2.2.8 As Built Specification

P21-024 Calder Park, Wakefield

Post Completion Base Build Specification

NEW 330,100ft^2 Warehouse Unit

INDUSTRIAL UNIT
CALDER PARK, WAKEFIELD

SCHEME REQUIREMENTS FOR BASE BUILD WORKS

1.00 GENERAL

1.1 Location

The site is situated at Calder Park, Wakefield as identified on HTC Architects site location plan drawing reference 2479 Contract 04.

1.2 Description of Development

The development comprises the design and construction of a single storey warehouse, with a clear height to underside of haunch of 18 metres; with offices, together with associated car parking, service yards, drainage, landscaping and incoming services.

1.3 Area Requirements

The minimum Gross internal floor areas of the building shall be as set out below:

	Sqft
Warehouse	303,000
1st Floor Office	8,000
2nd Floor Office	8,000
3rd Floor Office	8,000
Ground Floor Yard Office	1,550
1st Floor Control Yard Office	1,550
Gatehouse	210
TOTAL GROSS INTERNAL AREA	**303,310**

Note the 3rd floor is constructed as Shell only, i.e. floors lift core and stairs, with external walls left to sheet rails.

1.4 Drawings

The drawings have been issued to the client as part of the O&M package, have been prepared by:

HTC Architects
PRP Consulting Engineers
All design subcontractors

Contractor has provided fully detailed design information including provision of all calculations and working construction drawings including any Mechanical and Electrical design information.

1.5 Building Heights

Production / Warehouse Area - Minimum clear height to underside of haunch shall is not less than 18 metres.

Office / Ancillary Areas – Minimum floor to ceiling heights on both ground floor and first floor is no less than 2.7 metres to office areas and 2.4m to all toilets (including ancillary lobbies), and stores.

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, aluminium windows and doors to ground and first floor offices and with coloured service doors, entry doors and personnel doors. Types and colours of all external materials have been approved by the Planning Authority.

1.7 Design & 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 achieved the client's requirement for an EPC rating of 'A' with relevant iSBEM calculations.

The design has complied 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 have been subject to thermal modelling and verification by SBEM calculation.

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 have 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 materials, an embodied energy assessment is required to investigate the possibility of increasing the carbon sequestration potential of the project and wherever possible utilise recycled components, recycled aggregate and use local suppliers.

1.9 Deleterious Materials

Winvic have 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 have provided electronic **interactive** copies of the information required by the Principal Designer to compile the Health & Safety File for the Project. The information has been agreed with the Principal Designer and 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, firefighting 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.

1.11 Operation & Maintenance Manuals

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

1.12 Building Log Book

The Building Log Book shall be provided in accordance with Building Regulations and to CIBSE TM31 Guidance incorporating all requirements of the BREEAM assessment.

1.13 Spares

As a minimum one box 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 are positioned to allow safe access for servicing staff.

All plant installed have been 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
- 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 end user's insurance company which are an enhancement of the statutory technical standards
- Materials handling equipment

- Firefighting 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
- 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
- For clarity the Ground Floor of the offices will be a core area and undercroft only.
- There are no allowances for fit out of the 3rd floor offices these are to be left as shell only i.e. floor slab (no raised access or finishes) no M&E first or second fix, no finishes. Walls are to be left as the shell purlins. Lift core and stairs are to be taken up to third floor. For clarity M&E plant will be sized suitably to ensure fit out of offices by a future occupier.
- Fire hydrant is to be provided within the estate road suitable for building control purposes and the use of this building. Should a hydrant be required this is deemed additional.

2.00 WAREHOUSE BUILDING ENVELOPE

2.1 Geotechnical Report

Ground investigation report reports have been prepared by PRP Consulting. This report is included within the Employer's Requirements document.

The Contractor must satisfy himself as to the adequacy of this investigation and report and may carry out any further investigations to establish the detailed sub-structure and foundation design**.**

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

The site was cleared before Winvic took charge of the site.

2.3 Earthworks

The Contractor have allowed for any excavations and ground engineering and clearance required to establish the correct formation level over the area of the building as indicated on the Engineering drawings.

All necessary works have been 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 have been 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 comply with BS 8110:1997 and/or BS EN 1992 – 1-1, the Structural Use of Concrete.

Sub-base material used to a minimum granular type II material to Clause 8.04 of 'Specification for Road and Bridge Works' and to the approval of the Structural Engineer. Recycled aggregates have been utilized where practical, testing of recycled aggregates has been undertaken by an independent monitoring company to ensure compliance with GAC requirements.

All necessary hardcore and filling have been 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 have been 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.

The concrete foundations and ground floor slabs are 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 are based on 35N/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 has been provide the necessary protection against sulphate attack in accordance with BRE digest 363.

The ground floor slab (including office area) has a mesh reinforced concrete slab to specialist design, minimum design thickness 175 mm or as required to satisfy specified performance criteria to specialist subcontract design with a power floated finish will be provided to all ground floor areas within the building. The slab is 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 300mm apart and a minimum distance 150 mm away from floor joints) anywhere on the floor.

Height to Haunch	Rack Leg Load
18m	10 Tonnes

Where joints have been provided in the construction of the floor, they are 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 have be co-ordinated with a client racking layout provided. Day joints should be tied or reinforced with 10mm minimum thickness arris protection e.g. Permaban Alpha Joint or equal approved.

The concrete is in accordance with BS EN206 and have a minimum compressive cube strength of 40N/mm2 at 28 days. The concrete have a minimum cement content of 325kg/m3 of a maximum cement content of 450kg/m3 with a maximum water cement ratio of 0.50. The concrete has been designed to have a maximum slump of 75 mm due to water, the use of super-plasticisers have been permitted to obtain the workability required by the subcontractor for placing the concrete.

Lignite is not permitted for use as an aggregate.

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

The ground floor slab 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.

The ground floor slab wearing surface has a minimum abrasion resistance of AR1 in accordance with BS 8204 part 2 tables 3 & 4 or TR34. One abrasion test is to be carried out for each 2000m^2 of slab or part thereof, in accordance with BS 8204 to confirm that appropriate abrasion resistance has been achieved.

After the final power floating operation, the floor slab has been sprayed with an acrylic based, curing sealing and hardening membrane, with a curing efficiency of 90%. The floor was not 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.

The ground slab is 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 was 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 were fixed to provide protection from wind and rain.

All joints were 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 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 have provided all gas protection measures deemed necessary, with the approval of the Structural Engineer and Building Control.

The ground floor slab was monitored by an independent consultant, Face Consultants. Works were included in the agreement of the design specification, concrete mixes and monitoring of quality on site throughout the pouring process.

For clarity the Ground Floor of the offices include a core area and undercroft.

The office ground floor slab has been designed to take an imposed loading of 10kN/m^2 + 1kN/m2 for partitions with a surface tolerance and finish appropriate to the specified floor finishes.

2.5 Structural Frame

The structural frame provided a clear span portal frame type with a minimum height from finished floor level to the underside of haunch as noted previously. The frame designed so as to span each entire unit, with internal column positions agreed with the Employer prior to placement of order. The roof pitch shall be a minimum pitch of 4 degrees with a curved apex. The design of the structural steel frame in accordance with all British Standards, Building Regulations and National Structural Steelwork Specification.

Bracing CHS and is kept free from open areas / internal stanchions, door, window openings and the like.

The frame installations include all main stanchions, roof beams, purlins, cladding rails and raisings. The frames are capable of supporting a service load of 0.25kN/m^2 (over the whole roof) for mechanical and electrical installations, including 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.

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

All exposed surfaces of steel framework finished in either primer coat or intrumiscent paint system where required.

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

The steelwork designed and constructed to allow the building envelope to achieve compliance to Technical Standards 6.1. All purlins and rails fixed in accordance with manufacturer's recommendations and 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 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 (colour to be agreed with tenant prior to coating). Cold formed sections will be manufactured from hot dipped galvanised coil to BS EN10147: 1992 and BS EN10143: 1993. If the finish becomes damaged, then the complete face is to be re-painted.

2.6 Envelope

'Twin-Therm® Chronus® Ready' Building Envelope Specification.

An independent cladding inspector, Lampos, trained and knowledgeable in the cladding systems specified, were employed by the main contractor to review the onsite installation of the cladding and to provide written reports. The cladding inspection reports were made available to the client

The roof and wall cladding system manufacturer have undertaken all relevant project wind load and snow drift analysis in accordance with BS EN 1991-1-4:2005+A1:2010 for the cladding and confirm all relevant cladding system structural requirements, including external profiled sheet parameters, fixing centres, spacer system and bracket spacings.

The roof and wall cladding system incorporates the Twin-Therm® Chronus® Ready design.

In line with the CA Group Complete Assurance guarantee, periodic inspections of the building envelope will be conducted at regular intervals throughout the guarantee period of the systems, the frequency of which will depend upon the materials and components specified. The building envelope supplier (CA Group) will, as part of its agreement, undertake these inspections on behalf of the developer (Tungsten) and provide comprehensive inspection reports for the guaranteed life of the building, subject to the necessary access being made available.

2.7 Roof

Twin-Therm® Chronus® Ready Roof

The roof the Twin-Therm® Quantum Chronus® Ready roof system utilising nominal 0.7mm thick Colorcoat HPS200 Ultra® coated steel external sheets supported by the Confidex® Guarantee of up to 40 years and fixed as per the system requirements. The roof, inclusive of Therma-light rooflights will be included within the CA Group Complete Assurance Guarantee, which provides a meaningful guarantee for all components within the Twin-Therm® roof and wall assemblies (not just the external coating) for a period of 25 years (rainwater goods maximum 25 years).

The CA 17 1000L liner panel will be minimum 0.4mm thick with the internal finish to be Colorcoat PE15 white to the exposed face of the cladding lining panel.

The roof and wall cladding systems are tested in accordance with LPS 1181 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 BS 476 Part 7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

Therma-quilt glass fibre insulation has been specifically designed and tested in accordance with BS EN 1609:2013 to minimise moisture retention, which is critical when used in buildings with specialised internal environments. Therma-quilt is Euroclass A1 (non-combustible) for reaction to fire when tested and assessed in accordance with BS EN 13501-1:2018 and to achieve a minimum designed thermal U-value of 0.23W/m²K (180mm thick).

The minimum designed roof pitch 4.5° (3.0° after deflection) for pitched roof designs. Where a Twin-Therm® Quantum or Griffon curved roof design is required, the roof system will be designed to ensure the external sheet end laps (including inplane rooflights) are to be minimum 4.0° design (2.5° after deflection) installed as per the system manufacturers recommendations. For project specific design roof pitch, refer to project drawings.

The roof system covered by the relevant independent Agrément Certification, current at date of installation and inclusive of all specification requirements.

Therma-light Quick Release Rooflights

The rooflight assemblies has been triple skinned GRP, with a 2.44kg/lm (CE24) inner and a 1.83kg/lm (CE18E) 'Quick Release' outer skin, with a separate intermediate core and all relevant components to achieve a U-value of 1.30W/m²K. Rooflights will be provided to approximately 10% of the floor area, installed as per the system manufacturer's recommendations.

The internal rooflight lining Class 0 and external rooflight Class 3 rating for surface spread of flame as tested to BS476 Part 7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

The installed roof and rooflight systems has a minimum Class B Non-Fragile for a period of 25 years, tested in accordance with the HSE materials standard ACR[M]001:2019 "Test for Non-Fragility of Profiled Sheeted and Large Element Roofing Assemblies (Sixth Edition)". The system tested for all spans up to a maximum of 1800mm. This only applies to tested roof assemblies where all of the roof components are supplied by the system provider. Annex 'C' from the HSE Document ACR(CP)001:2016 Rev 5 "Recommended Practice for work on Profiled sheeted Roofs" completed and submitted by the Appointed Roofing Contractor as part of the tender package for approval and acceptance by the Architect, Developer and Client.

Detail work to ridge, eaves, hip and verge will be in accordance with the manufacturer's recommendations and standard approved design details.

Fascia and Soffit flashings formed from aluminum. Fixings are designed to enable Fascia and soffit panels to be fixed, without creases or deflection.

On pitched roof designs Cranked Ridge liner panels should be installed. Internal flat ridge flashings are not acceptable.

Service Yard Office Roof

The roof, the River-Therm® secret fix roof system utilising nominal 0.55mm thick Colorcoat HPS200 Ultra coated steel external sheets supported by the Confidex Guarantee of up to 40 years and fixed as per the system requirements. The roof to provide a manufacturer's warranty for the entire installation for a period of 25years (rainwater goods maximum 25years).

The CA 32 1000RL liner panel has a minimum 0.7mm thick with the internal finish to be polyester bright white to the exposed face of the cladding lining panel.

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 rating for surface spread of flame as tested to BS 476-7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

Therma-quilt glass wool insulation to be utilised within the roof construction with a Euroclass 'A1' non-combustible certification for reaction to fire when tested to BS EN 13501-1:2007 +A1:2009 and to achieve a minimum designed thermal U-value of 0.23W/m²K (180mm thick).

The roof system designed to ensure the external sheet is to be minimum 2.5° design (1.0° after deflection) at gutter position and installed as per the system manufacturers recommendations. For project specific design roof radius refer to project drawings.

The roof system covered by the relevant independent Agrément Certification. Horizontal

Life Line System

An appropriate horizontal life line system incorporated to permit safe roof and gutter access for maintenance purposes. The life line system utilised has been tested on the corresponding complete system build-up with all relevant system depths, fixings and sealants adopted in the test.

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) Regulation 2015. 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

Valley and perimeter gutters are to membrane coated galvanised steel gutter system (single skin or insulated depending on location). Boundary and valley gutter material will be a minimum 1.2mm thick nominal pre-galvanised steel, complete with 1.2mm PVC pre-laminated membrane, in accordance with the Metal Gutter Manufacturers Association (MGMA). The gutter system guarantee is up to 25 years. All internal gutters to be factory insulated using rigid 50mm thick rock fibre insulation which is Euroclass 'A1' non-combustible in accordance with BS EN 13501-1.

The water taken from the gutters by a syphonic drainage system.

The drainage system designed and constructed to comply with BS EN 12056- 3:200, BS 8490:2007 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 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 in accordance with any relevant British or European Standards.

The rainwater outlets are distributed evenly along the total gutter length and where practically possible outlets be at the mid bay position of the gutter with quantity and size to suit syphonic design. Discharge locations were agreed with the Client / Architect.

Syphonic pipework firmly attached to an engineered continuous railing system, using appropriate pipe clamps. Securely fastened back to the main structure at a maximum of 2m centres to provide adequate and proper restraint against thermal movement. Additional bracing provided within 100mm of the closest edge of the pipework, end branch connections and where required.

Indicative weir outlets provided to the ends of valley gutters and at 50m intervals on perimeter gutters to provide advance warning of blockage of the syphonic system.

Both primary and secondary systems have been provided. The secondary system discharges onto hard landscaped areas.

All pipework was set above the haunch and downpipes set within the web of the steelwork.

2.8 External Walls

Dock surrounds constructed using Pro wall or other similar precast concrete systems.

Note generally performance and inspections comply with the generic items within the envelope element of this specification.

Twin-Therm® Chronus® Ready Profiled Wall Cladding

The wall cladding the Twin-Therm® Chronus® Ready wall system utilising either Colorcoat HPS200 Ultra® or Colorcoat Prisma® coated steel external sheets (gauge 0.5/0.7mm thick nominal subject to orientation and/or colour) supported by the Confidex® Guarantee of up to 40 years and fixed as per the system requirements. The wall systems have been provided a manufacturer's warranty for the entire installation for a period of 25 years.

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

The CA 17 1000L liner panel will be minimum 0.4mm thick with the internal finish to be Colorcoat PE15 white to the exposed face of the cladding lining panel.

Therma-quilt glass fibre insulation has been specifically designed and tested in accordance with BS EN 1609:2013 to minimise moisture retention, which is critical when used in buildings with specialised internal environments. Therma-quilt is Euroclass A1 (non-combustible) for reaction to fire when tested and assessed in accordance with BS EN 13501-1:2018 and to achieve a minimum designed thermal U-value of 0.35W/m²K (120mm thick).

The wall cladding systems are tested in accordance with LPS 1181 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 BS 476 Part 7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

The wall systems are covered by the relevant independent Agrément Certification.

Twin-Therm® Chronus® Ready Wall Cladding incorporating CA 300 Microrib Profile

The cladding the CA Group Twin-Therm® Chronus® Ready CA 300MR (microrib) Wall system utilising either Colorcoat HPS200 Ultra® or Colorcoat Prisma® coated steel external sheets, 0.7mm thick nominal supported by the Confidex® Guarantee of up to 40 years and fixed as per the system requirements. The wall systems provide a manufacturer's warranty for the entire installation for a period of 25 years.

Colour arrangement and layout of panels to be as agreed with Planning Authority to suit the approved elevational treatment. Refer to drawings for project specific information.

The CA 17 1000L liner panel has a minimum 0.4mm thick with the internal finish to be Colorcoat PE15 white to the exposed face of the cladding lining panel.

Therma-quilt glass fibre insulation has been specifically designed and tested in accordance with BS EN 1609:2013 to minimise moisture retention, which is critical when used in buildings with specialised internal environments. Therma-quilt is Euroclass A1 (non-combustible) for reaction to fire when tested and assessed in accordance with BS EN 13501-1:2018 and to achieve a minimum designed thermal U-value of 0.35W/m²K (120mm thick).

The wall cladding systems are tested in accordance with LPS 1181 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 BS 476 Part 7:1997. In accordance with the latest test standards all liner fillers to be flame retardant.

The wall systems covered by the relevant independent Agrément Certification. Twin-

Therm® FW FireWall Chronus® Ready Cladding

Please refer to project specific information relating to boundary wall conditions and any project specific firewall requirements. Delete as appropriate;

Twin-Therm® Chronus® Ready FW15 FireWall (Therma-quilt glass fibre) / FW120 FireWall (Therma-rock rock fibre) specifically designed and tested in accordance with BS EN 1609:2013 to minimise moisture retention, which is critical when used in buildings with specialised internal environments. Therma-quilt is Euroclass A1 (non-combustible) for reaction to fire when tested and assessed in accordance with BS EN 13501-1:2018 and to achieve a minimum designed thermal U-value of 0.35W/m²K (120mm thick).

Tested in accordance with LPS 1181 to achieve a minimum grade 'EXT-A15' (FW15) / 'EXT-A120' (FW120) certification, certificate reference LPCB 443a. Tested and assessed to BS 476-22: 1987 the FireWall systems provide 240 minutes structural integrity and 15 (FW15) / 120 (FW120) minutes insulation integrity.

The FireWall systems are covered by the relevant independent Agrément Certification.

Airtightness

An air-tightness test was carried out to the whole building by the Main Contractor prior to the Client obtaining access, the timing of this air test must only.

This test conformed to all current legislative requirements and Building Regulations Part Approved Document L2A. The air test should, as a minimum, comply with BS EN 13829:2001 and to be a minimum requirement of 2.0m³/hr.m² @ 50 Pa positive air pressure.

A copy of the resultant report has been provided to Client / Developer.

2.9 External Doors

Doors located as identified on the drawings and 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 comply with Part L2 of the current Building regulations.

Office doors, 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 comply with the appropriate requirements of the insurance company's security requirements. Three sets of all keys to external doors have been provided.

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

Where applicable the external steps to the dock level area are constructed in galvanised steel with a slip resistant finish and contrasting nosing's. Handrails and balustrades provided in circular hollow, hot dipped galvanised mild steel sections. Steel staircases shall be provided with drilled drainage holes to prevent standing water.

2.10 Level Access Doors and Equipment

Doors provided Hormann and approved, to consist of electrically operated insulated vertical lift with beam support low level springs for ease of future maintenance. The rigid panels 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 provided between inner and outer skins. EPDM seals 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. 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 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.

2.11 Dock Access Doors and Equipment

Articulated HGV

Where shown on the drawings, doors as manufactured by Hormann and are electrically operated (with manual over ride facility), vertical lift doors with spring support by door supplier at low level for ease of maintenance and K.A. continuous thermal break is to be provided between inner and outer skins. Size 2860mm wide x 3000mm high (Note structural steel size 3000mm wide x 3070mm high), with neutral acrylic double glazed vision panels as indicated on the drawings. Doors complete with anti-lift automatic locking device.

The doors are of composite construction comprising galvanised steel inner and outer faces with door panels filled with polyurethane foam insulation to achieve an optimum panel 'U' value of 0.4W/m^2K. EPDM seals to be fitted to the top, bottom and sides of the door to prevent rain penetration and minimise draughts. To BS EN 12425 and compliant with current building regulations. Compliance with BS EN 12453: 2001 (requirement for safety in use of power) and BS EN 12604: 2000 (mechanical aspects). Finger trap protection to panel joints inside and out. The surface finish to the external face of the doors will be polyester colour to manufacturer's standard range of colours with internal face RAL 9002.

To each dock access door location will be fitted with a Hormann (2500mm long x 2000mm wide x 650mm deep) hydraulic dock leveller or equal and approved, with 450mm long self-cleaning OPEN HINGE swing lip (not piano hinge) for heavy duty use. Rated capacity 6000kg single axle loading (100% to be calculated on front axle,
e.g. 3000kg on each of the front wheels acting over two 150mm x 150mm contact areas at 1m lateral centre distance) with 8/10mm thick 1-PIECE deck plate, lip and 'reinforcement cross beams manufactured from FE- 510D high tensile steel. Automatically operated galvanised TWIN cross traffic safety support legs supporting the unit without reliance on lip saddles / cradles. Operating range of 300mm above dock and 300mm below dock.

Panic stop facility to prevent free fall in the event of vehicle pull away. Emergency stop. Full range safety toe guards, all fully compliant to EC directive EN1398 and adjustable integral pit frame for suspended type dock levellers in conjunction with pre-cast tail lift arrangement. Deck, lip and front beam Gloss black RAL9011 with sub-frame and integral curb angles hot dipped galvanised finish.

Perimeter brush seals to reduce draughts and interlock safety device to prevent dock leveller from operation when door is in the closed position.

To each dock access door location will be fitted a Hormann heavy duty steel frame collapsible dock shelter or equal and approved, 3400mm wide x 3600mm high x 550mm projection from building line with 3mm thick (3500gm/m^2) PVC front flaps with single white chevron markers, top section of the shelter designed to assist rain water drainage with 100mm sloping roof from back to front.

External 24V DC 100mm dia red and green LED traffic light system with directional on reversing driver's side compliant to BS 873 standard with mimic/repeater lights incorporated into Hormann composite control panel.

For illumination to inside of trailers fitted adjacent to door internal angle poise dock light reference K1080LED with transformer to reduce from 240v supply, bulb to be cool white 6w LED with 60^o lighting array. Angle poised arm to incorporate vertical pivot function.

Below each dock leveller position are fitted with an Energy absorbing Polyethylene low friction dock bumpers (not plain rubber bumpers) incorporating rubber shock absorbers to reduce collision damage. Bumper size; 220mm wide x 520mm high x 140mm projection fitted with special front plate to be manufactured using high molecular polyethylene which can simply be rotated onsite and interchanged to give four times the life of each buffer. All fixing to be located in rear galvanised housing to ensure uninterrupted flat surface, and removable bottom section are to be provided. Based on 150mm deep bumpers a lip projection of 250mm is required for suitable engagement of trailer beds.

Bumper housings are to be bolted to special front mounting plates 220mm wide x 520mm high x 10mm deep welded to dock leveller frame and angled over the front PC retaining wall with pins / tangs for casting into the finished internal dock slab for added strength and edge of dock protection. Plates to be finished Gloss Black RAL9011.

Each dock location is to be operated using single composite control panel model Hormann, incorporating door up / down / e-stop buttons, dock leveller raise push button, red-green mimic lights, power and auto switch Red-Green traffic lights, power and auto switch LED loading light and equipment interlocks.

Below each dock access bolted down into external service yard slab 1-pair of 2000mm long x 170mm dia galvanised tubular steel wheel guides with FLARED entrance for ease of parking.

Hydraulic Double Deck for Euro Container

Where shown on the drawings, doors as manufactured by Hormann and are electrically operated (with manual over ride facility), vertical lift doors with spring support by door supplier at low level for ease of maintenance and K.A. Continuous thermal break is to be provided between inner and outer skins.

Size 2860mm wide x 3000mm high (Note structural steel size 3000mm wide x 3070mm high), with neutral acrylic double glazed vision panels as indicated on the drawings. Doors complete with anti-lift automatic locking device.

The doors are of composite construction comprising galvanised steel inner and outer faces with door panels filled with polyurethane foam insulation to achieve an optimum panel 'U' value of 0.4W/m^2K. EPDM seals to be fitted to the top, bottom and sides of the door to prevent rain penetration and minimise draughts. To BS EN 12425 and compliant with current building regulations. Compliance with BS EN 12453: 2001 (requirement for safety in use of power) and BS EN 12604: 2000 (mechanical aspects). Finger trap protection to panel joints inside and out. The surface finish to the external face of the doors will be polyester colour to manufacturer's standard range of colours with internal face RAL 9002.

To each dock access door location will be fitted a Hormann(4000mm long x 2000mm wide x 715mm deep) or equal and approved, hydraulic dock leveller with 500mm long self-cleaning OPEN HINGE swing lip (not piano hinge) for heavy duty use. Rated capacity 6000kg single axle loading (100% to be calculated on front axle,
e.g. 3000kg on each of the front wheels acting over two 150mm x 150mm contact areas at 1m lateral centre distance) with 8/10mm thick 1-PIECE deck plate, lip and 'reinforcement cross beams manufactured from FE- 510D high tensile steel. Automatically operated galvanised TWIN cross traffic safety support legs supporting the unit without reliance on lip saddles/cradles. Operating range of 415mm above dock and 340mm below dock. Panic stop facility to prevent free fall in the event of vehicle pull away. Emergency stop. Full range safety toe guards, all fully compliant to EC directive EN1398 and adjustable integral pit frame for suspended type dock levellers in conjunction with pre-cast tail lift arrangement. Deck, lip and front beam Gloss black RAL9011 with sub-frame and integral curb angles hot dipped galvanised finish.

Perimeter brush seals to reduce draughts and interlock safety device to prevent dock leveller from operation when door is in the closed position.

To each dock access door location will be fitted a Hormann heavy duty aluminium frame collapsible dock shelter or equal and approved, 3500mm wide x 4400mm high x 900mm projection from building line with 3mm thick (3500gm/m^2) 1500mm long PVC front flap with twin white chevron markers to each side flap, top section of the shelter designed to assist rain water drainage with 100mm sloping roof from back to front. Based on 1200mm dock height sealing range to cater for vehicles 4000mm high up to a maximum 5200mm high.

External 24V DC 100mm dia red and green LED traffic light system with directional arrows and resin encased to IP680 for heavy duty use. To be fitted between each dock shelter on reversing driver's side compliant to BS 873 standard with mimic / repeater lights incorporated into Hormann composite control panel.

For illumination to inside of trailers fitted adjacent to door internal angle poise dock light reference K1080LED with transformer to reduce from 240v supply, bulb to be cool white 6w LED with 60º lighting array. Angle poised arm to incorporate vertical pivot function.

Below each dock leveller position are to be fitted Energy absorbing Polyethylene low friction PE750 dock bumpers (not plain rubber bumpers) incorporating rubber shock absorbers to reduce collision damage. Bumper size; 220mm wide x 815mm high x 140mm projection fitted with special front plate to be manufactured using high molecular polyethylene which can simply be rotated onsite and interchanged to give four times the life of each buffer. All fixing to be located in rear galvanised housing to ensure uninterrupted flat surface, and removable bottom section are to be provided. Based on 150mm deep bumpers a lip projection of 300mm is required for suitable engagement of trailer beds.

Bumper housings are to be bolted to special front mounting plates 220mm wide x 815mm high x 10mm deep welded to dock leveller frame and angled over the front PC retaining wall with pins/tangs for casting into the finished internal dock slab for added strength and edge of dock protection. Plates to be finished Gloss Black RAL9011, raised gusset supports are to be included to position the bumper + 150mm above dock height.

Each dock location is to be operated using single composite control panel model Hormann or equal and approved, incorporating door up / down / e-stop buttons, dock leveller raise push button, red-green mimic lights, power and auto switch Red-Green traffic lights, power and auto switch LED loading light and equipment interlocks.

Below each dock access bolted down into external service yard slab 1-pair of 2000mm long x 170mm dia galvanised tubular steel wheel guides with FLARED entrance for ease of parking.

2.12 Fire Precaution

The requirements of all relevant and current legislation at the time the works has been 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 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

3.1 Internal Wall and Partitions

Where shown on the drawings a compartment wall between the offices and warehouse areas 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.

3.2 Floor Finishes

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

3.3 Ceiling Finishes

Ceiling finishes to warehouse areas shall be the self-finished soffit of the internal liner sheet. Ceiling finishes to the mezzanine level undercroft are to be compliant with Building Regulations.

4.00 OFFICE BUILDING ENVELOPE

4.1 Structural Frame

The office block structural frame constructed in 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.

4.2 Roof

1.2 mm thick pre-galvanised steel boundary membrane lined wall gutters with 3 mm polyester powder coated aluminium, secretly fixed fascia soffit and capping.

4.3 External Walls

A plasterboard finish provided to the internal skin of external walls to all mezzanine office areas. No internal finishes are to be applied to the ground floor undercroft area.

4.4 Curtain Walling, Windows and External Doors

The curtain walling and glazing system shown to the office elevations will be aluminium and will be Schuco APA or Technal, 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 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 office external doors and frames will be manufactured in Schuco APA or Technal 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.

Circular entrance lobby including canopy and glazed roof. Entrance doors to be automatic revolving doors with ability to stop rotation and fold back function for emergency exit. Doors to incorporate top and bottom deadlock facilities. Additional separate hinged single door for pedestrian / disabled access 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.

Entrance area to include bell push externally. 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.

5.00 OFFICE AND SERVICE YARD HUB OFFICE BUILDING WORKS INTERNALLY

5.1 Upper Floors

Composite metal deck and insitu concrete 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 finished 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.

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

The raised access floor system 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.

Winvic ensured that all junctions between floors and walls are properly sealed so as to maintain thermal, acoustic and fire resisting integrity.

5.2 Stairs

The main staircase and landing constructed of precast concrete complete with handrail.

Balustrades and handrails to the main staircase formed in 45 mm diameter circular brushed stainless steel hollow sections. Stair treads finished with carpet tiles and appropriate contrasting nosings.

All 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.

Secondary escape stair to main office of precast concrete complete with handrail and service yard hub office stair to be an internal unenclosed staircase with polyester powder coated handrail and balustrades. Staircase shall be galvanised.

5.3 Internal Wall and Partitions

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

Where required blockwork walls shall be constructed in concrete blockwork, laid in cement mortar with flush joints and where appropriate, keyed for plaster / render finish. The type of block, thickness of walls and appropriate fire rating shall be in accordance with Structural Engineers details and to the requirements of Building Control.

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

Walls required to be in excess of 150 mm thick shall be constructed in 2 skins of blockwork tied together. Wall to lift shaft to be precast system.

Note the ground floor main office is to be left as “shell only” outside of the core area.

5.4 Internal Doors

Internal doors 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, subject to the Employer's right of rejection. 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. Glazed vision panels shall not be Georgian wired glass.

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

Ironmongery good quality satin anodised aluminium appropriate for office use. To include push and kick plates where required.

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

Master suiting and sub-suiting, combined with external locks provided.

Doors shall be provided to main office ground floor, first floor and service yard hub office

5.5 Wall Finishes

Internal walls to the ground floor main office, first floor main office and service yard hub office areas shall be plastered or dry lined finish, painted with a mist and 2 full coats of vinyl matt emulsion.

Full height wall tiling from the Johnson’s Tule range shall be provided in all toilet areas and ancillary lobbies.

Range: Johnsons Tiles – Minerals
Absolute Colelction
Colour: Chalk
Size 300mm x 300mm

The disabled toilet suitably strengthened to accept grab rails.

Internal walls to reception areasare plasterboard. paintwork, however with the added enhancement of a feature wall. Extent of feature wall shall be as noted on the architect’s drawings.

Winvic have provided 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.

Kitchenette areas are prismatic tile range 200 x 100mm white tiled splashback, 2 courses high.

Window boards within office areas are 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.

5.6 Floor Finishes

The 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.

The main office ground floor area (not core area) has been left as flush with the warehouse floor.

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 heavy-duty anti-static contract carpet tiles:

Range: Bermatex Tivoli Loop Pile
Reference: Multiline Mediterranean Topaz - 20709

Reception area, office toilets, ancillary lobbies areas shall be provided with ceramic floor tiles from the Johnsons Tiles;

Range: Minerals – Absolute Collection
Reference: MIN05N
Tile Finish: Matt
Size: 600mm x 600mm
Matching 200mm x 10mm Skirting.

Kitchenette / tea point and cleaners' areas provided with vinyl sheet floor finish with "coved" vinyl skirting detail;

Range: Gerflor Tarasafe
Reference: 7731 Marbre

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

Timber skirting's throughout shall be 25 x 100 mm American light oak.

Recessed mat-well 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.

5.7 Ceiling Finishes

Ceiling finishes generally to offices 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, subject to the Employer's right of rejection. All ceilings to office areas shall be provided with a 12.5 mm plasterboard and skim finish adjacent to all curtain wall elevations, border shall be 300 mm wide and paint decorated to match ceiling colour.

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 are an 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, subject to the Employer's right of rejection.

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

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

5.8 Fittings

Toilet cubicles where not constructed from masonry or stud partition shall be standard toilet cubicles / IPS walling is to be B100 FA baniain Biachi to the front and N005 Noir to the back of the panel from TLS, Bushboard System or equivalent quality, subject to the Employer's right of rejection. Vanity units provided to match by TLS, Bushboard or equivalent quality, subject to the Employer's right of rejection. Duct panelling system shall be provided to WC's. Toilet roll holders and coat hooks shall be provided to each toilet cubicle.

Within all toilets the following fittings provided:

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

Indicator bolt to doors provided and disabled fittings, grab rails, etc, to any disabled toilets are also to be provided.

Kitchenette / tea point area to be sited adjacent to first floor toilets. To include 1200mm wide base unit with stainless steel sink and drainer. Matching 1200mm wide wall unit over. Kitchenette / tea point area provided with all hot / cold water supplies, drainage and twin electrical sockets above and below drainer / worktop where drawn.

5.9 Fire Precautions

The requirements of the Building Control Officer have been 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 firefighting equipment are specifically excluded.

5.10 Sanitary Appliances

All the toilet areas and cleaners' area shall have Armitage Shanks or equivalent quality white vitreous china sanitary ware.

All horizontal and waste pipework within toilet areas concealed with suitable maintenance access.

Armitage Shanks 'Back to Wall' WC's suites or equivalent quality, 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.

Armitage Shanks china single bowl urinals or equivalent quality, provided with hidden cisterns and supplies, note this is to include cistermisers.

Wash basins to toilets shall be 585 mm x 420 mm Armitage Shanks part projecting basins , with push taps with aerated outlets. These are fitted into plastic laminate covered block board vanity units. Captive basin wastes to be utilised.

Exposed service pipework chrome plated. All waste pipes are 'boxed in' if in exposed areas.

Provision for cleaner's storage area at ground floor level. To include alder fireclay sink bucket stand, provided with hot and cold water services with 1/2" cross head bib taps.

A toilet compartment 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.

5.11 Lift Installation

As indicated on the drawings, an 8 person lift to the upper floors of the office areas (i.e. 1 stop), all to meet the requirements of EN81-2 and Part M2 Building Regulations for disabled access.

Each landing has a stainless steel lift entrance doors and surround. Stainless steel push button controls located adjacent to the lift entrance doors. Jamb protection by way of a hardwood lining will be provided to the lift opening on all floors.

The lift car have a plan dimensions of 1350 mm x 1400 mm deep, constructed of steel and complete with stainless steel car doors carpeted floor, stainless steel walls, stainless steel ceiling and half height rear mirror. A full set of car controls incorporating floor selection buttons fitted at a height to comply with Part M2 Building Regulations, with brail facility on all buttons both within the car and floor call stations.

The electrical Contractor has supplied and installed a local distribution board or supply suitable for the size of lift. It is the lift manufacturer's responsibility to connect to this board / supply for all necessary supplies and lighting to the lift shaft.

The lift shall be from Schindler or similar approved and shall be a motor roomless type, Otis Gen2 Flex. The emergency phone point shall be located in the ground floor ceiling void.

The lift has been installed, tested and commissioned .

As suitable telephone line provision shall be installed for future connection on commissioning.

Lighting to the control panel area has achieved a minimum of 200 lux.

6 & 7 MECHANICAL AND ELECTRICAL SERVICES

The Engineering Partnership (TEP) have been appointed to provide performance specification and concept drawings for the Mechanical and Electrical Services, this information shall take precedence in the event that there is a conflict of specification.

6.1 Mechanical Services

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

Services are sized to suit a fully fitted out Cat A office fit out to the first floor and second floor the ground floor is to remain shell only for future fit-out if required by the tenant or occupier.

The mechanical services 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.

6.2 Gas Supply

Provide mains gas supply to an external metering kiosk and capped ready for a future meter provision and connection into the building. Capped supply to be for Tenant application. Position to also take account of later Tenant warehouse fit out.

Base Build capped supply capacity size to comply on a Provisional capacity 1,000kW It The m&e contractor verified this as part of the design based on the future fit-out requirements for frost protection as set out by the part L2 (SBEM) calculations which the contractor has undertaken to set the minimum efficiency standards to maintain BREEAM and EPC Ratings.

6.3 Design Conditions

The following design parameters have 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

Offices	10L/S/person
Toilets	To Building Regulations Part F
Kitchenette / tea point area	To Building Regulations Part F

Noise Criteria

Offices	NR38
Toilets	NR38
Plant Room	NR50

6.4 Heating, Cooling and Ventilation Installations

Space heating equipment or installations to warehouse / production areas is excluded as part of the Base Build works. Tenant fit out works may require space heating equipment installations.

The warehouse part of the development is a shell & core whereby the Tenant shall be responsible for the design and installation of the heating system for this space. For the purposes of the As Designed SBEM calculation undertaken by the Developer the heating fit out requirements of the warehouse has been included within the calculation in compliance with Part L to determine the minimum efficiency requirements of the future installation and to ensure that the development meets it sustainability and efficiency targets.

The Contractor shall note that the As Designed SBEM calculation undertaken by the Developer has assumed that the future warehouse heating system will be an air rotation or radiant heating system. The Tenant in his design of the warehouse heating system shall refer in full to the Developers As designed SBEM calculation to ensure that the system chosen meets the minimum efficiency criteria of the assumed an air rotation or radiant heating system and shall ensure that his design shall maintain as a minimum requirement the efficiency standards met at design stage.

Heating and cooling to the offices and reception area are provided by VRV/VRF systems manufactured and supplied by Mitsubishi Electric.

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.

Fresh air shall be provided by heat recovery fresh air units supplied by Mitsubishi Electric . These are located in the ceiling voids above the offices, drawing air in and exhausting air out through the façade and delivering treated air into the back of the indoor units.

Gravity condensate drains installed for each indoor unit.

The necessary condensing units located in a secure and gated external compound, refrigeration pipework, power and control cables shall be routed between the condensing units and the indoor units as necessary. All external refrigeration pipework shall be insulated with Class O grade insulation, which are painted with an anti-UV paint and provided with physical protection from galvanised cable tray inverted over the main pipe support tray to prevent attack from vermin.

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

All intake, supply and return ductwork from the Fan Coil or Heat Recovery units thermally insulated and incorporate a vapour barrier. These ducts 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 carried out by CES / D1 Installer and extended warranties provided by the installer / manufacturer.

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

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

Provided, installed and commissioned extract systems to the toilets and canteen in full compliance with Building Regulations requirements.

Provided and installed 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.

Provided and installed all grilles, diffusers and louvres. All colours to co-ordinate with external finishes.

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

Provided and installed all ductwork installations including all secondary steelwork support.

Ventilation rates are based upon one person per 10m² of floor space requiring a rate of 10l/s/person.

Supplied and fitted suitably sized weather louvres for the intake and extract connections to the heat recovery systems including the fitting of these onto the external elevation of the building. All colours to co-ordinate with external finishes.

6.5 Domestic Water Services

A mains cold water service extended from the intake point of the offices to serve all sanitary appliances and the kitchenette / tea point area. To also include the warehouse toilet and shower / wash block.

The plumbing system including hot and cold feeds to all sanitary ware 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 have been concealed, with access through suspended ceilings, raised floors etc. No flexible hoses have been used for any form of connection.

Hot water to toilet areas shall be by electric under sink heaters. Contractor to design and confirm the size of heating unit and unit storage size.

The installation 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 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 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 surfaces disinfected in accordance with BS 6700 and HSG (70) immediately prior to hand over.

All outlets are directly mains fed with all control devices, including back siphonage, as required to comply with water regulations.

No water storage has been provided. However Contractor to undertake detailed pressure drop calculations to ascertain if water boosting will be required in consideration of the utility company pressure guaranteed at site boundary.

Distribution pipework 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 chrome plated finish with matching fittings and brackets.

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

A single external watering point will be provided, comprising a WRC approved outlet complete with hose union tap for a Class 4 water source. The supply shall be taken from the metered MCWS and shall be compliant with the relevant water byelaws.

6.6 Controls

The VRV/F and Ventilation system are fully controlled from a proprietary VRV/F control system, supplied by the system manufacturer. Each defined zone (each floor) is provided with the ability to be controlled as a separate time zone, with independent temperature and time controls in each zone. Each indoor VRF/V unit has its own wall mounted controller for local independent control of each unit. The control system has a central supervisory control and full fault analysis of the VRF systems.

The VRV/F control system is fully interfaced with the fresh air ventilation systems to provide transparency of operation through the user interface.

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.

6.7 Testing and Commissioning

All services are tested and commissioned in accordance with CIBSE technical memoranda, guides and commissioning codes.

Services has been left fully operational.

A draft copy of the Operational Maintenance Manual was issued for comment.

Following Practical Completion, electronic versions of the 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

6.8 Health and Safety Files / Operating and Maintenance Manuals

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

A draft copy was made available two working weeks prior to Practical Completion. An electronic version of the file is also to be provided copies following Practical Completion.

Winvic nominated a suitable person to monitor the commissioning on behalf of the client in accordance with BSRIA and CIBSE Regulations.

7.00 ELECTRICAL SERVICES

7.1 Testing and Commissioning

The electrical services work designed and installed in compliance and the recommendations of the 18th 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.

Services are sized to suit a fully fitted out Cat A office fit out to the first floor and second floor the ground floor is to remain shell only for future fit-out if required by the tenant or occupier.

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

7.2 Electricity Supply

The HV cabling, transformer, LV cabling and switchgear up to the metering point, inside the warehouse, have been adopted by an appropriate (i)DNO. The capacity to be a minimum of 1500 kVa.

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

7.3 LV Panel and Distribution Boards

The LV panel and distribution boards are 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.

The office distribution boards are in accordance with BS 5486 and be complete with necessary MCCB's and MCB's together with 50% allowance for spare ways.

7.4 Sub Main Cables and Cables

Sub main cables 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 are continually rated and designed in accordance with BS 7671 Requirements for Wiring Regulations.

Sub main cables are 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 are 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.

7.5 System of Wiring

The lighting and power installation to the offices and 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.

The use of modular wiring systems for the office lighting will be acceptable.

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 and levellers will generally be carried out with XLPE/SWA/LSF cables to distribution boards, high level bus bar to doors and docks with tap-offs to suit.

7.6 Lighting Installations

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

Offices 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.
Kitchenette/ tea point area	600 mm x 600 mm square LED recessed high frequency lay-in luminaries with FR dished prismatic controllers to give an average illumination level of 400 lux at 850 mm above floor level with a uniformity not less than 0.8.
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;

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 the office 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

Loveday Lighting has been employed to design the external lighting layout to achieve discharge of planning conditions in advance of construction works. This information shall take precedence in the event that there is a conflict between specifications.

LED Floods, Holophane to building periphery and on columns to provide a minimum average of 30 lux with 40% uniformity within service yard as per BS EN 13201 – 2:2003, Table 2 Class CE1. For local lighting above loading bays Metal Halide Floods, Kingfisher Stellar 1 Asymmetric Reflector with zero tilt mounted flat to ground. Car Parking and Road Areas from 4 – 6 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 gatehouse. 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 or protected by Armco type barriers. All lamp columns in car parks to be located in landscaped areas or alternatively protected by a barrier system.

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 offices consisting of perimeter zones to the windows 4m deep by 6m long maximum with adjustable level sensing to provide dimming to 10% of maximum.

7.7 Power Installations

Electrical power supplies will be provided generally as follows:

Signs

2 no 20 amp SP supplies to external signs using LSF/SWA/LSF cable in duct to the main entrances to the site. Supplies controlled by a digital 7 day, 7 event time switch in office entrance lobby;

INDUSTRIAL UNIT
CALDER PARK, WAKEFIELD

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 office floor levels. Underfloor busbar to be installed to allow for fit out of recessed floor boxes at the rate of 1/10m² throughout the office area including 2no. DSSO's, 1 no 30mA RCD module and 4 back boxes for RJ45 outlets. Floor boxes shall be provided with 1m tail for ease of relocation No allowance has been made for underfloor containment for the telephone or data cabling. All telephone and data cabling and underfloor containment 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.
Service Yard Hub Office	Surface mounted dado trunking to all walls to this area only.
Stairways	1 no single switched socket outlet at ground and first / second 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);
Corridors	1no single switched socket outlet per section of corridor;
Kitchenette/ tea point area	2 no twin switched socket outlet over work top. 2 no single switched socket outlets below worktop;
Toilets	Fused connection units are to be provided for hand driers (by others) in each toilet area. Disabled WC alarm system to be provided with 1no alarm pull cord and sounder to each disabled toilet;

Other Offices / Ancillary	1 no twin switched socket outlet per 10 lineal metres wall girth (minimum 1 no per room/area);
Warehouse doors and Levellers	TP & N supplies to doors; TP & N Suppliers to levellers. All supplies are to be from a separate distribution board located adjacent to the doors.

7.8 Fire Alarm

A new fire alarm system utilising an open protocol analogue addressable system installed with the panel in the main reception area. The system 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. The system provides a minimum requirements to warehouse area such as break glass points where required. Steel ties shall be used throughout. The system shall be designed to allow for additional capacity for the Cat B installation throughout the development to suit tenant requirements.

7.9 Lightning Protection

A lightning protection system provided to the building in accordance with BS EN 62305. Full system to be retested 9 months after Practical Completion and any necessary remedial works undertaken.

Surge protection to be provided to the main electrical panel.

7.10 Metering

Sub meters provided as per the building regulations but not less than the following:

Office Lighting;
Office Small Power;
M & E Plant;
Operational Areas;
Ancillary Areas.

7.11 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.

7.12 Testing and Commissioning

The complete electrical installations 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 nominated 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 two working weeks prior to Practical Completion and two copies at Practical Completion.

7.13 Health and Safety Files / Operating and Maintenance Manuals

The Health and Safety Files / Operating and Maintenance Manuals have been formatted as agreed with client and Principle Designer detailed.

An electronic version of the file is also to be provided.

8.00 EXTERNAL WORKS

8.1 Road Crossover / S278 Works

The Contractor carried out all works into the site from the end of the adopted highway.

8.2 Service Yard Area and Access Road

The service yard and associated access areas designed in accordance with the design principles of TR 66 and excavated to the required formation level, trimmed and compacted with a layer of hardcore to the engineer's details blinded with fine chippings.

Sand or rock sand have not been used 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 +5 mm or -30 mm.

A minimum 190 mm thick bed of concrete laid on 1000 gauge polythene or equivalent quality, 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 are formed in accordance with the recommendations of the structural engineer. The slabs 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 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 ± 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 provided.

All concrete work generally 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".

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

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

8.3 Car Parks

i. 80 mm 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 to BS EN1338: 2003. All block paving to be laid in accordance with BS 7533-3:2005 +A1:2009 and manufacturer's recommendations.

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

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

iv. Car parking spaces are 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 baysmeet Local Authority requirements.

v. Fire appliance route – propriety grasscrete surface finish and seeded.

8.4 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. Provide Trief kerbs to all vulnerable corners for vehicle movements.

8.5 Footpaths and other access

Footpaths 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 100 mm coloured concrete block paving in Herringbone pattern to paths around the office area. 60 mm thick charcoal coloured concrete block paving to circulation areas. (Where not subject to access by articulated vehicles. Block paviours were well mixed before laying. Patches and damaged blocks are unacceptable and were rejected.

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

iii. Access provided to the offices for window cleaning equipment.

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

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

vi. Fire appliance access to be grasscrete.

8.6 Landscaping

The approved landscaping scheme 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 includes for a 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

Adequate watering points shall be provided evenly distribution around the building for watering purposes.

8.7 Fencing

2.4m high black paladin steel fencing and automatic barriers provided to the front perimeter of the service yard. From the corner of the main building to the corner of the service yard. With manual gates at the entrance.

A manual barrier shall be provided to the East car park.

A timber hit and miss fence provided to the condenser locations for the VRV system including lockable access gates. Positions of units and enclosure to be agreed with the Employer's Agent prior to installation.

8.8 Drainage

i. Existing drainage connection points to the plot are to be utilised in accordance with the engineers drawings.

ii.

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

iii. Pipework

Any adoptable foul and storm drainage 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 are 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 be provided. Flexible joint covers provided to drainage pipework when leaving the building areas.

iv. Manholes and Inspection Chambers

Manholes 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 provided in the walls of manholes. Chamber covers shall be galvanised steel or cast iron of an appropriate load bearing capacity.

Chamber covers are square to the building and positioned to avoid entrance and service doors.

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

v. Main Sewer Connection

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

vi. Gullies

Gullies to access roads, service yards and car parking areas are 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.

vii. Petrol Interceptors

Petrol/oil interceptors as required for pollution prevention, 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 gatehouse or main office building where applicable.

viii. CCTV Survey

Upon completion of the drains but after cleaning, a CCTV survey has been 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.

8.9 Ramps

Where ramps are required 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.

8.10 Retaining Walls

No retaining walls have been provided.

8.11 Cycle Shelter

Provide and fix cycle shelter, numbers as required to suit planning approval and BREEAM requirements.

8.12 Sprinkler Tank Base

Prepared gravel area suitable for installation of sprinkler tanks by occupier. Size and location as tender drawings. Area shall be suitable for 2 Nr. 8.5 metre diameter X 10 metre high tanks and associated pump house of dimensions 6 metre x 6 metre. A water supply connected to fire hydrant with isolator valve and an appropriate sized foul drainage connection for drain down and testing purposes has been provided.

8.13 External Services Generally

The Mechanical and Electrical Contractor carried 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 are capable of being monitored by a future BMS system.

8.14 Electric Supply

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

The contactor designed the on-plot electricity supply from the connection point to incorporate HV cabling, transformer, LV cabling and switchgear up to the metering point, inside the warehouse to adoptable DNO standard.

The electrical Contractor have 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 installed to the substation and switch room, with frost protection. The lighting to achieve 250 lux and emergency to 1 lux.

5 Chargemaster Fastcharge Floor mounted Electric Vehicle Charging Units with dual sockets to provide charging for 10 vehicles. Ducts and draw cords for any future electric vehicle charging points are to be provided as required.

8.15 Gas Supply

The contractor designed the on-plot gas supply form the connection point and provide A gas service to suit the demand of the building, the gas supply was sized to suit a heated warehouse to an ambient temperature of 15 degrees. The trench will extend from the site boundary to the intake position.

8.16 Water Supply

The contractor designed the on-plot water supply from the point of connection. A metered domestic water supply will be provided from the site boundary / public supply to serve the building.

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

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

A 100mm nominal bore water unmetered supply provided for future use by occupiers for the provision of a future sprinkler installation.

8.17 External Ducts

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.

Ducts installed for future sprinkler pipes under the service yard and from the building to external bases (eg Gatehouse slab). Each set of ducts will enter the building and pass below ground to provide a system to cater for the future.

2 no vacant ducts not less than 75mmØ 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.

1 no 75mmØ duct provided from the building to any remote utility meter.

2 no 100mmØ provided from the building to the gatehouse, interceptors or other items requiring power / monotoring which are remote from the building.

3no not less than 90mmØ will be provided from the building to 3no car parking spaces adjacent to the building. EV charging points are to be provided as required by planning complete with appropriate routed connection to the LV panel. Ducts and draw cords for any future EV charging points are also to be provided as may be required.

The provision of 10 electric car charging bays has been provided via 5 double charging points are to be provided. Ducting is to be provided for the provision of future car charging points refer to TEP consultant's specification.

8.18 Gatehouse

A cladded gatehouse or overclad modular gatehouse provided to match the appearance of the buildings. The ground floor slab will be 100mm thick with a power float finish to receive vinyl floor covering. The roof will be a steel frame construction with profiled steel cladding as the main building.

All internal walls and ceiling will be dry lined and painted one mist coat and two full coats of emulsion paint. The toilet area fitted with a white vitreous china W.C. suite and exposed dual flush plastic cistern and plastic seat cover. The gatehouse floor covered in slip resistant vinyl flooring.

A white vitreous china wash hand basin fixed to painted brackets with waste, plug and chain and taps and having a white glazed ceramic tile splashback 450mm high. The gatehouse toilet is to include a toilet roll holder, mirror and Mistral hand dryer.

A fully serviced single drainer stainless steel sink and good commercial quality base unit provided together with worktop, hot and cold water services provided.

Within the gatehouse a laminate faced block board console will be provided to accommodate the CCTV monitors, control equipment and VCR's complete with lockable cupboard for tape storage.

The gatehouse provided with lighting and small power.

The opening hatches to either side of the gatehouse horizontal sliding lockable windows. All windows are to match the specification of the main building.

8.19 Attenuation

Surface water attenuation is constructed in accordance with the Flood Risk Assessment and is to connect / outfall to the existing drainage connection points.