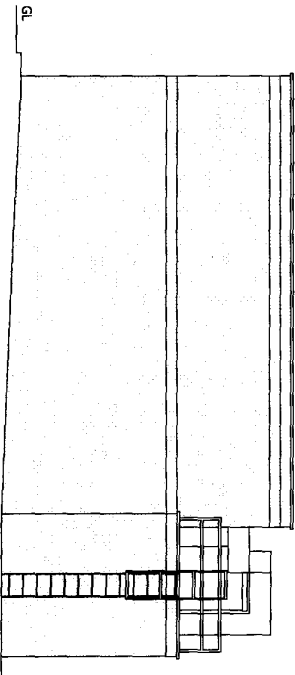
Coping detail to match existing  
Soldier course brickwork detail to match existing adjacent  
Facing brickwork to match existing



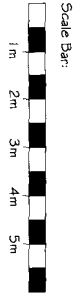
Proposed Rear Elevation (South East)  
NO CHANGE  
Dashed line denotes ground levels beyond



Proposed Side Elevation (South West)  
Dashed line denotes extent of existing structure  
Roof access ladder and hat roof guarding



Proposed Side Elevation (North East)  
NO CHANGE



Original Drawing Size: A3

No.	Description	Date

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Project Title:  
Laros Barracks  
Canterbury ARC  
Slurry Road  
Extension to Band Room

Drawing Title:  
Proposed Elevations

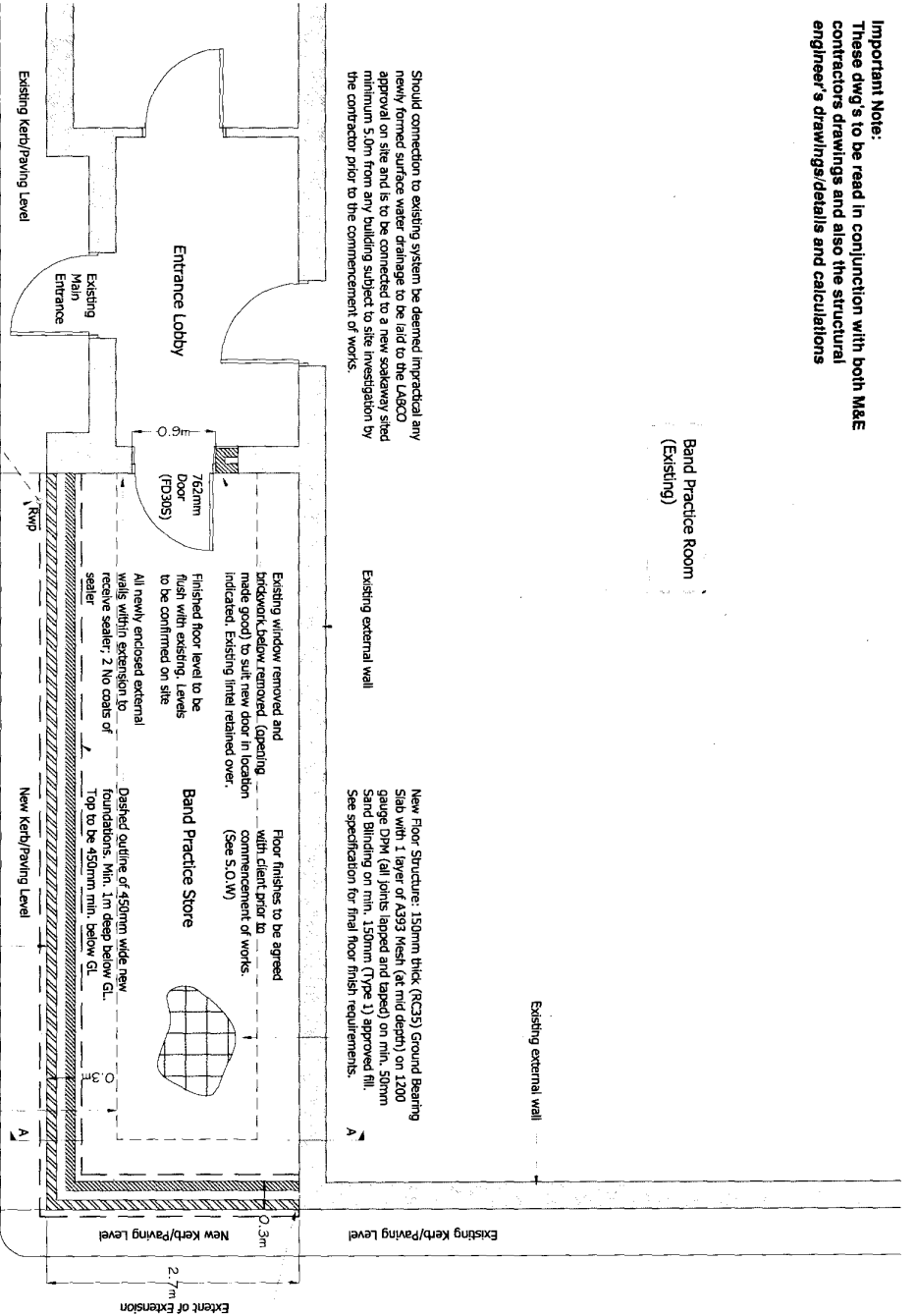
Drawing No.:  
**3644-115**

Revision:	Date:	Drawn:	Checked:
	April '14	SDW	MS

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**Important Note:**  
 These drawings to be read in conjunction with both M&E contractors drawings and also the structural engineer's drawings/details and calculations

Band Practice Room  
 (Existing)



Centrally loaded trench foundations to the approval of the LABCO on site.  
 Note:  
 Adjust level of foundations to suit ground levels and conditions if required.

New RVP to be provided with routing access pane (if required - see Roof Plan) and drainage connected to existing system

Tarmac Road Surface

Proposed Ground Floor Plan - Band Storeroom (Scale 1:50)

Original Drawing Size: A3

**Tarmac Road Surface**

Heating cabling/pipeline and electrical wiring and any other applicable services to be extended from main building into new storeroom.

**Note - where new cavity wall abuts existing wall either:**

- 1) install new vertical damper insulated gpc dressed into saw cut to existing wall; or
- 2) expose and join existing and new wall construction for continuation of cavity

10mm movement joint between new wall and existing to be filled with fostrac expand foam compressible filler and pointed with fungicidal silicone mastic to match brick colour.

New wall to be tied to existing external walls using ancon staple universal wall starter system installed in accordance with manufacturers written instructions.

**NOTE:**

Tarmac, concrete, soil and any other materials cleared as part of the new works to be removed from site

Existing Tarmac (raise good locally to meet new construction)

**CONTRACT ISSUE**

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Project Title:  
 Lagos Barracks  
 Canterbury ARC  
 Slurry Road  
 Extension to Band Room

Drawing Title:  
 Proposed Floor Plan

Drawing No.:  
 3644-116

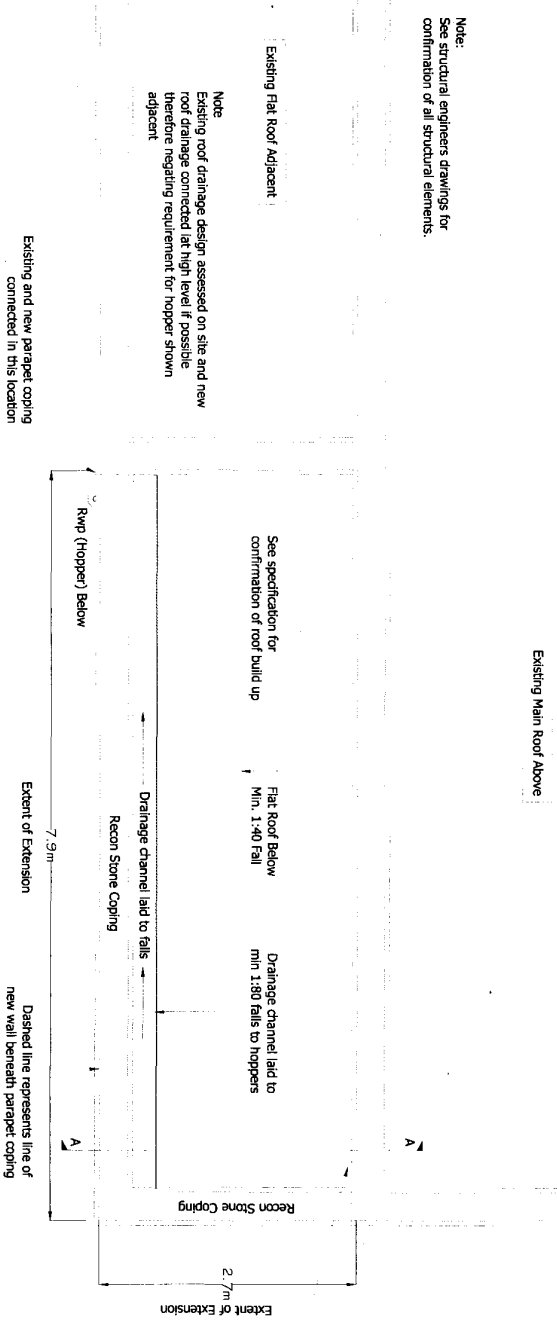
Revision:	
Date:	April 14
Scale:	1:50 @ A3
Drawn:	SDW
Checked:	MS

**No work is to be commenced until site dimensions have been checked & discrepancies reported**

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**Important Note:**  
 These drawings to be read in conjunction with both M&E contractors drawings and also the structural engineer's drawings/details and calculations

**Note:**  
 See structural engineers drawings for confirmation of all structural elements.



**Note:**  
 Existing roof drainage design assessed on site and new roof drainage connected at high level if possible therefore meeting requirement for hoppers shown adjacent

Existing and new parapet coping connected in this location

Contractor to expose existing structure to determine requirement for cavity tray at new abutment from flat roof. Cavity tray added in all location where practicable. Provide min. 150mm lead flashing to all perimeter upstands. Remove tile hanging and redress as necessary

Proposed Roof Plan - Band Storeroom (Scale 1:50)

Original Drawing Size: A3

**No work is to be commenced until site dimensions have been checked & discrepancies reported**

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**Project Title:**  
 Leroy Barracks  
 Canterbury ARC  
 Slurry Road  
 Extension to Band Room

**Drawing Title:**  
 Proposed Roof Plan

**Drawing No.:**  
 3644-117

**Revision:**  
 Date: April 14  
 Scale: 1:50 @ A3  
 Drawn: SDW  
 Checked: MS

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**Important Note:**  
 These dwgs to be read in conjunction with both M&E contractors drawings and also the structural engineer's drawings/details and calculations.  
 No work is to be commenced until site dimensions have been checked & discrepancies reported

See S.E. drawings and details for confirmation of all structural elements  
 All flashings, valleys, dips and soakers to the Lead Development Associations details

Existing parapet wall with roof adjacent  
 Cavity tray to be installed wherever new roof structure abuts existing wall (if applicable)  
 Min. 150mm Lead upstand to wall

Existing handrail guarding (beyond)

Warm roof construction (aid to falls)

Drainage channel laid to min 1:80 falls to hoppers

400mm wide reconst stone / concrete coping

Soldier course brickwork detail to match existing adjacent

Cavity wall construction

Flat roof joists to be 45x145 C16s @ 400 Ctrs with min. 25mm S.W. timber furring (producing roof fall min 1:40) with 18mm Ply mechanically fixed to top. Ceilings to receive plasterboard and skim finish and painted as necessary

Facing brickwork to match existing

DPC to be min. 2 no. brick courses (150mm) above GL

New kerbstone/paving to line through with existing adjacent

Existing Tarmac (Made good locally to meet new construction)

Lean mix concrete cavity fill to be min. 225mm from nearest DPC

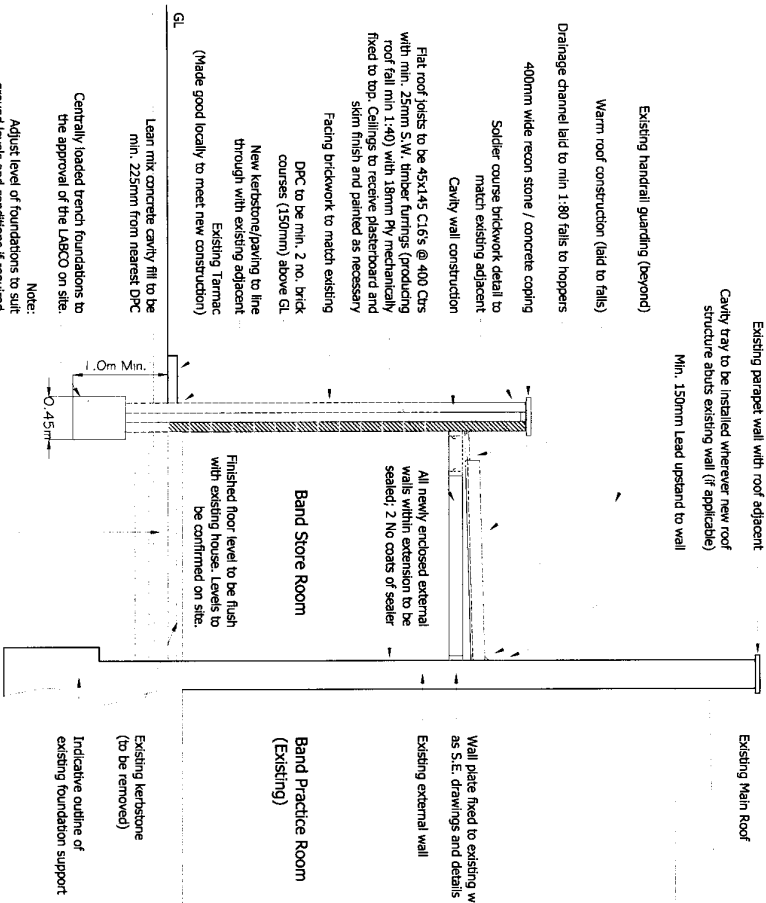
Centrally loaded trench foundations to the approval of the LABCO on site.

Note:  
 Adjust level of foundations to suit ground levels and conditions if required.

New Floor Structure: 150mm thick (RC33) Ground Bearing Slab with 1 Layer of A393 Mesh (at mid depth) on 1200 gauge DPM (all joints lapped and taped) on min. 50mm Sand Blinding on min. 150mm (Type 1) approved fill. See specification for final floor finish requirements.

Proposed Section AA - Band Storeroom (Scale 1:50)

Note: See S.E.s drawings & details for further information



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Project Title:  
 Lerros Barracks  
 Canterbury/ARC  
 Sturry Road  
 Extension to Band Room

Drawing Title:  
 Proposed Section AA

Drawing No.:  
 3644-118

Revision:  
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**Building Notes:**  
 All dims and details shown on the project drawing are to be checked on site by the contractor before fabrication and erection.  
 Figured dimensions to supersede scaled dimensions.  
 All building work to be carried out with proper materials which are appropriate for the circumstances in which they are used, in a workmanlike manner and in accordance with the relevant building regulations, British standards, nbc standards and manufacturers recommendations.

**Site Clearance & Ground Preparation:**  
 Demolish and remove existing kerbstone, paving and barrier ground surface and ground support within new extension footprint.  
 Excavate trenches for foundations where applicable (see drawing 3644-116 for confirmation of locations).

**Foundations**  
 Foundations shall comply with BS 8004: 1986 and be placed centrally below supported walls, unless noted otherwise.  
 Generally trench fill concrete. Grade GEN 3 to BS EN 206-1 and BS 8500-1 & 2: 2002. Minimum width of 450mm. Lead bearing walls: Minimum depth of 1000mm below finished ground level all in accordance with the structural engineers details.

Final size of foundation to suit ground conditions and to the approval of Building Control Officer at site inspections. Where ground levels necessitate stepped foundations, each step shall not exceed the foundation, thickness and shall overlap by at least the foundation thickness or twice the height of step whichever is the greater.

**Ground Floor**  
 The floor shall be of ground bearing construction comprising 150mm minimum thick in situ concrete slab Grade GEN 3, and to BS 8500 and BS EN 206-1 with A393 mesh at mid point, on 1200 gauge DPM (all joints taped and lapped) bedded on 50mm sand blinding on 150mm well consolidated hardcore all to the approval of the local building control officer on site. Ground below to be stripped of vegetable soil and thoroughly treated with weed killer.

150mm overall thickness floor finish to be 65mm thick sand cement screed C/W mesh re-inforcement, laid on continuous VCL (vapour control layer) over 85mm thick Celotex FRS-K FFI-000 insulation board, C/W 20mm thick Celotex 1-Break TB3000 upstairs at all perimeters, on a continuous 1200 gauge polythene vapour check / DPM.

**NOTE:** both the VCL and DPM are to be lapped (by a min of 150mm) and taped at all joints, seams and junctions. The perimeter of the DPM is to be lapped onto adjacent DPM's unless otherwise noted. The perimeter of the VCL is to be exposed and subsequently cut back, and be left visible, the edge will ultimately be under the slirting.

**External walls and finishes**

Generally 300mm overall width cavity construction comprising either 102.5mm facing brickwork, 97.5mm cavity, filled with 477mm Celotex CG5000 cavity insulation board or similar approved system (to achieve a U-value of 0.28W/m<sup>2</sup>k) allowing minimum 50mm clear cavity, and 100 Durox Squabloc, minimum thermal conductivity of 0.11W/mk, (or equal) insulating block inner leaf to BS 6073-2: 1981 (min 3.5 or 7N/mm<sup>2</sup> or as specified on drawings) above dpc level, brick inner leaf below dpc. Check brick and block manufacturer's recommendations regarding appropriate mortar mixes and provision of expansion joints.

Below ground wall construction consists of 103 facing brickwork (min 5.0N/mm<sup>2</sup>), 97mm cavity, no fill required, and 100mm concrete blockwork (7.3N/mm<sup>2</sup>) laid flat in 1:1.6 mortar.

Non ferrous stainless steel cavity wall ties, 225mm long, to BS EN 845-1: 2003, provided at 750mm horizontal and 450mm vertical centres, staggered in alternate rows to BS 5628-3: 2005. Additional ties positioned within 150mm of opening jambs at 300mm max vertical centres. Cavities to be infilled with lean mix concrete to within 150mm of dpc. Internal wall finish of 12.5mm thick plasterboard on dabs unless noted otherwise.

Polythene dpc to BS 6515: 1984 on mortar bed positioned horizontally 150mm minimum above ground/paving level. DPCs to be continuous with 150mm lap minimum at joints. DPCs to all opening jambs to be insulating type, to comply with current Building Regulations, to prevent cold bridging, installed in accordance with manufacturers instructions.  
 All external materials within 1000mm of the boundary are to be Class 0 Rated.

**Flat Roof (Warm Roof Construction):** To achieve 0.18W/m<sup>2</sup>K  
 Flat roof of 3 layer built up felt to BS747, CP144 with all layers hot bonded. Surface finish of mineral chippings bedded in hot bitumen. Alternatively use Sarnafil single ply membrane fully adhered to prepared substrate roof covering or similar approved.

Use 126mm Celotex TD4000 decking/insulation with high performance vapour control layer to CP144 to provide warm roof construction and minimum U-value of 0.18W/m<sup>2</sup>K. All on firing pieces to falls of 1 in 40 on min. 18mm ply. As S.E. detail on structurally supporting flat roof timber joists as specified by S.E., supported by appropriately sized joist hangers into new wall and hung from new wallplate on existing building. Lined internally with 12.5mm foil backed plasterboard ceiling. Ceiling lining to finish flush with adjacent ceiling zones.

See S.E. drawings and details for confirmation of all structural elements

Lateral restraint at ceiling joist level provided by 30x50mm galvanised mildsteel straps at 1800mm max. centres across 2 No. joists. Fix noggins between joist, below straps and peak between last joist and wall.

Where roof abuts any wall provide code 4 lead flashing with 150mm min upstand connected to proprietary horizontal and stepped cavity tray dpc's within external wall as appropriate.

Heat gains and losses through the building fabric are to be limited, with continuity of insulation to the building envelope as extensive as practicable and limitation of air permeability as complete as practicable.

**Ventilation**  
 Existing ventilation system extended into new store room to the satisfaction of the client. Design to be agreed prior to commencement of works.

**Electrical Works:**  
 All new electrical work is to be designed, installed, inspected and tested in accordance with BS 7671 (I.E.E. Wiring Regulations 16th Edition). The works are to be undertaken by NICEIC approved contractor with a certificate of compliance produced and issued to Building Control on completion of the works.

**General**  
 All work to conform with the latest edition of the Building Regulations and to the Health Acts of 1936 and 1961. Main contractor to inspect all materials and verify all dimensions. Any discrepancy or changes to approved design must be discussed before commencement of work.

**Decoration:**  
 Painting and decoration to architect's specification. See Schedule of Works document.

Thoroughly prepare and fill all surfaces using approved filler and apply knotting to all new woodwork as required. Paint application as follows; 1x coat pink primer, 2x coat undercoat and 1x coat gloss to all new mouldings. Note: allow for inspection by Contract Administrator prior to application of second undercoat. Apply 1x mist coat and 2x coats of water based eggshell to new plastered walls and making good where necessary.

**General:** Crown trade paints to be used with BS clearly marked.

CONTRACT ISSUE

No.	Description	Date

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Project Title:  
 Leros Barracks  
 Canterbury ARC  
 Slurry Road  
 Extension to Band Room

Drawing Title:  
 B. Regs/Specification

Drawing No.:  
 3644-119

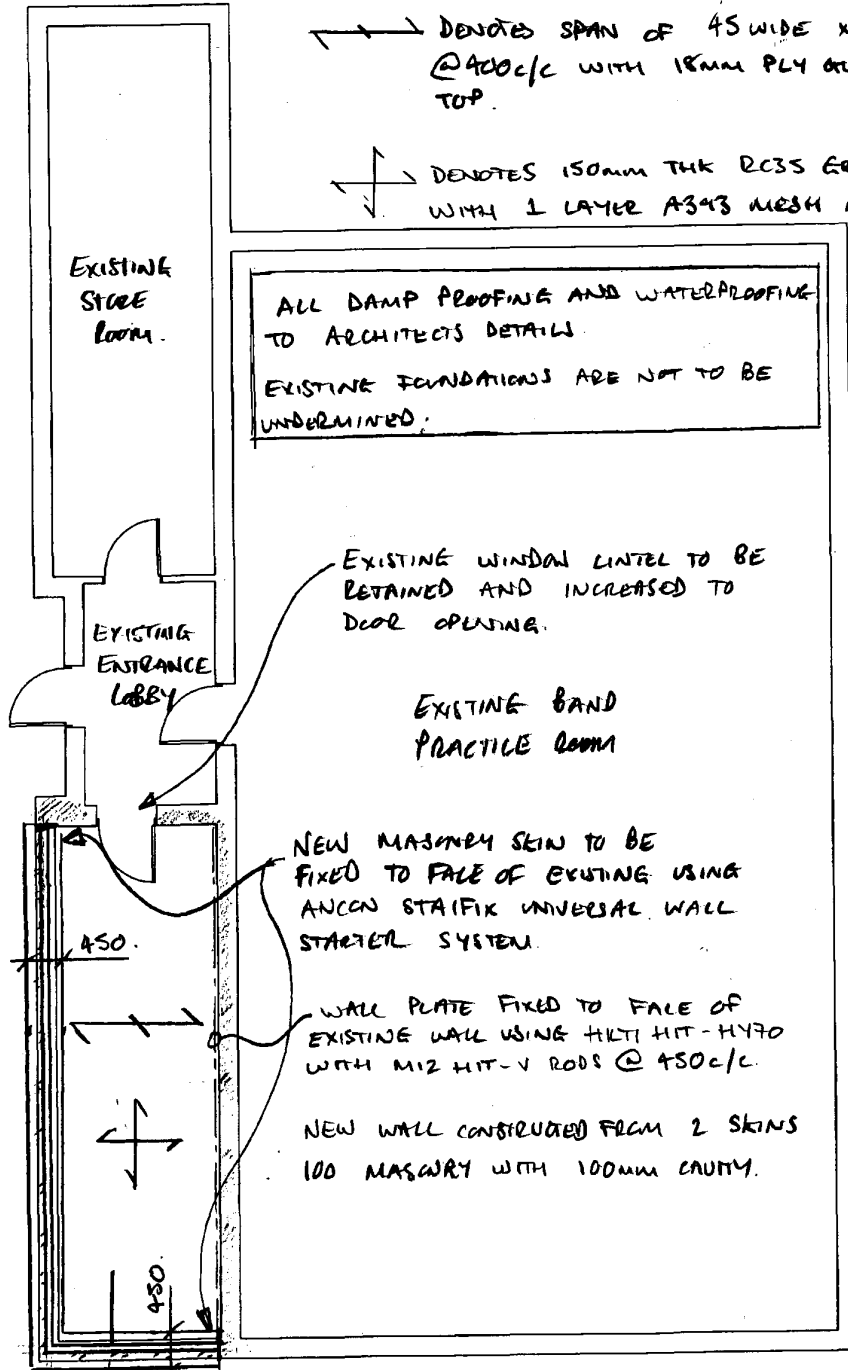
Revision:	Date:	Scale:	Drawn:	Checked:
	April 14	1:50 @ A3	SDW	MS

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PROJECT: EXTENSION TO EXISTING BAND PRACTICE BUILDING.



↔ DENOTES SPAN OF 45 WIDE x 145dp CIB JOISTS @ 400c/c WITH 18mm PLY DECK AND SCREWED TO TOP.

↕ DENOTES 150mm THK RCCS GRAND BEARING SLAB WITH 1 LAYER A343 MESH AT MID DEPTH.

ALL DAMP PROOFING AND WATERPROOFING TO ARCHITECTS DETAILS.

EXISTING FOUNDATIONS ARE NOT TO BE UNDERMINED.

EXISTING WINDOW LINTEL TO BE RETAINED AND INCREASED TO DOOR OPENING.

EXISTING BAND PRACTICE ROOM

NEW MASONRY SKIN TO BE FIXED TO FACE OF EXISTING USING ANCON STAFIX UNIVERSAL WALL STARTER SYSTEM.

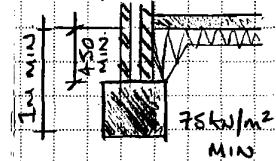
WALL PLATE FIXED TO FACE OF EXISTING WALL USING HILT HIT-HY70 WITH M12 HIT-V RODS @ 450c/c.

NEW WALL CONSTRUCTED FROM 2 SKINS 100 MASONRY WITH 100mm CAVITY.

30x5mm RESTRAINT STRAPS FIXED TO PROPOSED WALL AND TO UNDERSIDE OF PROPOSED JOISTS. DETAIL ALSO APPLIED AT OTHER END OF EXTENSION.

PROPOSED FOUNDATIONS.

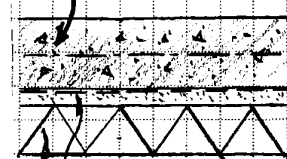
FOUNDATIONS TO BE 450mm WIDE AND 1m MIN DP BELOW GRAND LEVEL. TOP OF FOUNDATIONS TO BE 150mm MIN BELOW GRAND LEVEL. FOUNDS TO BE TAKEN INTO GRAND CAPABLE OF SUSTAINING A GRAND BEARING PRESSURE OF 75kN/m<sup>2</sup> MIN.



GRAND BEARING SLAB.

FLOOR FINISHES TO ARCH DETAILS.

150 RCCS SLAB WITH 1 LAYER A343 MESH

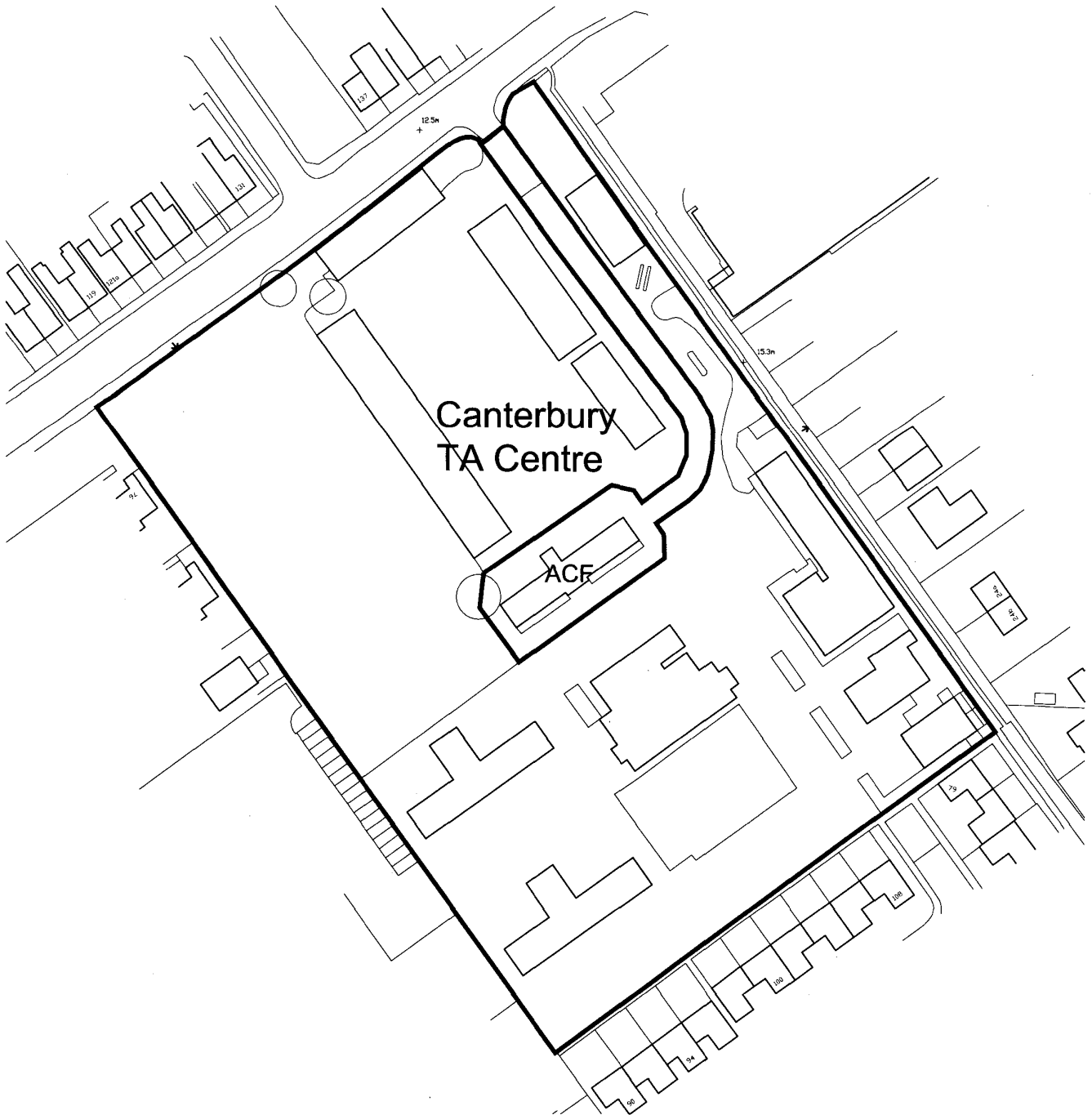


50 CONCRETE BLINDING.

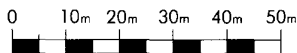
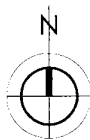
150mm WELL COMPACTED, WELL GRADED TYPE 1 FILL

• ANY SOFT SPOTS TO BE REMOVED AND FILLED WITH TYPE 1 FILL.





Location Plan  
AS EXISTING  
Scale 1:1250



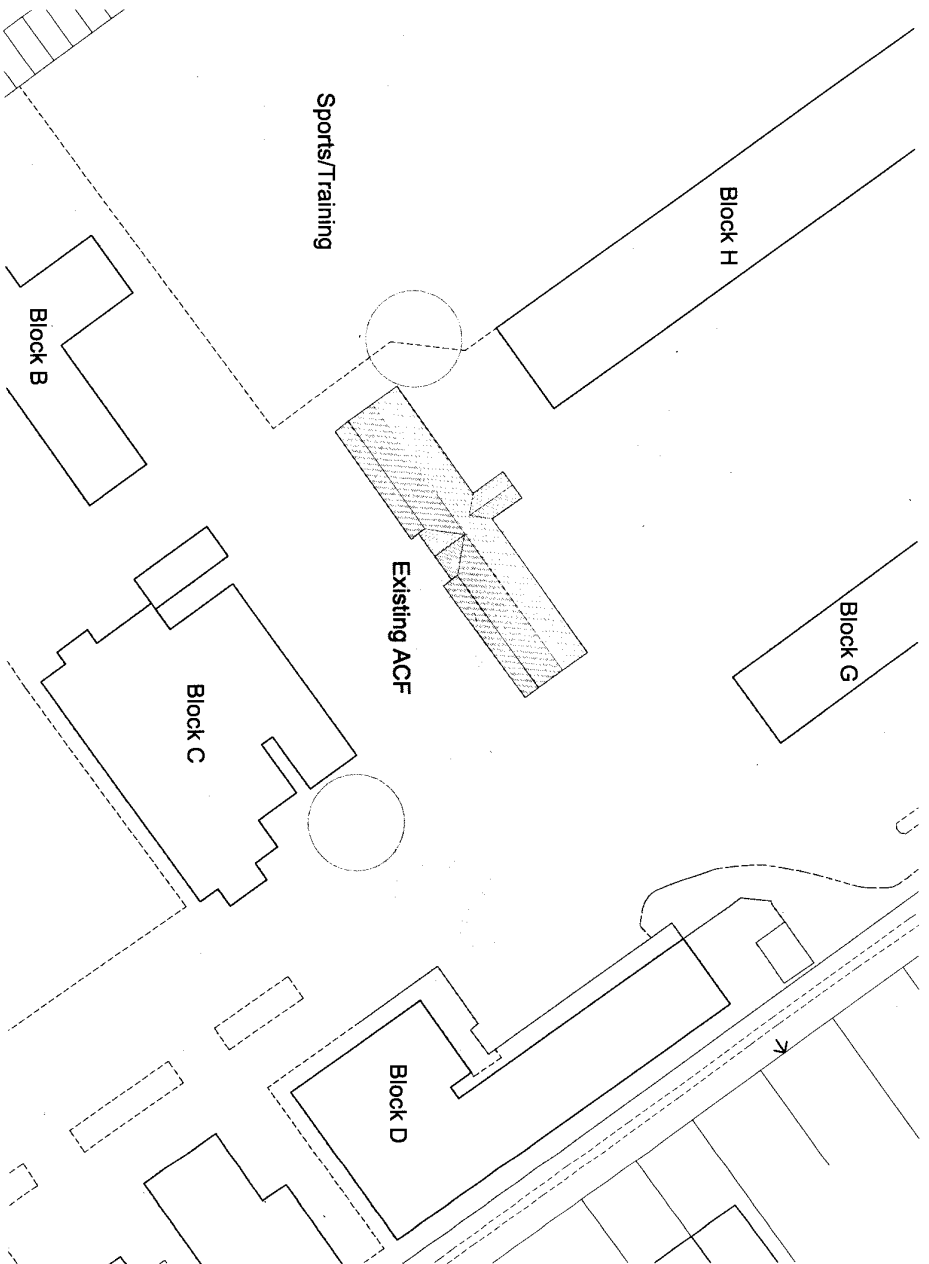
No.	Description	Date	Project Title:	Drawing Title:	Date:
			ATC/ ACF Canterbury SERFCA	Location Plan AS EXISTING	Dec '13
					Scale: 1:1250
					Drawn: RSS
					Checked: MS
					Drawing Number: 3644.00
					Revision:

**SC Architecture**  
Anchor House, School Lane  
Chandlers Ford, Eastleigh  
Hampshire SO53 4DY

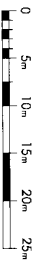
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Site Plan  
AS EXISTING  
Scale 1:500



No.	Description	Date



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 Hampshire, SO53 4JY  
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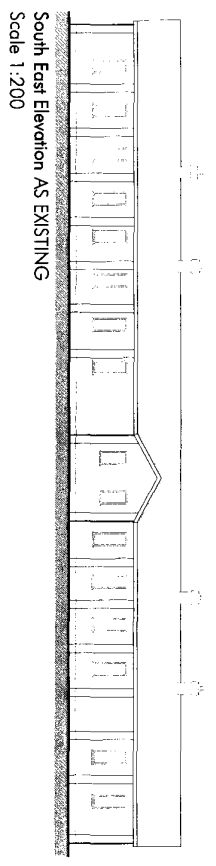
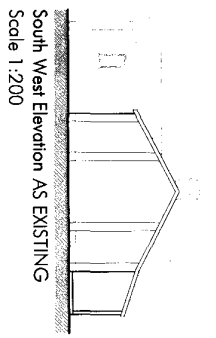
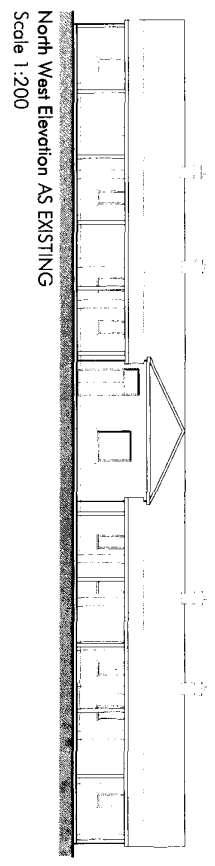
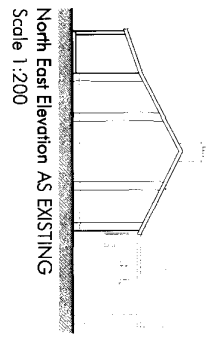
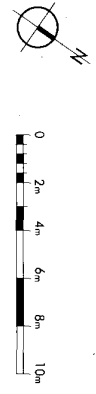
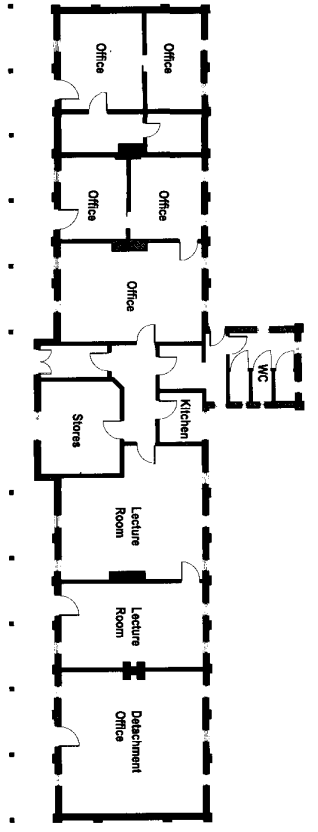
Drawing Title:  
Site Plan  
AS EXISTING

Project Title:  
ACF / ATC  
Canterbury  
SERFCA

Drawing No.:  
**3644.01**

Revision: -  
Date: Dec 13  
Scale: 1:500  
Drawn: RSS  
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Drawing Title:  
**Floor Plan & Elevations  
 AS EXISTING**

Project Title:  
 ACF / ATC  
 Canterbury  
 SERFCA

Drawing No.:  
**3644.02**

Revision: -

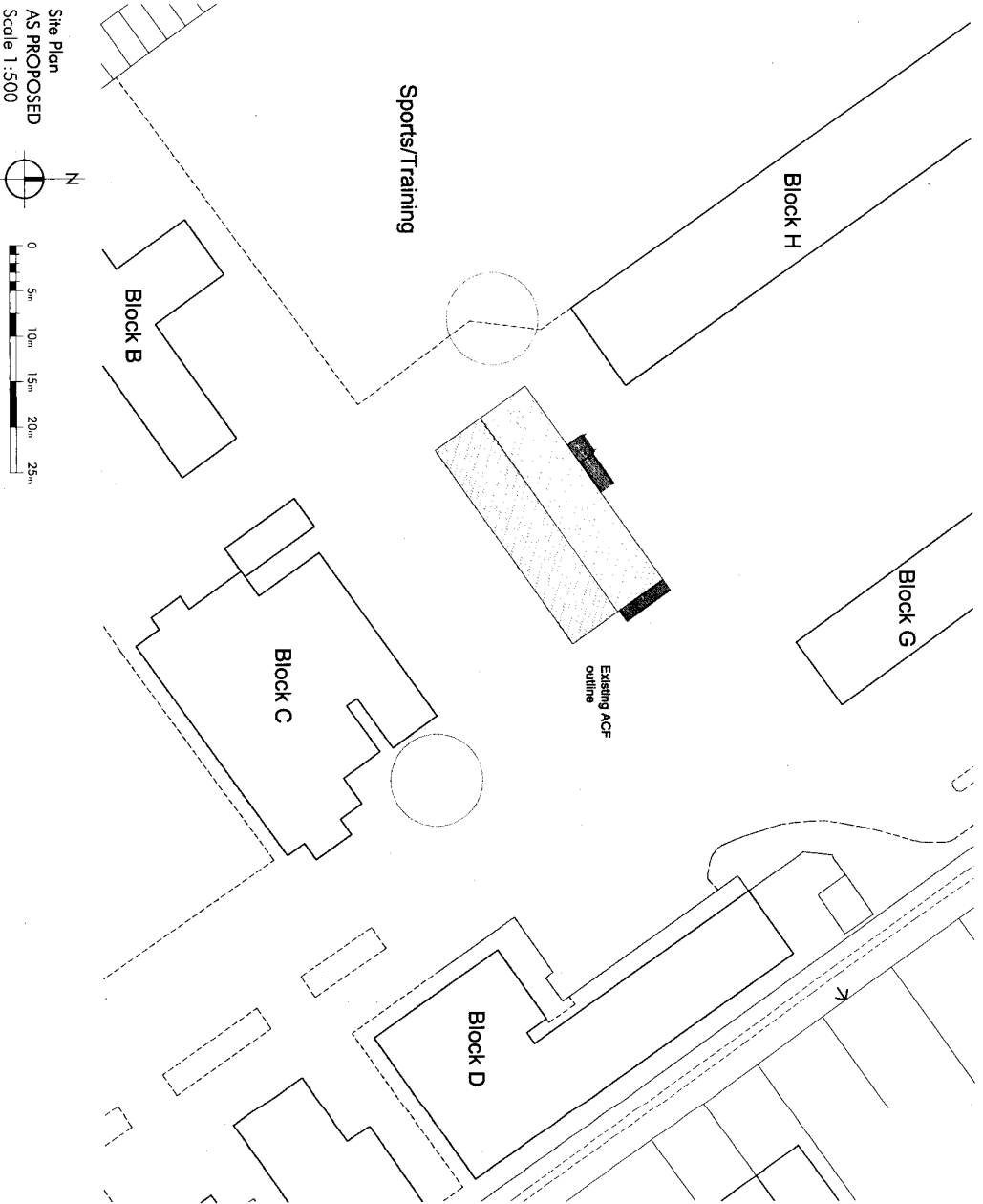
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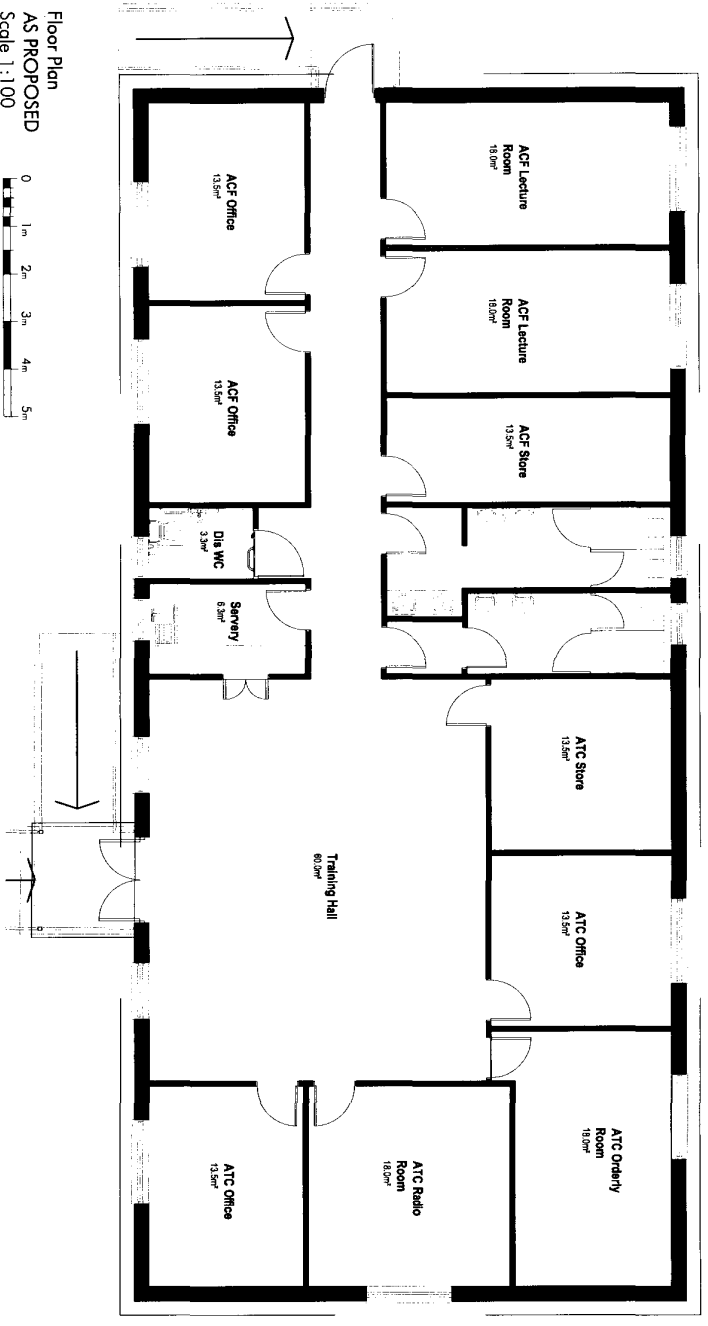
Drawing Title:  
**Site Plan  
 AS PROPOSED**

Project Title:  
**ACF / ATC  
 Canterbury  
 SERFCA**

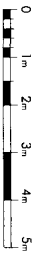
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Floor Plan  
AS PROPOSED  
Scale 1:100



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**SC Architecture**  
 Arterton House, 52 Wood Lane  
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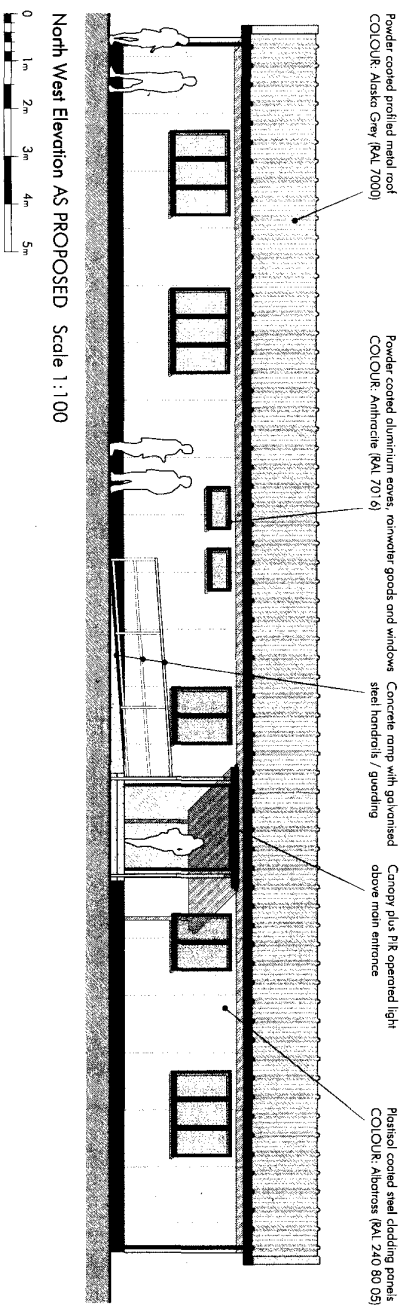
Drawing Title:  
**Floor Plan**  
**AS PROPOSED**

Project Title:  
**ACF / ATC**  
**Canterbury**  
**SERFCA**

Drawing No.:  
**3644.04**

Revision: -  
 Date: Dec 13  
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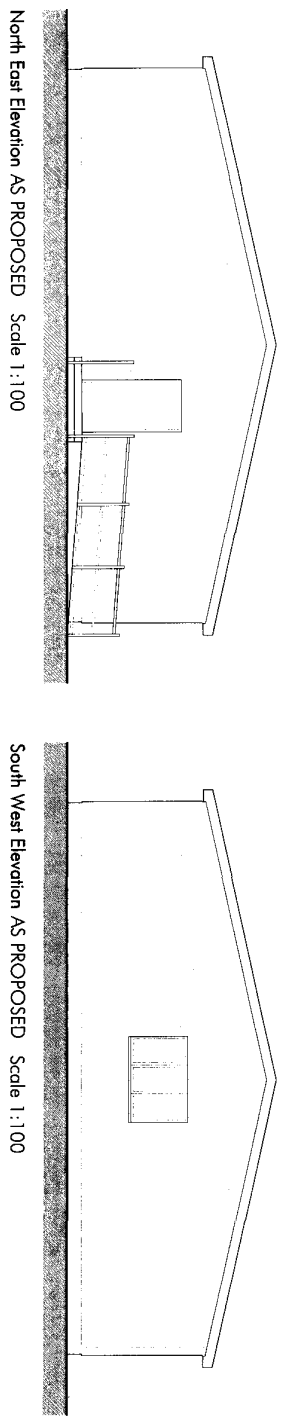
Powder coated profiled metal roof  
COLOUR: Alaska Grey (RAL 7000)

Powder coated aluminium eaves, rainwater goods and windows  
COLOUR: Anthracite (RAL 7016)

Concrete ramp with galvanised steel handrails / guarding

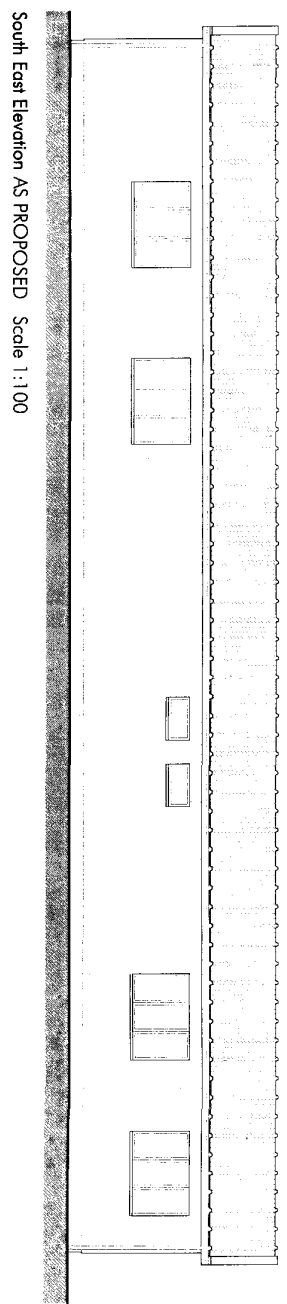
Canopy plus IR operated light above main entrance

Polystyrene coated steel cladding panels  
COLOUR: Albatross (RAL 240 80 05)



North East Elevation AS PROPOSED Scale 1:100

South West Elevation AS PROPOSED Scale 1:100



South East Elevation AS PROPOSED Scale 1:100

No.	Description	Date

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 Architects, Planners, Engineers  
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Drawing Title:  
 Elevations  
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Project Title:  
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Drawing No.:  
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