BASE BUILD SCHEME REQUIREMENTS

NEW WAREHOUSE UNITS

PHASE 1

UNITS 2 and 3

HANDCROSS, CRAWLEY

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GOODRICH CONSULTING LLP

INDUSTRIAL UNIT, HANDCROSS,

SCHEME REQUIREMENTS FOR BASE BUILD WORKS

1.00 GENERAL

1.1 Location

The site is situated at Handcross, Crawley as identified on site plan drawing reference no 2125 P400A.

1.2 Description of Development

The development comprises the design and construction of 2no single storey warehouses, with a clear height to underside of haunch of 6.6 metres; together with associated car parking, service yards, drainage, landscaping and incoming services.

Capable of sub division to provide 3 units.

1.3 Area Requirements

The minimum Gross Internal Floor areas of the building shall be as set out below:

	sqm	**sqft**	**Height to haunch**
Unit 2 Warehouse (incl GF entrance lobby)	931	10,023	6.6m
Unit 2 First floor office	95	1023	
Unit 3 Warehouse (incl GF entrance lobby)	2,795	30,093	6.6m
Unit 3 First floor office	164	1772	
TOTAL GROSS INTERNAL AREA	**3,985**	**42,911**	

HTC drawing 2125/ CSK15

In the event of any of the 'as built' areas when measured in accordance with the Code of Measuring Practice published by RICS and ISVA, being less than that stated in the table above, a penalty of £150 for each and every square foot or part thereof of Gross Internal Floor Area shortfall shall be deducted from the Contract Sum. Should any shortfall exceed 2.5% of a stated area the building will not be accepted. Note the area measurements and overall dimensions / penalties are based on individual totals for each unit, they cannot be measured and deemed as totalled.

1.4 Drawings

The drawings which will form part of these Employer's Requirements as defined in Article 4 of the Conditions of Contract, have been prepared by:

HTC Architects
PRP Consulting Engineers

These are as listed in Appendix A.

Contractor to provide fully detailed design information including provision of all calculations and working construction drawings for comment including any Mechanical and Electrical design information.

Contractor to give the Employer and their advisors, 2 weeks to review and comment on any Contractor proposal and highlight any divergence from Employer's Requirements documents.

1.5 Building Heights

Production / Warehouse Area - Minimum clear height to underside of haunch shall not be less than 6.6 metres.

1.6 Appearance

The buildings shall generally be clad in insulated profiled colour coated steel cladding sheets to walls. Insulated profiled colour coated steel sheets to roofs and composite cladding panels. To elevations facing the A23 Highway and front of the unit is to be bays of horizontal timber/ timber effect cladding alternating with vertical steel cladding as required by the local Planning Authority.

With colour coated polyester powder finish, aluminium windows and doors and with coloured service doors, entry doors and personnel doors. Types and colours of all external materials are to be approved by the Planning Authority; however physical samples are to be agreed by the Employer's Agent.

1.7 Design and BREEAM Rating

The Contractor's design development shall be such that the buildings shall require low maintenance and running costs. They shall be aesthetically pleasing, visually balanced and all units shall be of a similar design so that the development has an integrated appearance.

The approach to design adopts conventional techniques, materials and detailing and endeavours to provide a flexible "base building" which will be fitted out by incoming occupiers. For the avoidance of doubt this document sets out only the scope of works in respect of the "Base Building."

The design shall be in accordance with current Regulations and standards, which shall be approved by the Local Authority or other delegated body for the purposes of the Town and Country Planning Acts, Building Regulations and all other relevant Regulations, including the requirements of the Local Fire Prevention Officer and regional fire Acts of Parliament. The materials, workmanship and construction shall be in accordance with all British Standards and Code of Practice and executed to manufacturers recommendations, but not limited to:-

- Construction (Design and Management) Regulations (CDM) 2015 and, when complete, the design shall take into account the relevant requirements of the Workplace (Health, Safety and Welfare) Regulations 1992.
- Environmental Protection Act 1990
- Construction (Health, Safety & Welfare) Regulation 2007
- Health and Safety at Work Act 1974
- Electricity Equipment Safety Regulations 1994
- Water Supply Regulations
- IEE Regulations
- B&ES (HVCA) Specifications
- British Standard Codes of Practice
- CIBSE Guides, Codes, Commissioning Procedures and Technical Memoranda

- BRE digests and technical publications
- European product directives
- Water Resources Act 1991
- Environment Agency
- (The Disability Discrimination Act 2005) – Occupier item
- LPC Design Guide for the Fire Protection of Buildings
- (Sustainable and Secure Building Act 2004) – Energy
- The Gas Safety Regulation
- Clean Air Acts
- Building Regulations
- Specific requirements of the Utility Local Authorities
- Local Planning Authority
- The Factories Act

The design should achieve the client's requirement for an EPC rating of 'A' with relevant iSBEM calculations.

The design should give consideration to the client's requirement to achieve a BREEAM rating of 'Very Good'.

It is the responsibility of the incoming occupier to satisfy the requirements of the local fire service and obtain the necessary licence / consent.

Note all U values stated within the document are a minimum and are subject to thermal modelling being undertaken.

1.8 Materials and Workmanship

All materials for the works, unless otherwise stated, shall comply as a minimum with the latest relevant British Standard or British Code of Practice or European Union equivalent and Local Authority requirements. All workmanship shall be in accordance with the recommendations of the latest relevant British Standard Codes of Practice and / or trade suppliers, manufacturers, representative bodies, Codes of Practice and recommendations of Local Authorities and good common building practice.

The following materials shall not be used for the works:

Any materials which by their nature or application contravene any British Standard or British Code of Practice or European Union equivalent current at the time of specification and/or use including but not limited to those specified in the Building Contract and/or any materials generally known within the construction industry at the time of specification and/or use to be deleterious.

In addition to using Waste Resources Action Programme (WRAP) to review the design to specify increased use of recyclable material and wherever possible utilise recycled components, recycled aggregate and use local suppliers.

1.9 Deleterious Materials

The Contractor shall ensure that the following materials have not been used and are not specified by it for use in the construction of the Works:

Any materials which by their nature or application contravene any British Standard or British Code of Practice or European Union equivalent current at the time of specification and/or use including but not limited to those (if any) specified in the Building Contract and/or any materials generally known within the construction industry at the time of specification and/or use to be deleterious.

1.10 Health & Safety File

The Contractor shall provide **three** paper and **three** electronic **interactive** copies of the information required by the Principal Designer to compile the Health & Safety File for the Project. The information shall be agreed with the Principal Designer and will generally consist of the following:

Residual Hazards
Any which remain and how they have been dealt with, e.g. Asbestos Surveys and completion reports, contaminated land, water bearing strata, buried services, etc.

Key Structural Principles
Bracing, sources of stored energy- including pre and post tensioned members. Safe working loads of floors and roofs.

Hazardous Materials
Oils, lubricants, lead paints, special coating which cannot be burned off.

Removing or Dismantling of Installed Plant and Equipment
Information regarding the dismantling, lighting and removal of installed equipment such as air handling units, chillers, or equipment that was installed in sections and when installed operates as a single piece of equipment that cannot be removed as a single piece of equipment.

Cleaning and Maintenance
Health and safety information about equipment provided for cleaning and maintenance of the structure. The Contractor shall provide a schedule referencing Safe Systems of Work contained within the Operation and Maintenance Manuals shall be contained within the Health & Safety File.

Services
The nature, location and markings of significant services, including underground cables, gas supply equipment, fire fighting services, etc.

As-Built drawings and information
Information and as-built drawings of the structure, its plant and equipment, i.e. means of safe access to and from service voids, fire doors for fire compartmentation, etc.

Access Statement
Details of disabled access, provision for the disabled and compliance with DDA.

Health and Safety file should include:

(a) Equipment Manuals
(b) System Description
(c) Contact Details
(d) Commissioning Data
(e) Test Certificates

(f) Specific manufacturers information
(g) Provision for the recycling of materials, within general maintenance and also at end of life.
(h) Building User Guide

A draft copy of the information for review by the Principal Designer shall be issued for comment 4 weeks prior to completion with the completed information provided to the Principal Designer 1 week prior to completion. Final electronic copies to be available 2 weeks after completion.

The timely issue of the draft Health & Safety File is a condition of Practical Completion.

1.11 Operation & Maintenance Manuals

The Contractor shall provide **three** paper and **three** electronic **interactive** copies of the Operation & Maintenance Manuals. The content of the manuals shall be in accordance with BSRIA BG1/2007 and as agreed with the Employer's Agent. Discussions shall be held with the Principal Designer to ensure Safe Systems of Work in the manuals are referenced within the Health & Safety File.

A draft copy of the manuals for review by the Employer's Agent shall be issued for comment 4 weeks prior to completion with the completed information provided to the Employer's Agent 1 week prior to completion. Final electronic copies to be available 2 weeks after completion.

The timely issue of the draft Operation & Maintenance Files is a condition of Practical Completion.

1.12 Building Log Book

The Building Log Book shall be provided in accordance with Building Regulations and to CIBSE TM Guidance incorporating all requirements of the BREEAM assessment.

A draft copy for review by the Employer's Agent shall be issued for comment 4 weeks prior to completion with the completed information provided to the Employer's Agent 8 week after completion.

1.13 Spares

As identified in following sections. However generally two boxes of carpet tiles, ceramic wall and floor tiles and suspended ceiling tiles shall be provided to each unit at Practical Completion. These are to be of the same batch as installed products.

1.14 Maintenance Access

Any item requiring periodic maintenance of five years or less shall be positioned to allow safe access for servicing staff.

All plant installed to be provided with clear safe access to areas requiring servicing.

1.15 Exclusions

All Tenants' / Purchaser's fitting out items including:

- Cellular offices, sliding folding partitions and the like

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- Lockers
- Canteen / kitchen / server – note area for Kitchenette/ tea station including service points adjacent toilets included.
- Vehicle wash and fuel islands
- Any specific requirements of Funders insurance company which are an enhancement of the statutory technical standards
- Materials handling equipment
- Fire fighting equipment.
- Sprinkler systems - sprinkler installations (including tanks and pump house), hose reels, smoke ventilation and hand-held fire extinguishers
- Security alarms, intruder alarms and CCTV installations
- Door Entry System, telephone and data systems.
- Internal signage other than required for Fire Exit and Building regulation approval.
- Furniture, furnishings, blinds, lockers, shelving, machinery, racking, skips, or any other item which has not been expressly detailed in this document.
- All Warehouse lighting, heating and fire / smoke detection.
- Mechanical, heating, extract and electrical installations within the warehouse / production area other than that specifically noted in this document.
- Any Tenant space heating to be in compliance with Part L2A and SBEM calculation.
- Intruder detection system.
- External signage and connections to the base build structure
- Supply agreements for permanent supplies.
- Diesel tanks and generators
- Mezzanine floors
- Cat B Fit Out works.
- Any other item that has not been expressly detailed within this document

2.00 WAREHOUSE BUILDING ENVELOPE

2.1 Geotechnical Report

A ground investigation report has been prepared by Wardell Armstrong Reference ST16154-RPT-0002 dated June 2017 and a copy of this report are included within this Employer's Requirements document. The Contractor must satisfy himself as to the adequacy of this investigation and report and as necessary carry out any further investigations so as to establish the detailed sub-structure and foundation design. The employer is not providing reliance upon the ground investigation report.

All works necessary in the sub-structure foundation shall be designed to meet the loading requirements in these Scheme Requirements taking into account the ground conditions.

2.2 Site Clearance

A demolition contract package has already been undertaken to clear the site. However the Contractor will need to be aware that there may be further below ground services or obstructions not contained on any record drawings. Remove any unsuitable or contaminated materials from site to an approved, licensed tip. The Contractor to allow for any additional site excavation to formation level and graded, trimmed and compacted as necessary with approved selected material.

2.3 Earthworks and Ground Improvement

Excavation shall be carried out to formation level over the area of the building as indicated on the drawings.

As necessary ground improvement works shall be carried out in full accordance with the requirements of the Structural Engineer and to the approval of Building Control.

2.4 Sub-Structures

The foundations and sub-base for the structural frame will be designed by the Contractor's Engineer in accordance with BS 8004:1986 and/or BS EN 1997-1:2004: Geotechnical Design and take account of the findings and recommendations of a soils investigation report and be constructed to Local Authority approval. Concrete work to comply with BS 8110:1997 and/or BS EN 1992 – 1-1, the Structural Use of Concrete.

Sub-base material shall be a minimum granular type 1 material to Clause 8.04 of 'Specification for Road and Bridge Works' and to the approval of the Structural Engineer. Recycled aggregates to be utilised where practical, however testing of recycled aggregates shall be undertaken by an independent monitoring company to ensure compliance with GAC requirements.

All necessary hardcore and filling shall be carried out from the subsoil contours to the formation levels of the building in materials approved by the Structural Engineer.

Concrete ground beams shall be in-situ or precast to suit the Structural Engineer's details. Galvanised steel channels may be used as an alternative. Where steelwork is used below or at ground level in lieu of concrete ground beams, all steelworks shall be provided with drilled drainage holes to prevent standing water.

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The concrete foundations and ground floor slabs shall be designed and constructed in reinforced concrete in accordance with the relevant Codes of Practice and shall incorporate suitable gas precaution measures agreed with the Building Control Officer. Concrete stanchions bases, retaining walls and strip footings shall be a minimum 30N/mm^2 28 day strength OPC concrete or such other concrete as specified by the Structural Engineer, including all necessary reinforcement and supply and fixing of holding down bolts, as required.

The concrete shall provide the necessary protection against sulphate attack in accordance with BRE digest 363.

The ground floor slab shall be a mesh reinforced concrete slab to specialist design, minimum design thickness 200 mm with a power floated finish will be provided to all ground floor areas within the building. The slab will be designed in accordance with the recommendations of TR34 fourth edition, for a maximum loading of 50kN/m^2 and the rack loadings stipulated in the following table placed in a back to back situation (with centre line base plates 140mm x 100mm size, placed a minimum 350mm apart and a minimum distance 150 mm away from floor joints) anywhere on the floor.

Height to Haunch	Rack Leg Load
6.6m	7.0 Tonnes

Where joints are provided in the construction of the floor, they should be generally detailed in accordance with TR34 and designed so that no vertical movement occurs across the joint. Where possible the number of joints should be kept to a minimum.

Joint location should be co-ordinated with a notional racking layout, unless a fixed layout is available, and agreed with the Project Manager. Where a final racking layout has been provided (a minimum 6 weeks prior to pouring floor slab) joint location will be co-ordinated with this layout and agreed with Funders Representative. Day joints should be tied or reinforced with 10mm minimum thickness arris protection e.g. Permaban Alpha Joint or equal approved.

The concrete is to be in accordance with BS EN206 and have a minimum compressive strength of 50N/mm^2 at 28 days. The concrete will have a minimum cement content of 1000lb/ft^2, with a maximum water cement ratio of 0.50. The concrete shall be designed to have a maximum slump of 75 mm due to water, the use of super-plasticizers will be permitted to obtain the workability required by the sub-contractor for placing the concrete.

Lignite is not permitted for use as an aggregate.

Prior to construction of the slab, the proposed concrete mix is to be tested to show that its coefficient of drying shrinkage is less than 0.045%. Tests are to be in accordance with BS EN 1367 pt 4.

The ground floor slab will be constructed so that the top surface tolerances comply with FM2 as defined in Concrete Society Technical Report 34, for free movement areas of the slab.

The floor is to be surveyed to prove its acceptance within fourteen days of construction.

After the final power floating operation, the floor slab is to be sprayed with an acrylic based, curing sealing and hardening membrane, with a curing efficiency of 90%. The floor shall not be trafficked by any vehicles for a minimum of four days (or as recommended by the manufacturer) following the sealing operation. Fully laden vehicles will not be allowed on the floor until the concrete has reached its design strength.

Radon barriers shall be installed where required.

The ground slab is to be constructed on a 1200 gauge PIFA polythene damp proof membrane laid on a layer of hardcore with a minimum thickness as stipulated on the engineer's drawings.

The hardcore is to be laid to the specific minimum thickness in layers and compacted using a 10 tonne dead weight roller with a minimum of 4 passes in each direction perpendicular to each other. Where necessary, the hardcore layer can be blinded with a fine material to close the surface, sand must not be used. The surface tolerance of the hardcore will be +5 mm and –25 mm.

Prior to concreting the slab, all roof and wall sheeting and loading doors must be fixed to provide protection from wind and rain. If due to programme restraints this cannot be achieved, then temporary sheeting must be used to seal all openings.

All joints are to be sealed prior to practical completion with sealing compounds having a minimum shore hardness of 40. These joints are to be inspected at three monthly intervals by the Contractor during the defects liability period and checked for arris damage. Any significant arris damage must be repaired with an epoxy mortar placed in accordance with the manufacturer's recommendations. At the end of the defects liability period, the trafficked joints in the aisles or free movement areas of the floor slab are to be resealed. The sealant shall be a minimum shore hardness of 80 for sawn joints and of a suitable shore hardness for the design width of movement joints.

All efforts should be made in the construction and detailing of the floor to reduce the possibility of random cracking. If cracks do occur, they are to be pressure grouted with a low viscosity epoxy mortar if they are wider than 0.8 mm.

The Main Contractor shall include for all gas protection measures deemed necessary, with the approval of the Structural Engineer and Building Control.

The ground floor slab shall be monitored by an independent consultant, Face Consultants or Monofloor. Works shall include agreement of the design specification, concrete mixes and monitoring of quality on site throughout the pouring process. Any comments raised shall be incorporated by the Contractor at no cost to the Employer. On completion of the floor slab a sign off report shall be issued.

2.5 Structural Frame

The structural frame shall be clear span portal frame type with a minimum height from finished floor level to the underside of haunch as noted previously. The frame shall be designed so as to span each entire unit, with internal column positions to be agreed with the Employer prior to placement of order. The roof shall be a curved roof. The design of the structural steel frame shall be in accordance with all British Standards, Building Regulations and National Structural Steelwork Specification.
Bracing is to be CHS and is to be kept free from open areas / internal stanchions, door, window openings and the like.

The frame installations shall include all main stanchions, roof beams, purlins, cladding rails and raisings. The frames shall be capable of supporting a service load of 0.25 kN/m^2 (over the whole roof) for mechanical and electrical installations, excluding heating and sprinkler installations. Note this load does not include any allowance for PV installations and the Contractor shall include an allowance as required for PV's and load to satisfy building regulations/ or planning as required.

Cold rolled sheeting rails and purlins shall be manufactured from pre-hot dipped galvanised mild steel and left undecorated.

All externally exposed surfaces of steel framework shall be decorated with 2 coats of oil paint to an approved finish.

Fire Protection to the structural frame shall be in accordance with Constrado recommendations where required by Building Regulations and the Fire Officer. Protection shall be carried out internally, using fireproof sheeting, similar cladding, intumescent paint or concrete block encasing, all to the satisfaction of Building Control.

The steelwork will be designed and constructed to allow the building envelope to achieve compliance to Technical Standards 6.1. All purlins and rails will be fixed in accordance with manufacturer's recommendations and will have a minimum thickness of 1.45 mm to assist a positive cladding fixing. All sheeting rails within 2.0m of FFL to be installed 'toes down' to prevent build-up of debris.

All steelwork will shot blasted to BS 7079, second quality, before painting with one coat of epoxy 2 pack high build zinc phosphate to a nominal dry film thickness of 75 microns to give 10 years life to first maintenance, finished colour to be light grey. Cold formed sections will be manufactured from hot dipped galvanised coil to BS EN10147: 1992 and BS EN10143: 1993.

Any damage to steelwork at completion shall be touched up with paint colour to match steel frame as delivered to site to Employers satisfaction.

Consideration shall be given to reflect the requirements of expansion joints within the cladding system.

2.6 Roof

The roof cladding shall be fixed in accordance with the recommendations of the manufacturer and a Confidex guarantee is to be provided.

Where drawings conflict between architectural and structural to the roof area, the roof shall be a curved apex clad roofing system, specification to match below.

Steelwork / roof design shall be designed to incorporate any load requirement for PV's / sustainable measures required.

The roof, roof lights and rainwater goods are to provide a manufacturer's warranty for the entire installation for a period of 25 years. The cladding must be installed by a cladding contractor trained in the installation of the roof and wall systems.

The insulation to be non-combustible glass fibre and to achieve a minimum designed thermal U-value of 0.23W/m²K.

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The roof system is to be covered by BBA Agrément Certificate 07/4428. The roof and wall cladding systems are tested in accordance with LPS1181 to achieve a minimum grade 'EXT-B' certification, certificate reference LPCB 443a. The internal lining to the main roof will be Class O (roof lights Class 1) rating for surface spread of flame as tested to B.S. 476 Part 7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

The installed roof and roof light systems are to be minimum Class B Non-Fragile for a period of 25 years, tested in accordance with the HSE materials standard ACR(M)001:2011 'Test for Non-Fragility of Profiled Sheeted and Large Element Roofing Assemblies (fourth edition)'.

The roof shall be wind and watertight and constructed from insulated profiled steel cladding with a British Colorcoat HPS 200 (Standard Colour) outer sheet with a minimum thickness of 0.7 mm, insulation and enamel finished inner lining sheet, together with all vapour barriers and / or breather membranes as required. The roofing shall be suitable for laying to the recommended pitch as specified by the Manufacturer.

End lap joints shall be positioned directly above a support spacer with painted cut edge uppermost. Side lap joints shall be lapped away from the prevailing wind wherever possible. Sealing of joints shall be in accordance with the manufacturer's written instructions.

Fire protection shall be incorporated as necessary in accordance with the requirements of the Building Regulations and the Fire Officer's recommendations.

The roof shall incorporate an area of evenly distributed GRP roof lights with a minimum area of 10% of the warehouse / production area space. Roof lights shall be of 'Mansafe' durability to comply with current health and safety requirements, translucent and of a double skin construction, site assembled.

An adequate number of anchor points fixed back to the steel frame and evenly distributed shall be provided to the ridge of the unit and to a line across one slope of the roof.

Roof drainage shall be provided to satisfy BS EN 12056-3:2000 Category 3 based on a 25 year unit life i.e. the entire system shall be designed for 112.5 year return life.

Rainwater goods shall be designed and installed to comply with the requirements of the latest British Standard and Codes of Practice. Gutters shall be complete with all necessary brackets, stop ends, outlets, etc and gutters shall discharge into square section, external metal down-pipes, colour coated to match the cladding.

Any gutters within the building fabric shall be insulated.

Syphonic roof drainage shall be routed round the perimeter of the unit and no part of the installation shall be below the level of the haunches to the structural frame.

Detail work to ridge, eaves, roof lights and gables will be in accordance with the manufacturer's recommendations and approved design details. Fixings shall be stainless steel to both walls and roof.

Horizontal Life Line System

An appropriate horizontal life line system will be incorporated to permit safe roof and gutter access for maintenance purposes. Method of safe access from ground level to roof level will be defined in the Health and Safety File to an identified point to comply with the requirements of the Construction (Design and Management) Regulations. This shall be a permanent access route.

Where required a permanent roof access hatch and access ladder will also be provided to allow access and egress to the roof and should be situated to allow safe connection to the horizontal life line system installed.

Rainwater Goods

Perimeter gutters are to be membrane lined gutters (single skin or insulated depending on location). Boundary and gutter material will be a minimum 1.5mm thick nominal pre-galvanised steel, complete with 1.5mm PVC pre-laminated membrane, in accordance with the Metal Gutter Manufacturers Association (MGMA). The gutter system is to have a minimum 25 year guarantee to match the roof system. All internal gutters to be factory insulated using rigid 50mm thick rock fibre insulation.

Syphonic drainage system is to be utilised on this project.

The drainage system shall be designed and constructed to comply with BS EN12056-3:2000 and the following design criteria;

- The geographical location of the building;
- A building design life of 25 years;
- A ‘Category 3’ risk protection.

All pipework to be installed above the portal haunch level to maintain minimum clear height and internal rainwater pipes are to be located within the web of the steel and suitably protected to prevent against accidental damage.

All components of the system shall be in accordance with any relevant British or European standards.

The rainwater outlets will be distributed evenly along the total gutter length and where practically possible outlets should be at the mid bay position of the gutter with quantity and size to suit syphonic design. Discharge locations to be agreed with the Client / Architect. Secondary eaves downpipes intermittently spaced along the eaves are not acceptable.

Syphonic pipework shall be firmly attached to an engineered continuous railing system, using appropriate pipe clamps to be securely fastened back to the main structure at a maximum of 22m centres, to provide adequate and proper restraint against thermal movement. Additional bracing will be provided within 100mm of the closest edge of the pipework, end branch connections and where required.

Indicative weir arrangements will be provided to ends of valley gutters and at 50m intervals on perimeter gutters to provide advance warning of blockages on the syphonic system.

Fire protection shall be incorporated as necessary in accordance with the requirements of the Building Regulations and the Fire Officer’s recommendations.

An independent cladding inspector shall be appointed to review both the wall and roof cladding, with interim and final compliance reports to be provided noting all defects within the works are resolved and the installation complies with the British Standards, LPC and manufacturers recommendations. Inspection sequence to be agreed with the Employer, however as a minimum during the erection, prior to closing out of areas and a final sign off (usually a 3 week inspection routine).

2.7 External Walls

Profiled Cladding

Profile choice, colour arrangement, orientation and layout of panels to be as agreed with Local Planning Authority to suit the approved elevational treatment. Refer to drawings for project specific information.

External walls shall be composite cladding and built up (or resemble a “composite” aesthetic). composite profiled steel sheet cladding 0.55 mm thick galvanised steel sheeting to BS 2989 and with BSC colour coat plastisol external finish from the standard range of colours with insulation and enamel finished liner sheet, fixed outside cladding rails. The wall cladding shall be wind and watertight and achieve an overall U value equal to or better than Part L2 of the current Building Regulations. The external wall cladding shall be installed complete with all necessary trims, flashings, clips and the like in a contrasting colour coated pressed steel.

The insulation to be non-combustible glass fibre and to achieve a minimum designed thermal U-value of 0.35W/m²K. Subject to iSBEM requirements.

The wall systems are to provide a manufacturer’s warranty for the entire installation for a period of 25 years. The cladding must be installed by a cladding Contractor trained in the installation of the roof and wall systems.

The wall cladding systems are tested in accordance with LPS1181 and 1208 to achieve a minimum grade ‘EXT-B’ certification, certificate reference LPCB 443a.

The internal lining to the main roof will be Class O rating for surface spread of flame as tested to B.S. 476 Part 7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

Cladding inspections, with interim and final compliance reports to be provided noting all defects within the works are resolved and the installation complies with the British Standards, LPC and manufacturers recommendations. Inspection sequence to be agreed with the Employer, however as a minimum during the erection, prior to closing out of areas and a final sign off (usually a 3 week inspection routine).

The exterior walls shall be designed to satisfy fire boundary conditions in accordance with Building Regulations.

Timber Cladding

Horizontal timber/ timber effect composite cladding to be provided where indicated on drawings with hidden fixing system. Cladding to provide minimum 25 year maintenance free life. Cladding to be Class B Fire Rated where required. Subject to Employers approval.

Airtightness

An air-tightness test is to be carried out to the whole building by the Main Contractor prior to the Client obtaining access. This test must conform to all current legislative requirements and Building Regulations. The air test should, as a minimum, comply with BS EN13829: 2001 and to be a minimum requirement of 2.5m³/hr/m² @ 50 Pa positive air pressure to comply with (and improve on) Building Regulations Approved Document Part L2A. A copy of the resultant report is to be provided to Client / Developer. Any defects, etc, highlighted by the test are to be rectified by the Main Contractor prior to practical completion. This test is to be carried out whether or not required by the Building Control.

When attending site to carry out the air-tightness test, the testing house are to bring with them all equipment to carry out a smoke test, thus aiding the rectification of any defects. This test, if required, can be carried out on the same day as the air-tightness test, therefore, causing minimum disruption to progress on site. This test is to be carried out whether or not required by the Building Control Officer.

2.8 External Doors

Doors shall be located as identified on the drawings and shall be designed to be wind and watertight and take into account the particular site location and exposure and shall have been tested in accordance with the requirements of BS 6375.

All external doors shall comply with Part L2 of the current Building Regulations.

Any external Entrance doors shall be Polyester Powder coated Aluminium and provided with door closers, door stops, security locks and thumb turn mechanism with polished aluminium door handles to both sides of door leaf.

All locks shall comply with the appropriate requirements of the insurance company's security requirements. Three sets of all keys to external doors shall be provided.

Warehouse Fire exit and personnel doors shall be proprietary solid cored to achieve required fire resistance, steel construction in steel frames, gloss painted, complete with appropriate ironmongery and panic bars. For security reasons, doors shall not be openable from the outside.

Handrails and balustrades shall be provided in circular hollow, hot dipped galvanised mild steel sections. Steel staircases shall be provided with drilled drainage holes to prevent standing water.

2.9 Level Access Doors and Equipment

Doors to be Stertil-Stokvis Thermadoor model 640 or equal and approved, to consist of electrically operated insulated vertical lift with beam support low level springs for ease of future maintenance. The rigid panels to be manufactured from two skins of galvanised steel, in filled with polyurethane foam, designed to achieve a 'U' value to meet or better the requirements of the current Building Regulations. A continuous thermal break is to be provided between inner and outer skins. EPDM seals to be fitted to the top, bottom and sides of the door to prevent rain penetration and minimise draughts. Controls to be single impulse open and hold-to-run to close.

Finger-trap protection to panel joints inside and out. Minimum opening size to be 4.8m high x 4.0m wide. To include 3no double glazed acrylic vision windows. External colour to be from standard polyester colour range, internal RAL 9002. The operator contains self-holding gears to hold doors in the event of cable or spring failure. (Anti-drop safeguard) including Anti-slack cable device CE marked with manufactures declaration of conformity Prevention of persons being lifted: (dead-man's control or torque limit on impulse control).

1.2m high, tubular-steel, protection bollards will be provided (2nr) on the external elevation and (2nr) on the internal elevation to each of the level-access door jambs. The bollards are to be primed, undercoated and have two coats of gloss paint applied in contrasting coloured bands.

2.10 Fire Precaution

The requirements of all relevant and current legislation at the time the works will be undertaken, including compliance with the Building Regulations, Local Authority Inspector and/or Approved Inspector and the Fire Precautions Act will be incorporated, as indicated on the production information drawings, in respect of means of escape, fire resisting doors and partitions, fire exit doors and fittings and all associated signs and notices.

Signs and notices will comply with Associated Signs and BS 5499: 2000 (or the equivalent standard at the time of the works) 'Fire Safety Signs, Notices and Graphic Symbols, Specification for fire safety signs'.
Any other requirements of the Local Authority Building Control Department with regard to provision of Sprinkler installations, smoke ventilators, hose reels, heat sensors, extinguishers and other firefighting equipment are specifically excluded.

3.00 WAREHOUSE BUILDING WORKS INTERNALLY

Unit 2 and 3 to be provided with office at first floor level with undercroft. Office Fit Out to include:

- o Raised access floor
- o Carpet to floor
- o Suspended ceiling and lighting
- o Decorated
- o Cooling/ heating
- o WC. Provision for toilets to ground floor. Provision for toilets to first floor Unit 3 only.
- o Lift space to upper floor. Space for lift installation by tenants at a later date where upper floors shown.

3.1 Structural Frame

The office structural frame will be constructed with structural steelwork as shown on the Structural Engineer's drawings. The frame designed to BS 5950: Part 1 and 2 will be fire protected to achieve a fire resistance as required under the Building Regulations, all generally in accordance with clause 2.4.

3.2 External Walls

Office area only to be provided with plasterboard finish shall be provided to the internal skin of external walls.

Ground floor undercroft shall be as warehouse external wall.

3.3 Upper Floors

Hollorib or Pre-cast concrete floor units shall be finished with a minimum 75 mm cement / sand or gyvlon screed, where tiled or vinyl floor finishes are to be applied. Prior to laying of finish, moisture readings shall be taken in conjunction with the Employer's Agent to ensure floors are suitable for finishes to be applied. Where moisture readings are high the main contractor shall make all necessary allowances / remedial action prior to laying of floors. Floors should be capable of a 4 kN/M² load plus a 1 kN/m² furniture/fitting load.

Where required, floors in the office area shall receive an MOB PSA PS/SPU modular galvanised steel encapsulated chipboard floor Kingspan RMG (medium grade) compliant proprietary raised access floor system, which shall be to the prior approval of the Client. The floor system shall comprise a full access floor. Voids must also be provided to allow cable connection through from all office areas.

Any raised access floor system shall be installed to provide a minimum clear void between the top surface of the structural floor slab and the underside of the raised access floor panels of 150 mm.

To provide insulation value between unheated warehouse and heated office space – 80mm insulation and 22mm chipboard to be provided internally to office space. Structural and thermal performance to be designed for associated static and live loadings.

The Contractor shall ensure that all junctions between floors and walls are properly sealed so as to maintain thermal, acoustic and fire resisting integrity.

3.4 Stairs

The main staircase and landing shall be constructed of concrete.

Handrails to the main staircase shall be formed in 45 mm diameter circular brushed stainless steel hollow sections. Balustrade to be formed with tensioned steel wires. Stair treads and risers shall be finished with carpet tiles and appropriate contrasting nosings.

Any joints and intersections stainless steel shall be fully butt-welded, ground, filled and polished to provide a final smooth finish. All joints, intersections, ramps and wreaths to hardwood handrails shall be properly mitred and rubbed down to give smooth close fitting joints without filling.

3.5 Internal Wall and Partitions

Where shown on the drawings any compartment wall between the office and warehouse areas or between units shall be whitewall composite panel construction of the appropriate construction and thickness to provide one-hour fire resistance. Any door or window opening within this wall shall be afforded the same degree of fire protection as required for the wall. Whitewall composite panels shall meet the LPC requirements.

Internal core walls to be constructed in proprietary stud partitioning using high density board such as Lafarge Megadeko or similar.

Fire resistant sealing/barriers at junctions between external walls and roofs are also to be provided as required.

3.6 Internal Doors

Internal doors shall be solid core, flush; self-finished in American light oak veneer and concealed lipped all round, all from a single supplier such as Shapland Leaderflush, Hazlin of Ludlow Ltd or equivalent quality supplier. Frames and architraves shall be hardwood to match door veneers. Doors shall be fire rated as necessary with glazed vision panels to comply with statutory requirements.

Doorstops shall be provided for all internal doors where the opening swing is less than 135 degrees.

Ironmongery shall be good quality satin anodised aluminium appropriate for office use, shall be approved by Client. To include push and/ or kick plates where required.

Unit 2 and 3 to be provide with a master key for all lockable internal doors.

Mortice latches with lever furniture are required to all doors with appropriate locks to toilets.

3.7 Wall Finishes

Internal walls to office areas shall be plastered or dry lined finish, painted with a mist and 2 full coats of vinyl matt emulsion.

Half height wall tiling shall be provided in all office toilet areas and ancillary lobbies with feature band. Feature band to be set nominally 1600mm AFFL or nearest whole tile.

The disabled toilet shall be suitably strengthened to accept grab rails. Wall tiles Zen Bianco 500 x 200mm.

The Contractor shall provide the Employer with two boxes of spare tiles of the original colour batches at Practical Completion.

Dow Corning or equivalent quality silicon sealant, subject to the Employer's right of rejection shall be provided around all junctions between tiling and sanitary ware.

Any window boards within office areas shall be a minimum 22 mm veneered moisture resisting board American light oak and shall have a bull nosed lipped leading edge with a 25 mm minimum projection.

3.8 Floor Finishes

Warehouse / production area floors shall be power floated concrete with a sealer finish.

Office
Office floor sub base finish is sand and cement screed. Irregularities in the surface of the screed shall not be permitted and shall be suitably finished to receive the specified floor finish.

When measured with a slip gauge to BS 8204: Part 1, Figure C1 or equivalent, the variation in gap under a straight edge (with feet) placed anywhere on the surface shall be not more than 5 mm under a 3m straight edge and 2 mm under a 1m straight edge. Liquid DPM to be applied to insitu concrete/screed surfaces if required.

Permissible deviation in the level of the surface shall be no more than $^{+}/_{-}$ 5 mm.
Office and staircase areas shall be fitted with medium duty CFS Tredline contract carpet 600 x 600mm tiles.

Reception area, office toilets, ancillary lobbies areas shall be provided with feature ceramic floor tiling/finish, with matching proprietary 200mm x 200mm skirting. Tiles shall be Marite Nero floor tiles 300 x 300mm.

The Contractor shall provide the Employer with two boxes of spare tiles of the original colour batches at Practical Completion.

Timber skirtings throughout shall be 25 x 100 mm American light oak.

Recessed mat-well incorporated within finishes and Desso Esco protect barrier tiles or equivalent quality, subject to the Employer's right of rejection shall be provided to the full width of the entrance doors and screen plus a minimum of 1500mm deep. No matwell to redundant entrance screen.

3.9 Ceiling Finishes

Warehouse area ceiling finishes shall be the self-finished soffit of the internal liner sheet.

Office
Ceiling finishes generally to office and associated areas shall be a lay-in suspended ceiling system comprising a 600 mm x 600 mm, tegular edge Armstrong Dune Plus self finish mineral fibre ceiling tile with exposed, mitred joint grid system, Armstrong 'Microlook' or equivalent quality.

A 25\50 mm shadow edged trim painted in with wall finish shall be included to all office/circulation areas.

Ceiling tiles in Toilet or shower areas shall be a lay-in suspended ceiling system comprising a 600 mm x 600 mm, tegular edge Armstrong Dune Supreme, self finish mineral fibre ceiling tile with exposed, mitred joint grid system, Armstrong “Microlook” or equivalent quality.

A consistent level ceiling, without steps or bulkheads, shall be provided throughout the office and ancillary areas.

Cavity barriers to ceiling voids shall be provided as required by Building Control.

3.10 Fittings

Within all toilets the following fittings shall be provided:

- 750 x 400 mm mirrors above each wash hand basins.
- Indicator bolt to doors.
- Toilet roll holders and coat hooks etc.
- All disabled fittings, grab rails, etc to any Disabled/ Ambulent toilets.

Any exposed supply pipework to wc or basin to be painted.

3.11 Fire Precautions

The requirements of the Building Control Officer will be incorporated, as indicated on the drawings, in respect of means of escape, fire resisting doors and partitions, fire exit doors and fittings and all associated signs and notices.

Signs and notices will comply with Associated Signs and BS 5499: 2000 ‘Fire Safety Signs, Notices and Graphic Symbols’.

Any other requirements or recommendations of the Local Authority Building Control Department, incorporating the Fire Prevention Officer with regard to provision of hose reels, sprinkler systems, heat sensors, smoke ventilators, extinguishers and other fire fighting equipment are specifically excluded.

3.12 Sanitary Appliances

All the toilet areas shall have Armitage Shanks or equivalent quality white vitreous china sanitary ware, subject to the Employer's right of rejection.

Armitage Shanks ‘Back to Wall’ WC’s suites or equivalent quality, subject to the Employer's right of rejection shall be provided with plastic seat and cover and dual flush plastic cistern located behind plastic laminated covered boxing and shall be complete with overflow indication, cisterns shall be 6/3 litre dual flushing. Cisterns and supplies to include cistermisers.

Wash basins to toilets shall be 585 mm x 420 mm Armitage Shanks basins or equivalent quality, subject to the Employer's right of rejection with push taps with aerated outlets. Captive basin wastes to be utilised.

Exposed service pipework shall be painted.

A toilet compartment shall be provided for the use of disabled persons, all in accordance with the Building Regulations (DocM). The disabled alarm shall be provided adjacent to the toilet and will be visual and audible.

3.13 Lift Installation

No lift installation to be included. Space is to be allowed for 4 person lift for any future tenant installation. This is to include any trimming steelwork and removable floor sections.

3.14 Curtain Walling, Windows and External Doors

Any curtain walling and glazing system shown to the elevations will be aluminium and will be Schuco, unless otherwise approved, fully thermally broken system comprising polyester powder coated aluminium mullions and transoms complete with factory sealed double glazed units with glazed and insulated spandrel panels, where necessary.

Glazing will be in 6 mm Antisun or body tinted glass (colour to be agreed) on clear glass outer pane or similar approved, 16 mm argon filled space and 6 mm ‘low e’ clear inner pane.

Spandrel panels, where necessary, will be in ultra-warm Permawall or similar, insulated panels.

All windows to be in compliance with the CDM Regulations relating to access for cleaning and maintenance of windows and curtain walling all in accordance with British Standards recommendations.

The front entrance and all external doors and frames will be manufactured in Schuco unless otherwise approved, polyester powder colour coated aluminium sections with concealed overhead door closers. All doors will be glazed to the recommendation of BS 952 and BS CP 6262 in laminated or safety glass to match windows and curtain walling.

Front entrance doors are to be self-closing and will incorporate top and bottom deadlock facilities, and where required by part M of Building Regulations, fitted with power assistance opening. The doors will be provided with full height brushed stainless steel door handles to both sides of door leaf.

A letter plate is to be provided in or adjacent to the main entrance doors**.**

No glazing transom shall be designed within a vision zone at 1200mm to 1700mm AFFL.

Three sets of all keys to external doors shall be provided.

4.00 MECHANICAL AND ELECTRICAL SERVICES

4.1 Mechanical Services

Installation to the satisfaction of the Employer. Contractor to provide fully detailed design information including provision of all calculations and working construction drawings for comment.

The mechanical services shall be designed and installed fully in accordance with all relevant and current CIBSE guidance documentation, current British Standards and Codes of Practice, current Building Regulation and Building Control Officer's requirements, Clean Air Act, Gas Safety Regulations, Local Water Board requirements and Health and Safety at Work Act.

4.2 Heating, Cooling and Ventilation Installations

Office to be provided with cooling and heating.

The warehouse element of the building shall assumed to be unheated for the purpose of undertaking the Building Regulations Part L compliance calculations and is only applicable for the As Built Base Build SBEM.

Heating and cooling to the office shall be provided by VRV/VRF systems manufactured and supplied by Mitsubishi Electric or Daikin.

Contractor to provide fresh air to suit BREEAM and relevant regulations.

Indoor units shall be of the above ceiling ducted unit type, the ratio of indoor to outdoor units will provide 100% diversity in the design.

Control of each indoor unit shall be by means of return air temperature sensors located within the occupied space or in the return air grilles.

Gravity condensate drains shall be installed for each indoor unit.

The necessary condensing units shall be located externally. All external refrigeration pipework shall be insulated with Class O grade insulation, which shall be painted with an anti-UV paint (such as Armafinish99) and provided with physical protection from galvanised cable tray inverted over the main pipe support tray to prevent attack from vermin.

Electrical power is to be provided by the electrical sub-contractor to isolators adjacent to each condensing unit.

Supply Ductwork from the Fan Coil units shall be thermally insulated and incorporate a vapour barrier. These ducts shall connect to 4 way louvre faced Supply Diffusers complete with Volume Control dampers and plenum boxes.

Return air is to return to the Fan Coil unit via either Air Handling Light fittings or similar diffusers to those used for the supply system.

Pipework installation shall be provided with Installer and extended warranties provided by the installer/manufacturer.

Design includes allowance of 0.25 kN/ms for office ceiling and services including installations where fitted by tenant.

Within corridors, stairs, utility areas and WCs provide and fit thermostatically controlled wall mounted electric panel heaters.

Provide, install and commission extract systems to the toilets in full compliance with Building Regulations requirements.

Provide and install all volume control devices and smoke and fire dampers. Mode 1' operation fire dampers shall be provided in any locations where ductwork penetrates a fire barrier

Provide and install any and all grilles, diffusers and louvres.

Provide and install all thermal insulation equipment to all supply any air connections and any associated heat recovery return sections.

Provide and install all ductwork installations including all secondary steelwork support.

Where required supply and fit suitably sized weather louvres for the intake and any extract connections to the heat recovery systems including the fitting of these onto the external elevation of the building.

4.3 Design Conditions

The following design parameters shall be employed in the carrying out of all design works:

External

Winter	-5^0C minimum

Internal

Office	21^0C ± 2^0C control band
Toilets	19^0C minimum
Stairs	18^0C minimum
Frost	12^0C

Occupancy

Office	1 person/10m^2

Ventilation

Office	10L/S/person
Toilets	To Building Regulations Part F

Noise Criteria

Office	NR38
Toilets	NR38
Plant Room (where applicable)	NR50

4.4 Domestic Water Services

A mains cold water service will be extended from the intake point of the office to serve all sanitary appliances and any kitchenette/ tea point area.

The plumbing system including hot and cold feeds to all sanitary ware shall be provided using copper service pipe to BS EN 12449:2012 with capillary fittings and all the appropriate bends, elbows tee connections, drains, cocks and stop valves. Where possible all major runs of pipe work shall be concealed, with access through suspended ceilings, raised floors etc. No flexible hoses are to be used for any form of connection.

Hot water to toilet areas shall be by electric heaters, with 3kW heating elements and a minimum 10 litres storage.

The installation shall comply fully with the requirements and recommendations of the Chartered Institute of Building Services Engineers (CIBSE) and the Water Supply (Water Fittings) Regulations 1999.

All hot water service heating shall be to standards advised by CIBSE technical memorandum TM13 against legionella pneumophilia.

All pipe work in floor and roof spaces and ducts and any tanks and cisterns shall be fully insulated to class ‘0’ standards relating to the spread of flame, so as to avoid frost damage. Pipe ductwork shall incorporate adequate access panels. Insulation and boxing in shall be provided to all soil and vent pipes and stacks etc in or passing through the building.

Pipe runs shall be clearly marked. Stop taps and maintenance valves shall be clearly labelled indicating the service effected.

All water services shall be disinfected in accordance with BS6700 and HSG (70) immediately prior to hand over.

All outlets will be directly mains fed with all control devices, including back syphonage, as required to comply with water regulations.

Distribution pipework will be extended to serve all draw off points in the toilets, all pipework within voids will be thermally insulated to BS 5422. Where pipework is exposed within fully tiled toilet areas it will have a painted finish with matching fittings and brackets.

The complete system shall be sterilised and tested as required by BS EN806-2:2005.

A single external watering point will be provided per building (1 for units 2 and 4), comprising a WRC approved outlet complete with hose union tap for a Class 4 water source. The supply shall be taken from the metered Landlord supply and shall be compliant with the relevant water byelaws. To comply with water regulations the supply will be provided with an isolation point. To be adequately protected from frost and from vehicle impact.

4.5 Controls

Any VRV/F and Ventilation system shall be fully controlled from a proprietary VRV/F control system, supplied by the system manufacturer. Each defined zone (each floor) shall be provided with the ability to be controlled as a separate zone, with independent temperature controls in each zone. Each indoor VRF/V unit will have its own wall mounted controller for local independent control of each unit.

Metering is to be provided on every main distribution board and sub-section of distribution board and any circuit supplying equipment with a load of 1kW or more. The metering is to be networked on an M-BUS system, with data collection, analysis and targeting provided through the user interface for complete energy management.

4.6 Testing and Commissioning

All services will be tested and commissioned in accordance with CIBSE technical memoranda, guides and commissioning codes. Services shall be left fully operational.

Prior to Practical Completion a draft copy of the Operational Maintenance Manual to be issued for comment as detailed in Section 1 of this document.

As detailed in Section 1 of this document, following Practical Completion, complete operating and maintenance manuals including the Health and Safety File will be provided incorporating “as installed” drawings, test and commissioning certificates, manufacturer’s literature and emergency telephone numbers.

4.7 Health and Safety Files / Operating and Maintenance Manuals

The Health and Safety Files / Operating and Maintenance Manuals are to be in the format as detailed within the Employers Requirements.

A draft copy is to be made available prior to Practical Completion as detailed in Section 1 of this document. Electronic versions of the file are also to be provided to follow the same format as the hard copies following Practical Completion.

The Contractor shall nominate a suitable person to monitor the commissioning on behalf of the client in accordance with BSRIA and CIBSE Regulations.

5.0 ELECTRICAL SERVICES

5.1 Testing and Commissioning

The electrical services work will be designed and installed in compliance and the recommendations of the 17th Edition of the IEE Wiring Regulations plus amendments, current relevant British Standards and Codes of Practice, Building Control Officers' requirements, the Electricity Supply Regulations and Health and Safety at Work Act.

Contractor to provide fully detailed design information including provision of all calculations and working construction drawings for comment.

5.2 Electricity Supply

The HV cabling, transformer, LV cabling and switchgear up to the metering point, inside the warehouse, will be adopted by an appropriate (i)DNO. The capacity to be:

Unit 2 100kVa
Unit 3 200kVa with additional spare duct.

The Main Contractor shall be responsible for arranging all supply contracts and managing all wayleave agreements.

5.3 LV Panel and Distribution Boards

The LV panel and distribution boards will be in accordance with BS 5486: Part 1, Form 4 –a separation Type 3, suitable for the supply capacity and be complete with necessary MCCB's and MCB's together with 4 spare 3 phase [100A] ways or 50% allowance whichever is the greater. Space to be left in panel for future provision of up to 100% additional spare ways.

Any ancillary area distribution boards shall be in accordance with BS 5486 and be complete with necessary MCCB's and MCB's together with 50% allowance for spare ways.

5.4 Sub Main Cables and Cables

Sub main cables will be provided from the LV panel board to sub distribution boards and busbar trunking feed points, extended in XLPE/SWA/LSF copper cables to BS 5467. All distribution systems will be continually rated and designed in accordance with BS 7671 Requirements for Wiring Regulations.

Sub main cables will be supported on proprietary ladder rack and/or hot dipped galvanised steel medium return flange tray all secured on purpose made Unistrut metal brackets at intervals not more than two metres. All cables will be evenly spaced and securely clipped to the cable tray and identified where necessary with cable markers. All designed as "Spaced" in line with BS 7671.

5.5 System of Wiring

The lighting and power installation to any ancillary areas will, in general, be carried out in LSF/LSF insulated cable run within ceiling voids and where necessary into galvanised steel trunking/conduit to provide a rewireable system that is concealed and flush with plug in roses at termination points for final connection to fittings.

External lighting supplies will be extended in XLPE/SWA/LSF cables run in ducts as necessary.

To the warehouse area the power installations serving the dock doors will generally be carried out with XLPE/SWA/LSF cables to distribution boards.

5.6 Lighting Installations

The lighting will comprise the following (and should be sourced from a single manufacturer such as Thorn or similar):

Office General	600 mm x 600 mm square LED recessed high frequency lay-in modular luminaries with low brightness diffusers in compliance with LG7 to give an average of 450 lux at 850 mm above floor
Toilets and Ancillary	Compact LED recessed downlights with IP44 rating minimum to give an average illumination level of 150 lux at floor level, LED spotlights to mirrors;
Reception/Main Entrance	Uplighter/ downlighter type feature lighting to give an enhanced effect. Generally to give an average luminance of 300 lux;
Lighting Control	All internal lighting shall be controlled by manual on/off switching with PIR absence detection, with a maximum of 6 fitting /PIR. Daylight dimming override shall be provided to the main office consisting of perimeter zones to the windows 4m deep by 6m long maximum with adjustable level sensing to provide dimming to 10% of maximum.

A minimum of 55 lumens / circuit watt throughout the internal installation.

Emergency Lighting	Self contained non-maintenance three hour emergency luminaries to all fire exits, corridors, toilets, staircases both internal and external, reception and to any other areas all in accordance with Fire Officers' requirements BS EN 1838 and BS 5266: Part 1 and 2.22 emergency lighting will be integrated into the main lighting fittings. All emergency lighting will be provided with test key switches adjacent to distribution boards. Scheme to include provision for Emergency exit directional fittings above escape routes to building regulation/ fire officer requirements.
External Lighting	Distribution, layout and type subject to Planning constraints and as ESC Ltd drawing 1383-ESC-00-ZZ-DR-E-2100-P5. LED Floods, Holophane or similar approved to building periphery and on columns to provide levels as approved by Local Planning Authority to service yard as per BS EN

13201 – 2:2003, Table 2 Class CE1. For local lighting above loading bays LED floodlights, with zero tilt mounted flat to ground or similar approved. Car Parking and Road Areas from 6 – 8 metre high columns to provide an average of 15 lux with a minimum of 5 lux at kerb lines all controlled by photocells/ timeswitch located in the entrance lobby. Local increase to 50 lux at the staff entrances and loading bay area.

A minimum efficiency of 50 lamp lumens/circuit watt will be achieved to access way and pathway lighting. Flood lighting shall achieve a minimum 70 lamp lumens / circuit watt.

All lamp columns adjacent to service yards/ access roads to be set back from kerbs. All lamp columns in car parks to be located in landscaped areas or alternatively protected by a barrier system.

5.7 Power Installations

Electrical power supplies will be provided generally as follows:

Mechanical Service	All power and control supplies associated with mechanical services comprising VRF/VRV and ventilation systems and water heaters, etc. Local isolation to be provided to all items of equipment; Water heaters are to be on 7 day, 14 event digital timeclocks positioned adjacent to the relevant distribution board and with permanent display of instructions adjacent on how to operate the timeclock.
BT	1 no 13 amp SP spur for incoming BT supply. This supply together with earth to a dedicated feed from main LV panel;
Main Office Area	Power will be extended to Distribution Boards serving each office floor at ground and first floor levels. Where Raised Access floors (RAF) provided. Recessed floor boxes at the rate of 1/10m² shall be provided throughout the office area including 2no. DSSO's and 4 back boxes for RJ45 outlets All floor boxes to receive electrical cabling and power to be tested at completion. All telephone and data cabling to be installed by future occupier.

	Cleaner's sockets shall be provided such that all areas can be accessed by cleaning equipment with 5m leads.
Stairways	1 no single switched socket outlet at ground and first floors;
Reception / Lobby Area	1 recessed floor box and mid height twin power outlet and data outlet for digital display (All positions to be agreed with the Employer);
Toilets	Fused connection units are to be provided for hand driers (by others) in each toilet area. 1 no alarm pull cord and sounder to each disabled toilet;
Other Office / Ancillary	1 no twin switched socket outlet per 10 lineal metres wall girth (minimum 1 no per room/area);
Warehouse doors	TP & N supplies to doors; All supplies are to be from a separate distribution board located adjacent to the doors.

5.8 Fire Alarm

A new fire alarm system utilising an open protocol analogue addressable system shall be installed with the panel in the main reception area. The system shall be installed to BS 5839 cat L3 using soft skin fire retardant cables installed on cable trays in the ceiling voids and protected in steel conduit in the fabric of the building. Steel ties shall be used throughout. The system shall be designed to allow for additional capacity for the Cat B installation throughout the development.

5.9 Lightning Protection

A lightning protection system will be provided to the building in accordance with BS EN 62305. Full system to be retested 12 months after Practical Completion by the Contractor and any necessary remedial works undertaken.

Surge protection to be provided to the main electrical panel.

5.10 Metering

Sub meters shall be provided as per the building regulations and to achieve the stated BREEAM standard.

Metering is to be provided on every main distribution board and sub-section of distribution board and any circuit supplying equipment with a load of 1kW or more. The metering is to be networked on an M-BUS system, with data collection, analysis and targeting provided through the user interface for complete energy management.

5.11 Bonding and Earthing

All necessary bonding and earthing in compliance with the requirements of the current Edition of the IEE Wiring Regulations will be provided with particular note to incoming gas and water services.

5.12 Testing and Commissioning

The complete electrical installations will be tested and commissioned to give correct working. A Completion Certificate in conformance with NICEIC, record drawings, protective device charts and details of installed plant and equipment will be incorporated into an Operating and Maintenance Manual.

The Contractor shall nominate a suitable person to monitor the commissioning on behalf of the client in accordance with BSRIA and IEE Regulations.

A draft copy will be provided as detailed in Section 1 of this document prior to Practical Completion which also details the copies required at Practical Completion.

5.13 Health and Safety Files / Operating and Maintenance Manuals

The Health and Safety Files / Operating and Maintenance Manuals are to be in the format as detailed within the Employers Requirements.

A draft copy will be provided as detailed in Section 1 of this document prior to Practical Completion which also details the copies required at Practical Completion. Electronic versions of the file is also to be provided to follow the same format as the hard copies.

6.0 EXTERNAL WORKS

6.1 Service Yard Area and Access Road

The Contractor shall provide a design that will accept 44T HGV loading and movement to service yard and access roads.

The service yard and associated access areas shall be excavated to the required formation level, trimmed and compacted with a layer of hardcore to the engineer's details blinded with fine chippings or clinker ash.

Sand or rock sand shall not be acceptable material for finishing the hardcore layer.

Where the slabs are constructed in phases, the compacted hardcore layer must be constructed at least 1m beyond the relevant shutter lines to ensure that infill bays can be adequately compacted and finished.

The surface tolerances to the sub-base layer shall be +5 mm or -30 mm.

A minimum 190 mm thick bed of concrete shall be laid on 1200 gauge polythene or equivalent quality, subject to the Employer's right of rejection using an entrained concrete with a minimum cube strength of 35N/mm^2 at 28 days, reinforced with one layer of structural fabric to the engineer’s details.

Bay sizes and all longitudinal, contraction, induced, expansion and isolation joints shall be formed in accordance with the recommendations of the structural engineer. The slabs shall be laid to maximum falls of 1:30 (except for level access ramps) and minimum falls of 1:80 with the gradients generally sloping away from the building.

The surface of the concrete shall be finished using a serrated float or wire brush, to provide grooves across to the slope of the pavement, with 100 mm trowelled margins adjacent to the shutters.

The surface tolerance for the concrete pavement shall be ± 10 mm on the designed levels and with a max 10mm gap under 2m straight edge.

As soon as excess moisture has evaporated from the surface of the concrete a resin curing compound shall be sprayed uniformly over the still plastic concrete. During hot sunny periods a curing compound containing a suspension of fine particles of aluminium or other white pigment shall be used.

During adverse weather conditions including hot sunny periods, winds in excess of 10 mph and rain, the slabs shall be protected with suitable tents of polythene or equivalent quality, subject to the Employer's right of rejection, in addition to the curing compound.

All concrete work generally shall be in accordance with BS EN 206:2013 +A1:2016 Concrete: Specification, Performance, Production and Conformity and BS 8500:2015 +A1:2016 and the Highways Agency Manual of Contract Documents “Specification for Highway Work” and the Concrete Society publication TR34.

Steel bollard protection shall be provided externally to the warehouse level access doors. Bollards shall be galvanised mild steel sleeved to facilitated easy replacement complete with painted finish.

Drainage channels with steel gratings shall not be used in areas of the service yard where they can be trafficked by turning vehicles.

6.2 Car Parks

i. 80mm thick coloured concrete block paving to circulation areas (where not subject to access by articulated vehicles), with the sub-base designed by the Structural Engineer. Block paviours shall be well mixed before laying. Patches and damaged blocks are unacceptable and shall be rejected.

   All block paviours shall be to BS EN1338: 2003. All block paving shall be laid in accordance with BS 7533-3:2005 +A1:2009 and manufacturer's recommendations.

ii. Macadam surfacing to parking bays, where indicated, shall be designed by the Structural Engineer.

iii. White lines to car parking areas shall be one coat marking paint to a total width of 75 mm.

iv. Car parking spaces shall be of a size of 2.5m x 5m minimum or to suit local authority requirements and the road width between bays shall be 6.0m minimum. Disabled parking bays shall meet Local Authority requirements.

6.3 Kerbs

Kerbs where indicated shall be 254 mm x 127 mm half battered precast concrete kerbs to BS EN1340.2003 bedded onto a 325 mm x 150 mm concrete base and haunches with concrete shall be laid.

6.4 Footpaths and other access

Footpaths shall be excavated to formation level trimmed, compacted and provided with 100 mm minimum thick stone hardcore base blinded with a fine stone sand or clinker ash and finishes:

i. 200 x 50mm coloured concrete block paving in Herringbone pattern to paths around the entrance area. 50 mm thick charcoal coloured concrete block paving to circulation areas. (Where not subject to access by articulated vehicles. Block paviours shall be well mixed before laying. Patches and damaged blocks are unacceptable and shall be rejected.

ii. All block paviours shall be to BS EN1338: 2003. All block paving shall be laid in accordance with BS 7533-3: 2005 +A1:2009 and manufacturers recommendations.

iii. Access shall be provided for window cleaning equipment.

iv. A 300 mm gravel margin with a 125 mm precast concrete edging section shall be provided to all elevations of the warehouse with adjacent landscaped or seeded areas.

v. Building perimeter footpaths to be in concrete to Engineer's details.

6.5 Landscaping

The landscaping scheme submitted as part of the Planning Application, is to be completed during the construction programme, to Local Authority and Landscape Architect's satisfaction.

The tendering Main Contractor shall obtain a quotation for the soft landscape element of the contract from Whiting Landscape, which will form part of the tender submission. The quotation shall include for design, ground cultivation, compost, tree / thicket / hedge / shrub / aquatic / bulb planting, turfing, grass / wild flora seeding, rabbit protection, forest bark mulch, tree surgery and twelve months maintenance (plus any other special requirements). The scheme prepared must be suitable to obtain approval from the Planning Authority.

The landscaping Contractor shall include for 12 months maintenance and provide a maintenance schedule of planned visits for Practical Completion.

Due to the seasonal nature of plant material, planting works must be undertaken during an appropriate time of year, as set out below, and Landscape Contractor must agree their programme with the Main Contractor at the time of tender or before appointment. In the absence of any notification on the limitations on the intended programme, it will be assumed the Landscape Contractor has the resources and made appropriate provisions for obtaining suitable plant stock to facilitate out-of-season planting to suit the overall project completion date. Refer to the Main Contractor for confirmation of the project completion date.

Type of Planting	Season
Bare Root Transplants	November - End of March
Root Balled Trees	November - End of March
Spring Ringed or Container Grown Trees	Year Round
Container Grown Shrubs / Ground Cover	Year Round
Grass turf	October – End of April
Grass Seed	September/October and March/April
Marginal Aquatic plants	October – End of April

6.6 Fencing

There is no fencing to any of the perimeter of Units 2 and 3. The site is secured with gates and fencing to the main entrance and along Nursery Lane.

6.7 Drainage

i. General connections from the site boundary to main foul and surface water sewers shall be made in accordance with the requirements of the Local Authority.

An overland flow route is to be provided to ensure excess surface water is routed around buildings, away from all entrances.

The drainage system generally shall be in accordance with:

BS EN 13476 and WIS 4-35-01 Structured wall thermoplastic pipes

BS EN 295-1:2013 Specified for vitrified clay pipes, fittings and joints.

Building Regulations approved document H – Drainage and water disposal.

BS EN 12056:2000 Gravity drainage systems inside buildings

BS EN 752:2008 Drains and sewer systems outside buildings

ii. Pipework

Any adoptable foul and storm drainage shall be constructed in accordance with the requirements of Sewers for Adoption 7th Edition and the Adopting Authorities requirements. All private drainage is to be constructed in accordance with the Building Regulations as current at construction and as shown on the drainage drawings.

Adoptable pipework to be clayware or concrete. All private pipework to be clayware, plastic or concrete; clayware to BS EN 295-1, precast concrete to be L, M or H to BS 5911. Plastics to be BSI kitemarked, Agrement certified or both. PVC-U solid wall systems to be to BS EN 1401 with fittings to BS 4660 or BS EN 13598-1. Structured wall pipes in PVC-U, PE or PP to be to BS EN 13476-1 and either -2 or -3. All systems to be installed in accordance with manufacturer's recommendations and with appropriate bed and surround. All pipe systems must have appropriate levels of ring stiffness – typically 8kN/m^2 and jetting pressure resistance of 2600psi without damage as per the "Sewer Jetting Code of Practice 2nd Edition (2005-2006)" Table 5.2. Additional concrete protection must be provided where side support may be lost in the future due to parallel trench excavation e.g. for services or drain repair / replacement. Drainage pipework internally to the building area shall have a concrete and surround.

Where required, pipework shall be protected in accordance with "Simplified Tables of External Loads on Buried Pipelines".
All necessary bends, junctions and other fittings required to complete the work shall be provided. Flexible joint covers shall be provided to drainage pipework when leaving the building areas.

iii. Manholes and Inspection Chambers

Manholes shall be constructed to the depths required using either precast concrete rings and heavy duty cover slabs or in semi-engineering brickwork. The bases of the manholes shall incorporate all necessary clayware channels and junction fittings and shall be benched in fine granolithic concrete. Inspection chambers can be UPVC units with appropriate surround to suit location.

Galvanised step irons shall be provided in the walls of manholes. Chamber covers shall be galvanised steel or cast iron of an appropriate load bearing capacity.
Chamber covers shall be square to the building and positioned to avoid entrance and service doors.

Manhole covers, gullies and drainage channel covers shall be painted black prior to practical completion.

iv. Main Sewer Connection/ Foul storage

Make connections to existing foul and storm water drainage systems including complying with all drainage authority requirements.

Foul storage/ treatment warning. Shall be provided with high level warning system i.e. flashing beacon. Electrical supply to be taken from Landlord supply. Warning indicator to be located above any sewage treatment facility.

Allow for 1no foul pop up connection to Unit 2. 2no foul pop up to Unit 3, one to be spare.

v. Gullies

Gullies to access roads, service yards and car parking areas shall generally be precast concrete or polypropylene road gullies, 150mm outlet, trapped with rodding eye to BS 5911-6:2004 fitted with heavy duty cast iron gully grate and frame to BS EN 124. Linear channel drains to service yards and car parking areas shall generally be galvanised steel sections or polymer concrete units with trapped outlets, ductile iron gratings or appropriate style and load class to suit locations.

vi. Petrol Interceptors

Petrol/ oil interceptors as required for pollution prevention shall be installed and ventilated to serve the storm water drainage system to external paved areas and access roads. Interceptors shall be provided with high level warning system i.e. alarm. Alarm housing to be located in main building entrance lobby where applicable.

vii. CCTV Survey

Upon completion of the drains but after cleaning, a CCTV survey shall be carried out on all below ground drainage and a copy of the video included within the Health and Safety File and a copy handed to the Employers Agent before Practical Completion.

6.8 Ramps

Where ramps are required shall be provided for access into the building for disabled persons or for trolley access, these shall be a maximum rate of 1 in 12, complete with handrails as applicable.

6.9 Retaining Walls

Retaining walls shall be provided as required.

6.10 Cycle Shelter

Provide and fix Broxap Sheffield style and hoops, or equivalent, numbers as required to suit planning approval and BREEAM requirements.

6.11 External Services Generally

The Mechanical and Electrical Contractor shall carry out all necessary calculations and liaison with Utility Authorities and Shippers in order to obtain necessary supplies for the continuation of the works and the subsequent operation of the entire premises.
Meters shall be ordered by the Main Contractor.

All meters shall be capable of being monitored by a future BMS system.

6.12 Electric Supply

An incoming electric service of to suit the completed demand is to be provided to the building.

An incoming service duct shall be provided for the Local Electricity Board to lay in a HV supply to a ring main unit. Located at the boundary with HV metering.

The electrical Contractor shall provide a suitable transformer, earth mat and LV cables, with suitable cable ducts/ routes to the building switch room location.

Lighting and small power services to be installed to the substation and switch room, with frost protection. The lighting to achieve 250 lux and emergency to 1 lux.

6.13 Water Supply

A metered domestic water supply will be provided from the site boundary/public supply to serve the building. A nominal 35mm supply to be provided.

A dedicated client pulse meter will be provided capable of being monitored from a BMS, the meter shall be complete with high flow and duration alarms to an alarm panel located at reception.

Unit 3 to be provided with additional capped water supply.

Fire hydrants to be provided in accordance with the requirements of the Local Authority.

A 100mm nominal bore water unmetered supply shall be provided for future use by occupiers if a sprinkler installation is required.

6.14 External Ducts

To all units. Duplicate additional spare ducts to be provided to Unit 3.

2 ducts not less than 90mmØ will be provided from the site boundary to a designated intake point to serve the communications requirements of BT. 2 no additional duct systems shall be provided for use by others.

2 no vacant ducts not less than 75mmØ will be provided from each of the corners of the building to external locations within the soft landscaping to suit the required wire ways of a possible future CCTV installation and external signage provision.

All ducts will be left clear with draw cords.

INDUSTRIAL UNIT, HANDCROSS,

6.15 Attenuation

Surface water attenuation shall be provided to suit the Flood Risk Assessment and the system outside of the site demise provided by the Site Infrastructure developer.

INDUSTRIAL UNIT, HANDCROSS,

APPENDIX A

HTC

Drawing no.		Revision	Description
2125	C110	E	Phase 1 Units 2 and 3 Ground and First Floor Plans
2125	C115	B	Phase 1 Units 2 and 3 Roof Plan
2125	C210	D	Phase 1 Units 2 and 3 Elevations
2125	CSK15	C	Phase 1 Units 2 and 3 Ground Floor Plan Sub Division sketch

ESC

Drawing no.		Revision	Description
1383	ESC-00-ZZ-DR-E-2100	P5	External Lighting Layout