



VOLUME A

WORK REQUIREMENTS

**Refurbishment of Barrack Foremen of Works (BFW) Offices and Ablutions
at
Gormanston Camp, Gormanston, Co. Meath.**

for

THE MINISTER FOR DEFENCE

CONTENTS

Section A General Information and Conditions

Appendices

- A: Safety documentation required from contractor to be submitted prior to commencement of work on site
- B: Typical information required to be handed over to the employer's representative on completion of the project and to be made available to the PSDP to allow compilation of the safety file

Section B Material and Workmanship General Specifications

Section C Detailed Requirements

Appendices

- A: *Drawing Schedule*
- B: *Information to be provided to the ER and PSDP to allow compilation of the Safety File*

Section A

General Information and Conditions

SECTION A – CONTENTS

1. **General Information**
 - 1.1 Location of the Works
 - 1.2 Proposed Works
 - 1.3 Examine the Site
 - 1.4 Site Visits
 - 1.5 Working Hour Restrictions
 - 1.6 Water and Electrical Power
 - 1.7 Waste Management and Cleaning
 - 1.8 Protection of the Works
 - 1.9 Asbestos Products
 - 1.10 Access to and Fencing off the Site
 - 1.11 Freedom of Information Legislation
 - 1.12 Temporary Works and Scaffolding
 - 1.13 Making Good
 - 1.14 Existing Services
 - 1.15 Measurements
 - 1.16 Maintenance Obligation for Defects Period
 - 1.17 Schedule of Dilapidations
 - 1.18 Setting Out
 - 1.19 Sequencing / Phasing
 - 1.20 Contract Site
 - 1.21 Site Records and Quality Procedure
 - 1.22 Setting out the Works
 - 1.23 Submission of Samples
 - 1.24 Day-works
 - 1.25 Water and Electric Power
 - 1.26 Submissions for Acceptance of Approval
 - 1.27 Co-ordination
 - 1.28 Quality Control
 - 1.29 Workmanship
 - 1.30 Documentation
 - 1.31 Environmental Protection
 - 1.32 Materials and prefabricated Items
 - 1.33 Site Compound
 - 1.34 Use of Defence Forces' Facilities by Contractor's Personnel
 - 1.35 Telecommunications
 - 1.36 Materials, Workmanship and Equivalent Items

2. **Security / Health and Safety**
 - 2.1 Safety, Health and Welfare at Work legislation and regulations
 - 2.2 Responsibility
 - 2.3 Protection
 - 2.4 Safety, Health and Welfare at Work (Construction) Regulations
 - 2.5 Project Supervisor for the Design Process
 - 2.6 Safety and Health Plan – Preliminary
 - 2.7 Project Supervisor for the Construction Stage
 - 2.8 Safety File
 - 2.9 Notification of the Health and Safety Authority
 - 2.10 Safe Pass accreditation
 - 2.11 Security
 - 2.12 Confidentiality of Project Details
 - 2.13 Photographs for Passes
 - 2.14 Private Security Authority Licence
 - 2.15 Specific Safety Requirements

- 3. **Contractual Requirements**
 - 3.1 Conditions of Contract and Articles of Agreement
 - 3.2 Inconsistencies
 - 3.3 Contract Date, Starting Date and Date for Substantial Completion
 - 3.4 Remedial Work during Defects Period
 - 3.5 Tender documents only for intended recipient
 - 3.6 Lowest or any other Tender
 - 3.7 Insurances
 - 3.8 Insurance of the Existing Building
 - 3.9 Performance Bond
 - 3.10 Currency to be used in pricing the Works
 - 3.11 Publication of Tender Information
 - 3.12 Pay and Conditions of Employment
 - 3.13 Prompt Payment of Accounts
 - 3.14 Materials, Workmanship and Equivalent Items.
 - 3.15 Programme
 - 3.16 Training of Employer's Staff

- 4. **Building Regulations and Specialist Works Certifications**
 - 4.1 Building Regulation Compliance
 - 4.2 Electrical Subsystems Certification
 - 4.3 Fire Certifications and Markings

- 5. **Taxation**
 - 5.1 Value Added Tax
 - 5.2 Tax Clearance Certification

- 6. **Definitions and Explanations**
 - 6.1 ER
 - 6.2 The Works
 - 6.3 Re Use from Store
 - 6.4 Store for Re Use
 - 6.5 Plugging
 - 6.6 Change
 - 6.7 Abbreviations
 - 6.8 Euro norms, Irish Standards, British Standards and British Standard Codes of Practice
 - 6.9 Supply Only
 - 6.10 Fix
 - 6.11 Fix Only
 - 6.12 Timber Sizes

APPENDICES to SECTION A

Appendix A: Safety Documentation required from the Contractor

Appendix B: Information to be issued by the Contractor for compilation of the Safety File.

1. GENERAL INFORMATION

1.0 Introduction

The works are located within the compound area that is adjacent to Hangar No.1 and include the refurbishment of existing offices and ablutions to provide permanent offices and ablutions for Barrack Foremen of Works (BFW) staff within Gormanston Camp.

A summary of the works is as follows:

- Disconnect all existing electrical and plumbing services.
- Removal of all external and internal doors and windows.
- Demolition of existing block and concrete walls and lean to roof.
- Excavation of new internal and external foundations.
- Construction of new internal and external foundations.
- Construction of new lean-to roof including all new cladding, associated flashings and rainwater goods.
- Construction of internal and external block walls to form offices, kitchenettes, ablutions and openings.
- Installation of new electrical, mechanical, water and wastewater services.
- Installation of new floor coverings to offices, hallways and ablutions.
- Installation of 2no. new kitchenettes, sanitary ware and fittings and all internal and external joinery items.
- Painting of internal and external walls.
- Testing, commissioning and certification of all new electrical, mechanical, water and wastewater services.
- Cleaning of all areas used during the completion of the works.

The overall project will be carried out by way of one contract. The contract documents, which this document will form part of, relate to this contract.

All requirements of the specification will be costed as per the detail provided. Failure to comply fully with the requirements of the tender document will result in rejection of the tender offer.

1.1 Familiarisation with the Site

The Contractor will be deemed to have examined the site to ascertain the conditions under which the installation will occur and the nature of the structure being worked upon. The Contractor will be deemed to have included in the contract sum, all factors affecting the work. Claims for delay or compensation events arising from the lack of knowledge of site conditions will not be approved.

The Contractor shall include all works deemed necessary to make the site safe for both workers on-site as well as working personnel in location.

Site Visits can be arranged by contacting Capt. Ciaran Carey (Area Engineer Officer). Mobile 085-7486258.

1.2 Scope of Works

The Tender submission will be broken down as shown on the Tender Summary and Cost Breakdown sheets included in the Tender Documents.

1.3 Programme of Works

The Contractor shall submit to the Engineer his planned timeline and a full method statement for the execution of the required work together with cash flow projection.

1.4 The Site

The site is located in Gormanston Camp, Gormanston, Co.Meath.

1.5 Working Hours Restrictions

Except with prior approval, the Contractor will only be allowed to carry out work on site between the hours of:

Monday to Friday: 0800hrs to 1700hrs.

Saturday: 0800hrs to 1300hrs.

Work will not be permitted on Public Holidays nor on Sundays.

1.6 Water and Electrical Power

There is a water mains supply to the site. Electric power is available on site.

1.7 Waste Management and Cleaning

The Contractor shall dispose all rubble and waste arising from the works off-site as it arises. The Contractor shall maintain at all times on site a waste skip, or skips, appropriate to the work being undertaken from time to time. Skips shall be properly protected against wind dispersal of materials therein and clearly marked to avoid creation of a hazard by either day or night, removed and replaced whenever filled.

The Contractor shall be deemed to have included in his tender for thoroughly cleaning the site of the Works and any other areas affected by it on completion of the work. All rubble, plant and materials shall be removed and any areas damaged shall be reinstated at the Contractor's expense. Where relevant to the specific project, all mortar and paint splashes shall be carefully removed and backgrounds left perfect, glass and mirrors cleaned and polished, carpets thoroughly vacuum cleaned and vinyl and linoleum coverings sealed in accordance with the manufacturer's instructions.

In the event of the Contractor failing to comply with the above requirements, the Employer shall retain a specialist company to carry out this work in accordance with the procedures set out in the Conditions of Contract. The cost shall be charged to the Contractor and shall be deducted in the calculation of the amount owed to the Contractor.

All waste disposal is to comply with the relevant regulations and statutory acts. This will consist of using an agent holding a current Waste Permit Licence from the Local Authority in whose functional area the disposal of the waste is to take place.

1.8 Protection of the Works

The Contractor shall be deemed to have included in his tender for the protection of all the completed works, existing structure, adjoining structure, windows etc. and the provision of temporary coverings and weatherproofing wherever the building is opened to the weather.

The Contractor shall be responsible for any damages caused to the structure and fabric of the building during the course of the works and these shall be repaired immediately at the Contractor's expense.

1.9 Asbestos Products

Where asbestos is known to be present in an area on which work is to be carried out as part of this project, the procedures for dealing with it are set out in the tender documentation.

Where the tender documents do not provide for the presence of asbestos and the Contractor encounters any material suspected of containing it. Where asbestos is found or suspected to be

present in areas not identified in the tender documents. Work shall be immediately suspended in its vicinity and no other work shall be carried out which might expose either the Contractor's personnel or third parties to contact with the suspect material or of releasing it into the environment. The ER shall be informed immediately and his instructions awaited. If any of the material has been disturbed, the area shall be sealed off and the advice of the Health and Safety Authority sought immediately on the treatment required for personnel who may have been in contact with it.

After the immediate isolation of the area found to be contaminated, the directions of the ER shall be sought about the procedures to be followed and how the works are to be progressed so that delay and disruption is minimised

Work on asbestos containing materials shall be carried out in accordance with the appropriate legislation and regulations.

1.10 Access to and Fencing off the Site

The Contractor shall provide a secure and clearly marked hoarding to ensure that the extent of the site area being worked is clearly defined. The Contractor shall mark it with warning signs to make clear that access to third parties is not allowed. Hoardings and gates shall be a minimum of 1.8m high and may be either Heras type fencing, securely located, or boarded and framed panelling.

The Contractor shall confine his operations and site occupation to the area within the hoarding except when necessary to carry out work forming part of the Works Requirements.

Where it is necessary to open trenches or carry out other work outside the hoarding line the work and its associated dangers shall be clearly identified. If it necessary to leave excavations or incomplete ground works in place outside working hours that may present a threat to third parties the Works shall be fenced off, marked with warning signs and provided with warning lights.

The areas to be hoarded off are shown on the Site Plan. The Contractor shall allow for removal of the hoardings on completion of the work on site and make good. The Contractor shall use enclosed areas as the project, material storage and administration area. The Contractor will make good the site on completion of the works by reinstating all damage caused, including that caused to areas outside the site area.

The Contractor is required to make arrangements for parking by his personnel, sub-contractors or any other visitors to the site within the site area.

1.11 Freedom of Information Legislation

The Department undertakes to use its best endeavours to hold confidential any information provided by the tenderer subject to the Department's obligations under law, including the Freedom of Information of Act, 1997 and its amendments. Should the tenderer wish that any of the information supplied by him with the tender submission should not be disclosed because of its sensitivity he should, when providing the information, identify same and specify the reasons for its sensitivity. The Department will consult with the tenderer about this sensitive information before making a decision on any Freedom of Information request received.

If the tenderer considers that none of the information supplied is sensitive, he shall make a statement to that effect. Such information may be released in response to a Freedom of Information request.

1.12 Temporary Works and Scaffolding

The Contractor must provide and maintain all necessary temporary supports, shores, etc. required for upholding the existing work during the course of the Works. The Contractor shall alter and adapt the temporary Works as necessary and shall clear them away and make good any work

disturbed on completion. The Contractor will be solely responsible for the adequacy of the design of temporary supports.

The Contractor shall supply and erect all necessary scaffolding as deemed necessary.

Provide, erect and remove on completion all scaffolding, working platforms, safety netting, overhead pedestrian canopies, etc., in accordance with IS EN 12810 and 12811 and, HSA Code of Practice.

Before alterations are commenced to the structure, the Contractor shall submit details of proposed temporary supports to the ER, particularly where opes are to be formed or where alteration works carried out to structural elements.

1.13 Making Good

The Contractor shall be deemed to have allowed for the cost of all making good in the Contract Sum. All making good is to match the adjoining work in both materials and workmanship, to be of a proper standard of workmanship such as to leave the resultant areas to the satisfaction of the ER. Any unsatisfactory making good is to be rectified at the Contractor's expense.

1.14 Existing Services

The site contains underground services. Their location together with the ground condition should be noted before moving heavy plant or machinery and when planning excavation works. The Works shall be deemed to have been priced on the understanding of such services being encountered and the Contract Sum shall be deemed to have included for the cost of hand excavations in their vicinity and for the measures required to protect them.

The ER shall be contacted to ascertain the presence and nature of existing on-site services prior to any work being commenced on site.

Where described in the Contract, new services (gas, water, electrical, drains) shall be connected into the existing services. Before entering or breaking into an existing services, the Contractor shall give notice of his intention to do so to the ER.

1.15 Measurements

No alteration of required measurements will be allowed. All work shall comply with BS 5964.

Any alteration to any measurement required shall be provided by the ER to the Contractor. Should the Contractor be of the opinion that such an alteration is required he shall seek the confirmation of the ER before adopting a change.

1.16 Maintenance Obligation for Defects Period

The Works Requirements include an obligation to remedying defects, until the expiry of the Defects Period.

1.17 Schedule of Dilapidations

The Contractor, on taking possession of the site, shall submit to the ER a photographic record and a detailed schedule of dilapidation's internally and externally (as appropriate) of areas that will be affected by the execution of the Works Requirements. The agreed schedule will be held as a record on the condition of the existing building when possession was granted. The provision of this record does not mitigate the Contractor's insurance responsibilities under the Conditions of Contract. The Contractor shall also undertake and submit to the Employers Representative a photographic record and detailed schedule of adjacent buildings and roads.

1.18 Setting Out

Setting out shall comply with BS 5964.

At the beginning of the Contract, the Contractor shall establish a master benchmark on site for the duration of the contract. Relate the master benchmark to ordnance datum. The permissible deviation in level between the master benchmark and ordnance datum shall be +2mm.

Set out the works in accordance with the drawings. Establish in an approved manner base reference lines for setting out the works and set out additional reference lines at the following maximum spacing: Vertical 3.0m and Horizontal 30.0m.

Establish reference levels at vertical intervals not exceeding 3.0m. The permissible deviation between any reference level and the master benchmark shall be +/-2mm.

The permissible deviation in the horizontal distance between two adjacent reference lines shall be +/- 2mm. The cumulative permissible deviation in the horizontal distance between any two reference lines shall not exceed +30mm or 1 in 1000 of the cumulative distance whichever is the smaller.

The permissible deviation for the plumbness of the intersections of reference lines over the corresponding intersections of the base reference lines shall not exceed +20mm or 1 in 1000 of the vertical distance from the base reference lines, whichever is the smaller.

The permissible difference in length of the diagonals of any nominally square or rectangular set of reference lines shall be +30mm or 1 in 1,000 of the nominal diagonal length whichever is the smaller.

1.19 Sequencing / Phasing

The Contract Sum is deemed to include for any and all costs associated with providing adequate access to the Works and for maintaining same for the duration of the Works.

The Contractor shall refer to the restrictions and limitations imposed elsewhere in the Works Requirements on hoarding lines and the Contract Sum is deemed to include for any and all costs associated with same.

It will remain the Contractor's responsibility to give reasonable notice of forthcoming operations that may affect third parties in order that the ER is aware of any requirements the Contractor may have and the Employer can be advised accordingly.

1.20 Contract Site

The area to be occupied by the Contractor for the purposes of the contract for any period during the contract are as described and identified elsewhere in the Works Requirements.

The Contractor shall, subject to such reservations as set out in the Works Requirements, occupy the designated area for the relevant period and shall protect and secure it in accordance with the Conditions of Contract.

Fit all compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.

The Contractor shall keep the Works moist where practical to limit the concentration of airborne dust particles during dust generating operations and in particular during cleaning operations.

The Contractor shall ensure that no damage is caused to the existing roads and paths due to the delivery of materials, the execution of works, or the removal of rubbish. All vehicles entering or leaving the site carrying loads which constitute a potential hazard shall be inspected to ensure the loads are properly protected and those requiring attention shall not be permitted to leave the site.

The Contractor shall be responsible for keeping all highways and campus roadways adjacent to the job site free from dirt, dust or other materials which are due to his own and all other operations and safeguard the Employer from any liability resulting therefrom.

In the event of fouling or damage of any roads due to any operations the Contractor shall clean them expeditiously to the satisfaction of the ER. The Contractor shall be entirely responsible for any damage due to his failure to comply with this requirement.

The Contractor is deemed to have made due allowance in the Contract Sum for re-arranging any hoarding, etc., to facilitate his access arrangements and the safety of the public and for the completions of elements of the Works.

The Contractor shall confine his activities to the site included in the Contract and shall not allow his personnel to trespass on other areas of the Campus except for execution of Works included in this Contract.

1.21 Site Records & Quality Procedure

Provide for maintaining a full set of site records of all labour, materials and plant used on the Works to the approval of the ER. These should be issued to the ER every two weeks as part of the Contractors report.

If no quality system is in operation, the Contractor / Sub-contractor must comply with the following minimum requirements:-

- a. Identify the personnel responsible for the project management, site management, safety, and for inspection and testing of the works and for the verification of such tests.
- b. Ensure that an adequate document control procedure is in place for the project, which will ensure that a drawing register is maintained to record details of all drawings received relating to the project, including revision status, and their circulation recorded.
- c. Have clear purchasing procedures, which will document individual orders for all materials to be incorporated in the project. Such documentation or purchase order should incorporate the project number and date of order, the supplier's name, address, description of materials including requirements to confirm to European standards.
- d. All deliveries to site must be checked by a designated person and materials not meeting specifications to be identified, segregated where practical and details of non-confirming product and the remedial action to be taken and recorded.
- e. Provide evidence to the ER if required of specialised training of site personnel.
- f. Provide schedule of inspection and test to the ER, which will list the relevant tests, the persons responsible for carrying out the tests and the personnel responsible for verifying that the tests have been carried out.

The Contractor shall provide and maintain on site for the project team, a digital camera and associated facilities for the provision of photographic records. The Contractor is to provide fortnightly photographic records of the progress of the Works. The Contractor must issue A4 format prints for the ER's information accompanied by a key plan and the location reference, photograph number, date taken and issue date for the photograph.

1.22 Setting out the Works

Prior to commencement on-site the Contractor shall establish and sign off with the ER an agreed datum. The ER shall determine, in relation to that datum, any levels, which may be required for the execution of the Works.

The Contractor shall be responsible for checking all site dimensions against the dimensions indicated on the issued Architect's / Engineer's drawings and satisfying himself as to their correctness.

1.23 Submission of Samples

When requested by the ER, samples of all materials proposed to be used for the works shall be submitted to him, together with the name and address of the supplier and such information, instructions and directions as the supplier has issued. Samples shall be submitted for approval to the ER prior to the delivery of the materials to site.

Adequate time shall be allowed in the programme for the sign-off of all samples by the ER

The Contractor is to note the list of required samples, as set out in the specifications of the relevant design team members' specifications e.g. Architect's specification for Architect's required samples.

The Contractor shall include for supplying and storing systematically the samples requested in a Sample Room. Approved samples shall be retained for comparison with products used in the Works.

All materials and prefabricated items shall be manufactured and tested in accordance with the specified requirements. When evidence of conformance depends solely on inspections and tests performed by a sub-contractor, manufacturer, supplier or independent inspection authority no materials or prefabricated items shall be used in the works until it has been verified that they comply with the specified requirements.

Where appropriate, all materials and prefabricated items delivered to the site shall bear the manufacturer's name, brand name, or any other data that may be required to verify the exact nature of the material or item and relate it to the specified Works Requirements.

Where applicable, materials and prefabricated items shall be obtained from suppliers and manufacturers who have been assessed by an independent certification authority accredited by the National Accreditation Council for Certification Bodies.

Where applicable, materials and prefabricated items shall bear the EN certification mark or other appropriate certification mark.

Transportation, handling and storage of materials and prefabricated items shall be controlled to prevent misuse, damage or deterioration.

1.24 Day Works

Day works shall be executed only with the written permission of the ER. Where this authority is given, original vouchers giving the fullest particulars of hours worked, names of craftsmen and general operatives, together with rates of wages paid, description of work executed, materials, plant used up to Friday and delivered to the ER before the following Friday.

All sheets are to be signed by the foreman and the ER. Such signatures are only to be taken as certifying that the time, materials and plant are correct and shall not be held to justify a claim that the work shall be so charge or that it cannot be measured and priced according to the terms of the contract.

Labour shall be priced at the appropriate SEO rates, hired plant shall be charged in accordance with the Schedule of Plant Charges or local hire rates and materials as per bona-fide invoices (subject to confirmation of competitive procurement). All percentage adjustments provided for by the Conditions of Contract shall be made using the information tendered by the Contractor in Schedule Part 2 to the Conditions of Contract.

1.25 Water and Electric Power

No guarantee shall be given about the amount of power and water available to the contractor or any sub-contractor.

1.26 Submissions for Acceptance of Approval

Where submissions for approval are specified, the Contractor shall prepare and submit with his Master Programme a schedule of such submissions, co-ordinated with the Programme and including agreed time allowance for submissions and approval before the related work commences.

Shop drawings, calculations to support details and components chosen and any other relevant information shall be submitted not less than 2 weeks or 10 working days before manufacture begins. The Contractor shall check that all shop and installation drawings are complete and co-ordinated. The Contractor shall confirm in writing that he has done so.

1.27 Co-ordination

The Contractor shall check all drawings and schedules to ensure in time that he has sufficient information to carry out the work. If the Contractor considers additional details are required, he shall notify the ER immediately.

The Contractor shall obtain approval for the size and position of any hole, chase, insert or fixing required before the related work begins.

1.28 Quality Control

All Works undertaken are to comply with the following:

- The Works Requirements
- Building Regulations and subsequent revisions and associated Technical Guidance Documents.
- Building Control Regulations

1.29 Workmanship

Shall comply with BS 8000: 2011 – Works on Building Sites.

The Contractor shall keep on the works a competent foreman or site agent and any instructions given to him shall be deemed to be given to the Contractor.

1.30 Documentation

The Contractor shall maintain records to substantiate conformance to specified requirements, including work carried out by subcontractors, manufacturers, and suppliers. As required under the Building Regulations Amendment 2013, the Contractor is to provide a Certificate of Compliance by a Chartered and Bonded Engineer.

1.31 Environmental Protection

All construction and demolition waste removed off site shall go to a licensed/permitted waste recovery facility and be carried out by a contracting firm permitted under the Waste Management Collection Permit Regulations 2001 and Waste Management Act 1996.

The Contractor is to take all reasonable precautions to minimise nuisance to the occupants / users of adjoining Defence Forces' properties and to the general public and to include for complying with all statutory regulations in this regard.

Burning of waste/debris will not be allowed on-site as this is an offence under the 1987 Air Pollution Act. Mud or debris will not be allowed onto the public road from works involved from the site.

Dust deposition shall not exceed 340 mg/m³/day beyond the boundary of the site.

Roads in the vicinity of the site shall be sprayed with water in times of dry weather to control dust resulting from operation on the site.

Topsoil shall be stored on site for landscaping purposes as far as possible. Surplus topsoil and subsoil must go to a licensed facility as specified in the Waste Management Act 1996 or to a recovery site with a waste Permit issued by the County Council. The haulier of the topsoil must be permitted under the Waste Management (Collection Permit) Regulations 2001.

No foul water, waste effluent, contaminated water e.g. painters fluids, concrete slurry, plasterers fluids, toxins, etc. shall enter the foul or storm water drainage system or discharge to land drains, soakaways etc.

1.32 Materials and Prefabricated Items

No materials or prefabricated items shall be used in the works until it has been verified that they comply with the specified requirements.

Where applicable, materials and prefabricated items shall be obtained from suppliers and manufacturers who have been assessed by an independent certification authority.

Where applicable, materials and prefabricated items shall bear the British Standards Institution certification mark, the Irish Agreement certification mark or other appropriate certification mark.

Transportation, handling and storage of materials and prefabricated items shall be controlled to prevent misuse, damage or deterioration.

1.33 Site Compound

Provide and maintain toilet facilities, washing facilities, drying room and canteen(s) for the Contractor's staff and watertight facilities for the storage of materials, tools and tackle in positions to be agreed with the ER.

Thoroughly clean area used for the compound, make good and leave in unimpaired condition on Substantial Completion of the Works.

All materials shall be securely stored or tied down. Waste materials, rubble and debris shall be removed from the site as it arises. All possible steps shall be taken by the contractor to ensure that nothing off the site may be blown off the site area. Under no circumstances shall materials be burned on site.

1.34 Use of Defence Forces Facilities by Contractor's Personnel

The Contractor's personnel shall not use the canteen or toilet facilities provided for personnel of the Defence Forces.

1.35 Telecommunications

Connections to the networks of commercial telecommunication providers will not be available for the Contractor's site compound. Connections to the Defence Forces private network will not be provided. The Contractor will be deemed to have included in the Contract Sum for all measures required, and charges arising, to facilitate telecommunication and data services to and from the site.

1.36 Materials, Workmanship and Equivalent Items

All materials used in the work shall be new and unused unless specifically required to be salvaged or re-used by the Contract documents.

Materials and workmanship shall be of the best quality and shall comply with all relevant European Community Standards or, in the absence of such a standard for a product or material, relevant Irish Standards and Codes of Practice.

Materials shall comply with the requirements of the European Communities (Construction Products) Regulations, 1992.

Only fully qualified and competent tradesmen and helpers shall be employed on the Works. Work shall not be sub-let or done by sub-contractors without the Employer's Representative's permission.

All work shall be carried out within the tolerances specified in BS 5606. No work shall be covered up prior to inspection and approval by the Employer's Representative.

Wherever a proprietary name is used to specify a material or process it shall be deemed to have the term 'or equivalent' appended to it.

Where a material or process is described by reference to its proprietary name, the name is used to indicate the standard of construction, appearance, ease of maintenance and durability acceptable to the Employer's Representative. The Employer's Representative will approve the use of alternatives where such alternatives are shown to equal or surpass the qualities of the product or process specified. Accordingly proprietary names wherever mentioned in the Specification, Schedule of Rates or on the drawings shall be deemed to mean the provision of the named product or process or an approved alternative.

SECURITY / HEALTH & SAFETY

2.1 Safety, Health and Welfare at Work legislation and regulations

The Contractor shall be deemed to have included in the Contract Sum for complying with the terms of the above. The Contractor shall be deemed to have included for the preparation of Safety Statements and Health and Safety Plans and for taking all steps necessary to ensure the safety of all persons likely to be affected by the execution of the works.

The Contractor shall incorporate in his Health and Safety Plan measures to deal with any hazards identified in the Barrack Safety Statement, a copy of which shall be made available on request.

The Contractor shall comply in all respects with the requirements of current legislation and Regulations with respect to his employees, specialists, domestic subcontractors, visitors and other third parties. The safety documentation shall be updated during the course of the Works to include any further hazards which may arise.

All statutory safety regulations shall be adhered to in respect of the erection of the structure and all reasonable care shall be taken as a precaution against accidents. The Contractor shall provide for the necessary labour and materials to meet those requirements.

The Contractor shall comply in all respect with the above Act and its subsequent regulations to include:

- Welfare Facilities
- Safety officers, supervisors, first aiders
- Protective clothing, safe pass cards, construction skills certificates scheme, etc.
- Site safety including pedestrian & traffic management, staff parking, suppliers, plant, machinery, power tools, site vehicle, sign lighting & guarding, scaffolding and working platforms, emergency procedures, etc.

2.2 Responsibility

Notwithstanding directions received from the ER, the Contractor is solely responsible for the safety of the Works.

2.3 Protection

The Contractor shall provide for the effective protection of the public, the Employer's Personnel, visitors, and all other persons occupying or using the site and these costs are deemed to be included in the Contract Sum.

2.4 Safety, Health & Welfare at Work (Construction) Regulations

The Contractor shall be deemed to have examined the Works Requirements, the site of the work and access thereto and to have included in the tender figure for all additional work or costs required to allow him carry out the work in compliance with the provisions of the Regulations.

2.5 The Project Supervisor for the Design Process

The Project Supervisor for the Design Process is as named in the Preliminary Safety and Health Plan – see Information Documents accompanying the tender documents.

2.6 Safety and Health Plan – Preliminary

The Preliminary Safety and Health Plan is included with the Information Documents. The Plan will NOT be included as a Contract Document.

2.7 Project Supervisor for the Construction Stage

The Project Supervisor for the Construction Stage (PSCS) shall be the Main Contractor appointed to carry out the Works.

Where a tenderer is not deemed competent by the Employer to act as Project Supervisor for the Construction Stage then the tender submitted by that party shall be passed over and deemed invalid.

In the event of the Employer deciding to enter into a contract for the execution of the Works, the successful firm shall enter into a contract (the 'Main Contract') using the Conditions of Contract as specified elsewhere. The firm shall also enter into a Collateral Agreement to the Main Contract for the provision of the service of Project Supervisor for the Construction Stage and the performance of the duties outlined in the above mentioned Regulations in consideration of the acceptance by the Employer of the tender, or any modification thereof.

The Form of Collateral Agreement shall be the Model Form public Facility by the Department of Public Expenditure and Reform.

2.8 Safety File

Three copies of all information developed or obtained by the Contractor (except for Contract documentation issued to him by the ER) and relevant to the preparation of the Safety File for the project shall be handed over to the ER, on completion of the Works. Refer to Appendices for further information on required contents of the Safety File that the Contractor will be required to co-operate in the compilation of by providing relevant information in his possession.

The Contractor shall co-operate with the PSDP in the preparation of the Safety File and shall provide all relevant documentation in his possession, including all technical manuals and materials safety sheets. The Employer will be unable to take possession of the Works ('Substantial Completion' stage) unless he has received the information and documentation required to allow the Employer comply with his duties in respect of the safe operation of the premises under relevant statutory provisions.

2.9 Notification of the Health and Safety Authority

The notification of commencement of construction of the project to the HSA shall be the responsibility of the Project Supervisor for the Construction Stage - the Contractor.

2.10 'SAFEPASS' Accreditation

The Contractor shall comply with the requirements of the construction industry's safety accreditation scheme, known as the 'Safepass' scheme.

2.11 Security

All Contractor's Personnel that the Contractor proposes to have attend site on a regular basis will be required to undergo Garda Vetting. The application process to be gone through shall be the same as that outlined in the tender documents in respect of the managing director of the tendering firm or the person designated as taking responsibility for the project.

Completed forms for Contractor's personnel shall be submitted to the Officer identified to the Contractor by the ER. From submission of the fully completed application, the clearance process

may take a minimum of six working weeks but could be considerably longer depending on the capacity and workload of the Garda Central Vetting Unit at the time of the submission.

The clearance application process is a two stage process requiring the initial submission of an outline application and evidence of identity to the designated Engineer for the project. On receipt by the applicant of an invitation, the online submission of all required details including names, details of parents, date of birth, history of residence and details of Court convictions (regardless of what any conviction was for).

Personnel may be allowed to access the site during the clearance process at the discretion of the military authorities responsible for the installation but will be denied access in the event of the vetting process leading to any person being deemed unsuitable to be allowed admission to a Defence Forces' establishment.

No reasons will be given in the event of refusal of clearance.

The details of the personnel required on site by the Contractor during the first six weeks of the Contract shall be submitted to the designated Officer within TEN WORKING DAYS from the date of a letter requesting the details. Details shall be submitted on the application forms that will be issued to the Contractor, shall be fully completed and signed by the person for whom clearance is being sought and shall be submitted with the required evidence of identity.

The Contractor will be deemed to have included in his tender for all costs involved in complying with security requirements as described above and for taking all steps necessary should security clearance or access be denied to any person or firm.

Notwithstanding the fact that the work is to be carried out in a security aware area, the Contractor will have sole responsibility for protecting plant, materials, equipment and work executed against damage and theft.

The Minister or any of his officers shall have the right without condition to refuse admission to the site of the works of any person whatsoever. Should an employee of the Contractor be refused admission the Contractor shall provide a substitute employee, acceptable to the Employer and fully cleared for security purposes, in lieu thereof. The requirement for the exclusion of employee(s) shall be deemed to result from an 'act or omission of the Contractor' in accordance with the terms of Clauses 2.7 and 4.5.

2.12 Confidentiality of Project Details

All information that comes into the possession of the Contractor that is relevant to the security of the Defence Forces facility, where the project is located or the project itself shall be treated as confidential and shall not be divulged to any party except to the extent required to deliver the Works Requirements in accordance with the Conditions of Contract.

This obligation shall include information about the design of the Works, the nature of the intended use of the building or project being worked on, the use of adjacent buildings and facilities, access arrangements to the location and information about the operations conducted within that location.

Photographs of the location and of the work being carried out shall NOT be public Facility without the prior written consent of the Employer, which shall only be provided in exceptional circumstances. This publication restriction includes reference to the project in promotion and advertising material prepared for or public Facility by the Contractor.

Advertising signage or project information boards shall not be erected on the site or on the boundary of the facility the site is located in without the prior written approval of the Employer.

The confidentiality obligation shall extend beyond the Contract Duration and it shall be an implied term of the Contract entered into that the Contractor undertakes to comply with this obligation.

2.13 Photographs for Passes

Three passport sized photographs, or alternatively three copies of each person's Safepass card, (with the person's name and address on the reverse) shall be submitted to the party nominated by the ER to allow for the issue of Security Passes.

2.14 Private Security Authority Licence

All providers of security alarm installations and CCTV installations to the project shall be licensed by the Private Security Authority (PSA) in accordance with the provisions of the Private Security Services Act, 2004

2.15 Specific Safety Requirements

The Contractor shall liaise with the DFTC Safety Officer to ensure co-ordination between construction activities and those of other workers and personnel in the DFTC area.

2.15.1 Contractor's Personnel and Site Visitors

The Contractor shall implement an appropriate booking in and out system for all site operatives and visitors, which will be subject to the approval of the Client. All Contractor's

Personnel and visitors to the site must co-operate with the client or his authorised representatives with regard to access and security.

2.15.2 Vehicular Hazards

Temporary signage, lighting and barriers must be erected to ensure the safety of all personnel from vehicular hazards.

2.15.3 Contractor's Deliveries

Contractor's deliveries must only be made at agreed times and must not disrupt normal road traffic. Avoid deliveries during peak times. Ensure that personnel are used to direct traffic during deliveries to the site. Delivery vehicles must be assisted while entering or leaving the site or manoeuvring on the roadway.

2.15.4 Drying the Works

Provide for all necessary equipment, fuel and attendance for drying the works as and when required.

2.15.5 Designer's Risk Assessment

Appendix 'A' of the Preliminary Safety and Health Plan deals with Safety Statement requirements and the evaluation of risk assessed by the Project Supervisor Design Process as of the date of issue of the document. The Contractor's designer (including those of sub-contractors) will be required to make the necessary risk assessments in respect of Contractor's design items and insert them before commencement of the appropriate section of the Works. Reference shall be made back to the Project Supervisor (Design Process) as design development or major changes to design occur.

The Contractor is to consider and make provision to minimise the identified risk and any other risk as may arise and be reasonably foreseeable during the construction phase. The Designer's list will not be an exhaustive list and the Contractor shall exercise due care and diligence throughout the Works together with continued liaison with the Project Supervisor (Design Process) as design development, major changes to design or design amendments that may affect Safety and Health arise.

2.15.6 Contractors Method Statement

The Contractor shall provide the following statements prior to commencement of Works likely to involve any of the hazards listed. This is not intended to be an exhaustive list and the Contractor shall also develop the list as circumstances require:-

- a. Site traffic management.
- b. Liaison with BFW Electrical Staff, CIS Personnel, Military Police regarding the timing and relocation of services.
- c. Working at height.
- d. Working with asbestos.
- e. Hot work.
- f. Manual handling.
- g. Minimising the risk of slips, trips and falls.
- h. Protection measures necessary to safeguard eyesight, hearing respiratory systems, body parts.

2.15.7 Materials Risk Assessments

The Contractor is to provide risk assessments for all materials subject to control under the following statutory instruments applicable to construction sites.

- a. Safety, Health and Welfare at Work (Carcinogen) Regulations 1993 S.I. No. 80.
- b. European Communities (Protection of Workers) (Exposure to Asbestos) Regulations 1989 S.I.
- c. No. 34 – amended 1993 S.I. 276.
- d. European Communities (Protection of Workers) (Exposure to Lead) Regulations 1988 S.I. No. 157.
- e. European Communities (Protection of Workers) (Exposure to Noise) Regulations 1990 S.I. No. 157.
- f. European Communities (Protection of Workers) (Exposure to Chemical, Physical and Biological Agents) Regulations 1989 S.I. No. 251.
- g. European Communities (Classification, Packaging and Labelling of Dangerous Preparations) Regulations 1995 S.I. No. 272.
- h. European Communities (Classification, Packaging and Labelling of Dangerous Substances) Regulations 1994 S.I. No. 77.

The materials specified for use on this project are identified with the tender documentation. There is not an exhaustive list of general or particular material risks. The Contractor shall make his own assessment from the tender documentation or any future changes to the Works Requirements.

2.15.8 Site Rules

A number of specific site rules are brought to the attention of the Contractor. Variations or amendments to these must be agreed by ER and the Project Supervisor for the Construction Stage, otherwise they are to be applied to site operations in full. The Contractor shall draw up an appropriate list of rules covering site safety and personnel and submit it for discussion to the Project Supervisor for the Design Stage.

- a. Define and maintain safe secure access to the site.
- b. Do not impede access to neighbouring buildings at any time.
- c. Fence off site from unauthorised access.
- d. Appropriately, qualified and supervised personnel using specialist techniques designed to minimise the likelihood of inhalation of asbestos material (if present) by any persons or its dispersal will remove asbestos.

Variations to the above will be accepted subject to an agreed procedure to ensure a satisfactory level of site control and safety management is maintained at all times. 'Agreed procedure' means a procedure that is acceptable to the ER.

2.15.9 Safety and Avoidance of Nuisance

All work shall be performed in such a manner as to ensure the safety of the Works and the public and so as to cause as little inconvenience as possible to the public and adjoining buildings and their users. Debris shall be regularly watered to prevent the spread of dust. The Contractor shall be liable for any claims arising from failure to observe the above requirements.

2.15.10 Maintenance of Temperature and Humidity Levels

Provide for all necessary equipment, fuel and attendance for controlling and maintaining the specific temperature and humidity of the works as and when required. The Contractor may not use the permanent heating systems for drying out and maintaining necessary temperature and humidity levels.

2.15.11 Temporary Accommodation and Facilities for Employer

The Contractor is not required to provide suitable accommodation for Site Meetings.

2.15.12 Design of Temporary Works

The Contractor is to design and provide all necessary temporary works required to complete the project including but not limited to screens, stairs, hoists, guardrails, walkways, access ways, etc., all as set out or indicated in the Works Requirements.

2.15.13 Employment of Labour

The Contractor on the Works shall employ only fully qualified and competent tradesmen together with their necessary labourers or helpers and the whole of the same shall be carried out and completed in the best and most substantial manner. The ER shall have the power to exclude/remove from site any person who misconducts themselves or is incompetent or negligent.

3. CONTRACTUAL REQUIREMENTS

3.1 Conditions of Contract and Articles of Agreement

The Conditions of Contract will be the Public Works Contract for SHORT FORM OF CONTRACT (building & civil engineering) as public Facility by the Department of Public Expenditure and Reform. The applicable version shall be that posted on the www.constructionprocurement.gov.ie website ten days prior to the return date for tenders. Further amendments to the public Facility document are listed below.

3.2 Inconsistencies

In the event of there being an inconsistency between documents, the tenderer shall observe the order of precedence as set out in the Conditions of Contract (ref CI 1.4). In the event of there being an inconsistency between figured and scaled dimensions, the figured dimensions shall prevail. All apparent inconsistencies shall be raised with and clarified by the ER before the Contractor orders materials or commences work.

3.3 Contract Date, Starting Date and Date for Substantial Completion

The date for Substantial Completion shall be the date arrived at after the time allowed for completing the works is measured from the Contract Date. The 'Starting Date' shall not be the basis of calculating the date for Substantial Completion.

The Contractor shall sign the relevant part of the Completion Certificate and include all support Ancillary Completion Certificates from specialist sub-contractors for which the Completion Certificate is relying on.

Notwithstanding any statutory duty to retain same, in advance of project completion, the Contractor shall issue to the Employers Representative/Assigned Certifier a copy of all inspection records retained by the Contractor during the course of the project.

The Contractor shall agree a programme with the ER for implementation for the training and Demonstration to the Employer's personnel as appropriate, in the purpose, function and operation of the installations including all items and procedures required. Two training demonstration sessions per system shall deemed to be included in the contract sum.

The Contractor must give to the ER at Substantial Completion, three copies of all manufacturers', suppliers' or sub-contractors' maintenance instructions together with all guarantees, warranties and such like as maybe provided.

3.4 Remedial Work during Defects Period

Items notified by the ER to the Contractor will be classified as detailed below and the Contractor must act as stipulated:

- a. Very urgent defects to be made good immediately upon receipt of notification i.e. any work which causes a threat to safety including burst pipes, gas leaks, electricity failure, security problems and failure of heating or hot water.
- b. Urgent defects to be made good within 24 hours of receipt of notification, i.e. any work which if delayed would cause additional damage or wear.
- c. Routine defects to be made good within 7 working days of receipt of notification.

For defects within classifications (a) and (b), notification may be telephone, subsequently confirmed by email. A note of the time, date and person accepting the message will be taken and the time of the telephone message.

The Contractor shall advise in writing, within 24hrs of receipt of any notification, if any snag or routine defect cannot be rectified within the timescale detailed above (e.g. due to long lead in items).

Should the Contractor fail to rectify the defects within the period stated, the Employer reserves the right to instruct a selected Contractor to immediately correct the defects and to deduct any costs incurred from any sums due or to become due to the Contractor.

3.5 Tender documents only for intended recipient

Tender documents are intended for the specific party to whom they are intended to be issued.

3.6 Lowest or any other tender

The Employer shall not be bound to accept the lowest or any other tender and reserves the right to cancel the tender competition at any time.

In the event of the Employer deciding to accept a tender, the Contract shall be awarded on the basis of the lowest priced suitable tender (suitability refers to such items as capacity, organisation, experience, performance on previous contracts, financial standing relative to the Contract and compliance with any specifications or quality standards laid down for the Contract). Tenderers shall not be reimbursed for the costs incurred in tendering nor, in the event of the cancellation of the competition, in preparing qualification and tender submissions.

Tenders deemed to be abnormally low may be excluded from consideration for award of the Contract. Where a tenderer, or any member of the tendering Group or Consortium, has supplied information that is inaccurate or false in relation to their submission, their tender will not be considered.

Where a tenderer, or any member of the tendering Group or Consortium, is the subject of any of the 'insolvency events' listed below before a Contract award is made, their tender shall be deemed to have been withdrawn and will be excluded from consideration when the decision on the award of the Contract is made.

- a. A petition being presented to wind the tenderer up and not being dismissed within 14 days after presentation.
- b. A meeting of the tenderer's creditors or members being held for the purpose of considering a resolution to wind it up.
- c. The tenderer entering or proposing to enter an arrangement with or for the benefit of its creditors. A petition being presented to appoint an examiner to the tenderer.
- d. A liquidator, examiner, supervisor, receiver, administrative receiver, trustee, encumbrancer, or similar being appointed for the tenderer or any of its assets.
- e. The tenderer ceasing or threatening to cease its business.
- f. The tenderer becoming insolvent or unable to pay its debts as they fall due.
- g. The tenderer, being an individual, becoming bankrupt or dying or becoming incapable of performing this Contract.

Furthermore, tenders will not be considered where the tenderer, or any member of the tendering Group or Consortium, has been the subject of a conviction by final judgement for one of the following:

- a. Participation in a criminal organisation, as defined in Article 2 of Council Joint Action 2008/841/JHA.
- b. Corruption, as defined in Article 3 of the Council Act of 26 May 1997 and Article 2(1) and Article 2(1) of Council
- c. Joint Action 2008/841/JHA.
- d. Fraud within the meaning of Article 1 of the Convention relating to the protection of the financial interests of the European Communities.
- e. Money laundering, as defined in Article 1 of Council Directive 2005/60/EC of 26 October 2005 on prevention of the use of the financial system for the purpose of money laundering.

The tender of any tenderer who is the subject of any of the 'insolvency events' listed below before a Contract award is made shall be deemed to be withdrawn and will be excluded from consideration when the decision on the award of the Contract is made.

- a. A petition being presented to wind the tenderer up and not being dismissed within 14 days after presentation

- b. A meeting of the tenderer's creditors or members being held for the purpose of considering a resolution to wind it up
- c. The tenderer entering or proposing to enter an arrangement with or for the benefit of its creditors
- d. A petition being presented to appoint an examiner to the tenderer
- e. A liquidator, examiner, supervisor, receiver, administrative receiver, trustee, encumbrancer, or similar being appointed for the tenderer or any of its assets
- f. The tenderer ceasing or threatening to cease its business
- g. The tenderer becoming insolvent or unable to pay its debts as they fall due
- h. The tenderer, being an individual, becoming bankrupt or dying or becoming incapable of performing this Contract.

3.7 Insurances

The Contractor shall indemnify the Minister for Defence against all claims arising from the execution of the works that are the subject of the Contract and shall maintain all necessary insurances for the duration of the Contract, all in accordance with the requirements of Clause 10 of the Conditions of Contract. The Contractor shall provide evidence to the Employer that all insurances required by the Conditions of Contract are in place prior to the commencement of work. The insurances shall be kept in place for the periods required by the Conditions of Contract.

The Employer's Liability and Public Liability levels of cover and excess shall provide the minimum levels of cover and excesses set out in the Schedule to the Form of Tender.

The 'All – Risks' insurance policy shall provide insurance cover of an amount not less than the total contract amount plus a minimum of 30% to allow for Value Added Tax, fees and site clearance costs. The 'All Risks' policy shall name the Minister for Defence as a 'co-insured'.

Particular attention is drawn to the provisions requiring the All-Risks and the Public Liability policies to name the Employer as 'co-insured' and for the Contractor's policy providing Employer's Liability cover to indemnify the Employer against the same liability that is provided by the policy for the Contractor.

Any tenderer asked to provide evidence of having, or being able to get, the required insurances shall be required, as a minimum, to provide a statement undertaking to procure the insurances immediately upon entering into a Contract and a further statement from a bona-fide insurance broker that such insurances will be available to the Contractor. A tenderer failing to meet this requirement shall be excluded from further consideration and their tender deemed to have been withdrawn.

Tenderers shall be required to have Employer's Liability insurance cover regardless of whether they directly employ labour or not.

3.8 Performance Bond

Not applicable

3.9 Currency to be used in Pricing the Works

All prices and rates shall be deemed to be denominated in Euros (€).

3.10 Schedule of Rates / Pricing Document

A fully priced and quantified Pricing Document shall be provided by the Tenderer. The total of the quantities shown multiplied by the rates tendered shall equal the tender sum offered. Failure to provide this information with the tender submission, or at latest within 5 working days of it being requested, may result in the tender being deemed invalid.

3.11 Publication of Tender Information

Tenderers are advised that the Employer is obliged to circulate the name and address of the Contractor awarded the work, the type of work involved and the address of the site to a nominee of the Irish Congress of Trade Unions (ICTU).

Submission of a tender shall be deemed to confirm the tenderer's acceptance that he agrees to the circulation by the Department of the above information. Any tender, which a statement stating or implying that the tenderer does not agree to the release of the above information, shall be deemed to have been dis-qualified and may be treated as an invalid tender accompanies.

3.12 Pay and Conditions of Employment

In order to be considered for the award of the Contract, a tenderer must confirm that their firm complies with its obligations under sectoral employment orders, employment regulation orders, and registered employment agreements. Where applicable, registered under the Industrial Relations Acts 1946 – 2015 and is also in compliance with the National Minimum Wage Act by completing the declaration included with the Tender Documents.

The tenderer must show that their firm is a fully paid-up member of the Construction Workers' Pension Scheme and Construction Industry Sick Pay schemes, or approved equivalents. Where employees of the firm are required to be members of them in accordance with the legal requirements covering workers employed in the relevant areas of the construction industry. A tenderer asked to do so shall promptly submit contribution receipts or other evidence of membership acceptable to the Employer. Any tenderer unable to provide evidence of being in compliance with their obligations may be deemed to have withdrawn his tender. A Contractor required to be a member of Pension and Sick Pay Schemes shall remain in membership of them for the duration of the Contract.

A tenderer claiming exemption from the requirement to be a member of the Pension and Sick Pay Schemes on the basis of not directly employing persons eligible for membership of them shall be obliged to provide a detailed proposal of how they intend to have the Works carried out, including how the required labour is to be sourced. Any tenderer proposing to subcontract the entirety of the Works shall be excluded from further consideration and their tender shall be deemed to have been withdrawn. A tenderer proposing to subcontract some elements of the work shall provide details of the planned extent of the subcontract arrangements. Where the arrangements are broadly acceptable to the Employer, commit to the intended subcontractors being in membership of the Pension and Sick Pay Schemes where the work to be so subcontracted falls within the scope of the sectoral employment orders, employment regulation orders, registered employment agreements, where applicable, registered under the Industrial Relations Acts 1946 – 2015.

Contractors may be subject to spot checking throughout the course of the Contract to ensure ongoing compliance with the requirements of the 'Pay and Conditions of Employment of Workers' PW CF6 Clause for all 'Contractor's Personnel', which shall include all persons employed on the delivery of the Works by the Contractor and their subcontractors. The Contractor shall be obliged to submit written confirmation with every payment application submitted of being in compliance with the requirements of the Contract Clause.

3.13 Prompt Payment of Accounts

The provisions of the European Communities (Late Payment in Commercial Transactions) Regulations 2002 concerning the prompt payment of amounts due in commercial transactions shall apply to all sums payable to or by the Contractor or any subcontractors or suppliers for work or items supplied for this project.

3.14 Materials, Workmanship and Equivalent Items

All materials used in the work shall be new and unused unless specifically required to be salvaged or re- used by the Contract documents.

Materials and workmanship shall be of the best quality and shall comply with all relevant Irish Standards and Codes of Practice or European Community Standards.

Materials shall comply with the requirements of the European Communities (Construction Products) Regulations, 1992.

Only fully qualified and competent tradesmen and helpers shall be employed on the Works. The ER must approve all Work sub-let or done by sub-contractors before commencement of the works.

All work shall be carried out within the tolerances specified in BS 5606. All works shall be inspected by the ER prior to covering up.

Wherever a proprietary name is used to specify a material or process it shall be deemed to have the term '**or equivalent**' appended to it.

Where a material or process is described by reference to its proprietary name, the name is used to indicate the standard of construction, appearance, ease of maintenance and durability acceptable to the ER. The ER will approve the use of alternatives where such alternatives are shown to equal or surpass the qualities of the product or process specified. Accordingly proprietary names wherever mentioned in the Specification, Schedule of Rates or on the drawings shall be deemed to mean the provision of the named product or process or an approved alternative.

Equivalence of the standards of any alternative product shall be verified by independent certification upon the Engineer's Representative (ER) request.

3.15 Programme

The tenderer is to provide a detailed construction programme with the Works Proposals accompanying the tender submission. The programme shall be in a bar chart format and include:

- Holidays / non-working days.
- Work sequencing
- Critical path
- Start / Substantial Completion / Milestone dates.
- Required programme contingency of Site Working Days as called for in Schedule part 1 to the Conditions of Contract.

The Contractor shall in all events ensure that the works are programmed, supervised and carried out in a way to minimise the risk of accidental interruption to live services.

3.16 Training of Employer's staff

Before Substantial Completion, or at a date thereafter agreed before Substantial Completion with the ER, explain and demonstrate to the Employer's maintenance staff the purpose, function and operation of the installations including all items and procedures listed in the Building Manual. Include for not less than operating days for this purpose. The Contractor shall ensure that full instruction to the Employer's staff is given to at least 3 nr individuals and is signed off as having been received.

3.17 Covid-19 Measures

The Contractor shall comply in full with relevant legislation and regulations made thereunder, Government public Facility guidance and Public Health Measures related to the COVID-19 pandemic and current at the Designated Date for the project. 'Government public Facility guidance' shall include relevant material public Facility by its agencies and in particular the Health and Safety Authority and the Health Services Executive.

The Contractor is advised to take into account the Construction Industry Federation's Standard Operating Procedures issued with respect to the COVID-19 Pandemic.

The Designated Date shall be the date 10 days before the last day for receipt of the Contractor's tender for the Works.

The Contract Sum will be deemed to include for the implementation of all measures - including hygiene, access management, materials procurement and delivery, work sequencing and work practices - required to construct the work safely and to minimise the risk of disease contagion for the Contractor's Personnel, the Employer's Representative, Employer's Personnel and third parties visiting the site.

4. BUILDING CONTROL REGULATIONS AND SPECIALIST WORKS CERTIFICATION

4.1 Building Regulation Compliance

The Contractor's shall execute the works in full compliance with B(C) AR - Building Control Regulations. The Contractor's tender is deemed to include all costs associated with his duties and obligations in this regard. There shall be no Local Authority involvement. All submissions shall be made to the party designated by the Director of Engineering.

4.2 Electrical Subsystems Certification

All electrical sub-systems shall be certified as having been carried out in compliance with the requirements of the ETCI Wiring Regulations.

Copies of the ETCI Subsystems certificates, accompanied by the relevant test results, shall be included with the ETCI Completion Certificate in the Health and Safety File for the project.

In the event of the Contractor failing to secure Subsystem certificates for all items of equipment, then the Contractor shall be liable for the cost of having the systems tested, remedied as necessary and certified. The tender figure shall be deemed to include for all costs incurred by the Contractor in providing the appropriate documentation.

4.3 Fire Certification and Marking

The Contractor shall, immediately prior to Substantial Completion, certify that the construction work carried out on the contract by him and his workers has been carried out in such a way as to ensure that the integrity of the fire zones within the building has been maintained. That all fire barriers, control elements, coatings and alarm systems have been provided and installed in compliance with the relevant Standards.

All fire resistant coatings such as intumescent paints shall be clearly identified with an engraved plate identifying the designed fire rating and specifying that no paint or other decorative coatings shall be applied to the coating without the prior agreement of the person with maintenance responsibility for the building. The locations for the plates shall be instructed by the ER.

All fire rated door-sets with non-metallic leaves shall be permanently identified in accordance with the requirements of BS 8214:1990 identifying the period of fire resistance, the manufacturer's name and address, the year of manufacture and other pertinent details.

These details shall be engraved on a metal plate, fire resistant to 800°C, which shall be fixed to the hinge stile of the door leaf near the top edge and shall be clearly legible. Every fire door (i.e. the complete fire door assembly) shall be supported by a fire test report from an accredited laboratory (see Technical Guidance Document D of the Building Regulations) that indicates that the complete assembly will meet the required performance.

5 TAXATION

5.1 Value Added Tax

The tender shall be submitted on the basis that the tender amount includes all VAT that the Employer will be obliged to pay to the Contractor. Any VAT to be paid directly to the Revenue Commissioners in accordance with the Reverse Charge VAT Regulations shall be excluded. Tenderers shall list separately the items included in the tender amount that are liable for VAT at rates other than the special building rate (13.5%) to allow for the calculation of the Employer's total VAT outlay on the contract. The Employer reserves the right to seek advice from the Revenue Commissioners on the accuracy of the VAT allocations shown and, in the event of a dispute, the opinion of the Revenue Commissioners on the VAT rate appropriate to any item of work shall be final.

During the Contract, payment amounts due to the Contractor shall be invoiced on the following basis:

- a. The amount due to the Contractor that carries a VAT liability of 13.5% shall be invoiced separately from any other amounts due. This invoice shall be clearly marked with the statement 'VAT ON THIS SUPPLY TO BE ACCOUNTED FOR BY THE PRINCIPAL CONTRACTOR'
- b. Amounts due to the Contractor that carry no VAT liability, or are liable at rates other than 13.5%, shall be invoiced on a second invoice that identifies amounts due at the various VAT rates (apart from 13.5%), identifies the VAT due at the various rates and states the total amount due for payment.

Applications for payment and valuations of Compensation Events shall identify the items of work that carry a VAT liability at rates other than 13.5%, stating the rate applicable. Where the cost of any items are VAT exempt or zero rated for VAT purposes the relevant items shall be itemised and the amount of the liability at this rate shall be clearly identified. In the event of a VAT liability arising for the Department on work or services provided by a party not registered for VAT in the Republic of Ireland. The invoices shall be submitted on a VAT exclusive basis and clearly marked to show that all VAT due on the supply will be returned by the Department directly to the Revenue Commissioners. Nonetheless, the Contractor will be required to provide all information required for the calculation of the VAT liability.

The tender shall include for Value Added Tax liability at the Standard (23%) rate only. No amount shall be included for the VAT liability at the special building rate (13.5%). Where the work is liable at various rates, the Contractor shall provide a detailed breakdown of the items of work liable at 23% and or 0% / exempt to facilitate the valuation of Change Orders. Where the cost of any items are zero rated / exempt for VAT purposes, the relevant items shall be itemised and the amount of the liability at this rate shall be clearly identified on the tender summary, with the amount carrying the zero rated / exempt liability kept separate in the compilation of the total tender price.

5.2 Tax Clearance Certification

The award of the Contract will be conditional on the selected tenderer being in a position to produce a valid 'Subcontractor's Notification of Determination' issued by the Revenue Commissioners' eRCT system. The Notice shall be not more than 30 days old on the date that the tenderer provides it to the Employer. Where the 'Notice' states that tax is to be deducted from the tenderer at the rate of 35% then the tenderer shall be deemed unacceptable for the award of the Contract and his tender shall be deemed invalid. A tenderer asked to produce a 'Notice' shall be allowed ten working days to do so after which, should he have failed to do so, he may be deemed to have withdrawn his tender. The tenderer shall be responsible for all costs incurred by him in obtaining a 'Subcontractor's Notice of Determination'. The Employer is obliged to withhold tax from the Contractor in accordance with the instructions of the Revenue Commissioners at the rate determined by them as appropriate for the Contractor at the time any payment is due to be made.

In addition to the Notice referred to above, a copy of the tenderer's Tax Clearance Certificate will also be required.

6. DEFINITIONS AND EXPLANATIONS

6.1 ER

The Employer's Representative, as per the Conditions of Contract and the Schedule thereto.

6.2 The Works

The term 'the works' shall mean the whole of the works intended to be executed under this Contract including all work by local authorities and statutory undertakings, unless expressly stated to the contrary.

6.3 Re-Use from Store

The term 're-use from store' shall be deemed to include for sorting through stored items, selecting suitable items, cleaning, packing or wrapping to prevent damage and transporting to the location of their incorporation in the Works and removing any protective covering.

6.4 Store for Re-Use

The term 'store for re-use' shall be deemed to include for taking down items, carefully removing from their existing location to prevent damage, packing or protecting as necessary, loading, moving to a suitable store and protecting; the selection of items for re-use and associated work will be included elsewhere.

6.5 Plugging

The term 'plugging' shall mean the provision and fixing of hardwood or other approved proprietary plugs. For locations where nailed fixings are required the Contractor may use a cartridge operated fixing gun or other approved mechanical fixing method. Under no circumstances must softwood plugs be used. Care shall be taken when fixing plugs to reinforced concrete to avoid damaging the reinforcement.

6.6 Change

A Change shall be deemed to be an alteration arising from an ER's instructions during the course of the Works about the extent or quality of the Works called for in the Works Requirements.

6.7 Abbreviations

The following abbreviations have been used in the Preambles and descriptions of items in the Works

Requirements:

sm - square metre

smm - square millimetre

cm - cubic metre

cmm - cubic millimetre

g - gramme

kg - kilogramme

t - tonne

N - Newton

kN - kilo Newton
lt - litre

swg - standard wire gauge
SR - Irish Standard Recommendation
BS - British Standard Specification
BSCP - British Standard Code of Practice
exc - exceeding
ne - not exceeding
i.e. - included elsewhere
m - metre
fs - Facility size mm - millimetre
Nr. - number
C - degree Celsius

Units of measurement have been abbreviated as follows:

m - metre	m ³ -cubic metre
m ² - square metre	nr -number
nr - number	kg -kilogrammes
hr - hour	

6.8 Euro norms, Irish Standards, British Standards and British Standard Codes of Practice

All European, Irish and British Standards and Codes of Practice used refer to the current metric version of such standards or codes except where metric standards or codes have not yet been introduced. The version of each code or standard applicable on the designated date for the Contract will be the version applicable.

6.9 Supply Only

The term 'supply only' shall be deemed to include the cost of supplying the materials and goods, their delivery to site, unloading, storing, returning packages carriage paid and obtaining any credits therefore.

6.10 Fix

The term fix shall be deemed to include for the supply as well as the fixing of the item mentioned.

6.11 Fix Only

The term 'fix only' is defined as the fixing of materials and goods where the materials and goods are either supplied to the Contractor free of charge by the Employer or where the supply of the items is dealt with elsewhere in the Specification document included with the Works Requirements. In addition to fixing the materials and / or goods, the Contractor will be deemed to have included for taking delivery of the items and safeguarding them. all handling required

to get the items to the location of their incorporation in the Works, in accordance with the specific instructions (where provided) for the items and best industry practice. Protecting them and disposing of any waste except where unused materials is specified as being returned to the Employer in which case the surplus shall be returned to the Employer at the earliest possible opportunity.

6.12 Timber Sizes

All joinery and timber sizes quoted in this document are finished facility sizes unless otherwise stated.

APPENDIX A

SAFETY DOCUMENTATION REQUIRED FROM CONTRACTOR TO BE SUBMITTED PRIOR TO COMMENCEMENT OF WORK ON SITE

- a. Identification of hazards associated with the work to which the tender relates including working from heights, excavations, fire, access and egress, etc.
- b. Assessment of the risks associated with the hazards listed and the prevention and control measures to be implemented to combat these risks.
- c. Training to be provided to staff to deal with the risks identified.

APPENDIX B

TYPICAL INFORMATION REQUIRED TO BE HANDED OVER TO THE EMPLOYER'S REPRESENTATIVE ON COMPLETION OF THE PROJECT AND TO BE MADE AVAILABLE TO THE PSDP TO ALLOW COMPILATION OF THE SAFETY FILE

- a. Identification of and locations of all potentially hazardous materials (eg certain insulation materials, two pack and other special paint coatings) and installations and the procedures to be followed in order to minimise the associated risks:
 - i) in the daily use of the building or structure
 - ii) when maintenance, repair, refurbishment or replacement of the materials or installations is to be undertaken.
- b. Marked up construction drawings showing how the work was-built where it differs from the requirements shown on the drawings issued to the Contractor. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.
- c. Specifications and details of pipe and cable run layouts and fixed systems. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.
- d. Details of fixed equipment and systems including charts and manuals specifying the operating procedures and maintenance requirements and procedures.
- e. Test and commissioning certificates for mechanical and electrical installations installed or altered as part of the Works.
- f. Design criteria, where design work formed part of the Contract, for structural elements and for electrical and mechanical systems.

Details of existing services and utilities encountered - either underground or in buildings - during the course of the Works, stating their location and describing them.

SECTION B

MATERIAL AND WORKMANSHIP GENERAL SPECIFICATIONS

CONTENTS

1. Demolitions
2. Excavations
3. Underpinning & Granular Fill Materials
4. Concrete
5. Structural Steel
6. Blockwork
7. Structural Timber
8. Woodwork
9. Cladding
10. Watermain
11. Manhole Covers and Frames
12. Paving
13. Plaster and Plasterboard
14. M&E
15. Floor, Wall and Ceiling Finishes
16. Painting and Decorating
17. Drainage

1. DEMOLITIONS

1.1 GENERAL REQUIREMENTS

Demolition work shall be carried out in accordance with British Standard Code of Practice B.S. 6187: 2000 Demolition. Notwithstanding the provisions of this Code of Practice, the work shall be carried out in accordance with all Statutory requirements, including those of the Dangerous Buildings Section of the Local Authority and the Health & Safety Directive EC No. 276 : 1993: Protection of Workers Exposed to Asbestos.

The order and method of each operation is to be submitted to the Employers Representative for approval prior to commencement. This is to include proposed methods of propping, shoring, protection of adjoining areas. Notwithstanding any information given in the Contract Documents, the onus shall be on the Contractor to visit the site of the works and satisfy himself as to the nature and extent of the work and all other matters that might influence his price or time for completion of the works.

The Contractor shall be deemed to have examined the existing structures on the site and to have acquainted himself with such matters as may affect the proposed demolition and the conditions under which they have to be executed. In particular the Contractor shall take cognisance of the proximity of existing buildings on the site and properties adjacent to the site as well as adjoining boundary structures, Main Square and road network.

1.2 ORDER AND EXECUTION OF WORKS

The order of demolition, the manner of execution of work, as well as the temporary storage on site and subsequent removal of debris from site shall be agreed with the Employers Representative prior to the commencement of any demolition work.

1.3 TAKING DOWN

All taking down shall be done in the most careful manner and is to cause as little inconvenience as possible. The Contractor shall be held responsible for any claim which may arise due to negligence or lack of adequate precautions on his part.

1.4 CONCRETE SLABS/FLOORS

Prior to the demolition of any portion of a concrete slab, the slab shall be examined by the Contractor in conjunction with the Employers Representative to determine the form of construction and the extent and sequence of propping and demolition shall be agreed. If required small trial holes shall be cut out to determine the direction of the main reinforcement. The method to be used for breaking out the slab shall be agreed with the Employers Representative.

1.5 DEMOLITIONS REQUIRED TO COMPLETE THE WORKS

Carry out all demolitions in accordance with the requirements of BSCP94. Tenderers must visit the site to ascertain the extent of the demolitions and alterations, the conditions under which they will be done and the nature of the structure being worked upon. Tenders will be deemed to include for all factors affecting the work. All debris associated with the demolition work is to be removed off site at the contractor's expense. All structural members to remain are to be protected during the works.

1.6 PROTECTION TO THE STRUCTURE DURING THE WORKS

Provide protection to the windows while work is been carried out. Any protection shall be agreed with the Employer's Representative prior to the works been undertaken. The Contractor shall be responsible for any damages to the structure during the course of the work.

1.7 SURROUNDING PROPERTY

Should any loss, damage or injury occur to roads, underground services or surrounding property from the carrying out of the works, make good same at his own cost to the entire satisfaction of the

Employers Representative and any other parties concerned and shall indemnify the Employer against any claims which may arise in consequence of such damage or injury.

1.8 SAFETY

All work shall be performed in such a manner as to ensure the safety of the work and the public. Demolition work to be carried out in such a manner as to cause the minimum inconvenience to the public and to adjoining military properties/buildings. All necessary precautions to be taken to minimise nuisance arising from demolition work. Submit proposals for carrying out the works in a safe manner and these shall be agreed prior to commencing any works on site.

1.9 SUPERVISION

Demolition work to be carried out under the supervision of a responsible person experienced in demolition work who shall ensure that adequate safety precautions are taken at all times, and that all necessary statutory regulations are fully adhered to.

1.10 BURNING

The burning of on-site materials arising from demolition is prohibited under *Air Pollution Act 1987*, S.I. No. 180 of 2011 *Air Quality Standards Regulations 2011*, and S.I. No. 2086 of 2009 *Waste Management (Prohibition of Waste Disposal by Burning) Regulations 2009*.

1.11 DUST

All debris derived from the demolition must be wetted at frequent intervals to prevent dust arising. Debris shall not be permitted to accumulate on site and must be taken away and deposited in a suitable dump by the Contractor at the earliest possible time.

1.12 NUISANCE

Take the necessary precautions to minimise nuisance arising from demolition work. See noise threshold level in General Requirement Section A.

1.13 PROTECTION

All reasonable precautions shall be taken to protect adjoining work from damage during demolition work and temporary screens and coverings to be provided as required. Adjacent structures shall be protected from damage and shall be provided with adequate support at each stage of demolition. Do not disturb adjoining structures or their foundations.

1.14 TEMPORARY SUPPORT

During demolition, any walls which are to be left in place for any period of time before demolition, and which have had their supporting roof removed, are to be adequately braced until demolition occurs. Contractor shall provide and maintain all necessary temporary support work. The Contractor shall be responsible for the design of all such temporary support work.

1.15 OVERLOADING BOUNDARY/PARTY WALLS/STRUCTUREAL

All surrounding boundary/party/basement/structural walls are to be protected against overloading or accidental damage during demolition. The use of heavy equipment close to the retained party / boundary/basement walls is to be restricted to ensure that none of these walls are overstressed during demolition. The walls adjoining the adjacent rooms are to be removed very carefully assuring no distress is caused to these adjoining room. Contractor shall ensure in particular that existing walls are not overstressed during the demolition operation and that no distress is caused to adjoining walls or the existing foundations arising from those operations.

Before starting demolition work, disconnect any services adjacent to that part of the area scheduled for demolition. Pay all charges for disconnection of services. Remove any tanks and pipes which may have contained inflammable liquids and gases in accordance with B.S.6187: 2000. Retain and maintain existing services where servicing adjoining or adjacent properties.

1.16 WORKMANSHIP DEFECTS

Notify the ER of any apparent structural defects or decay uncovered before or during demolition work in parts of the structures to be retained.

1.17 NEGLIGENT WORK

The Contractor shall be responsible for the repair of any damage caused by his own negligence and no payment shall be made by the Employer to the Contractor for rectifying any such damage.

1.18 CONSTRUCTION AND DEMOLITION WASTE

The construction and demolition waste from the projects shall be recycled in accordance with 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects' published in 2009 by DOECLG. All waste disposal shall be in accordance with the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003.

Only licensed hauliers and licensed landfill sites are to be used. Materials and debris arising from site clearance and demolition work shall become the property of the Contractor unless so otherwise specified. Remove from site debris and other materials arising from demolition. Construction and Demolition Waste shall be disposed of in accordance with EPA and Local Authority guidelines.

The Contractor shall not transport waste to or from the site or transport waste for disposal or recovery without a valid waste collection permit unless the particular activity or the waste quantity does not require a permit.

The requirement for a collection permit includes transporting surplus rubble/fill/spoil from the site if the material is going for disposal or recovery at a licensed facility. If the Contractor does not hold a waste collection permit, then a licensed waste collector must be employed to remove any waste from the site.

2. EXCAVATIONS

2.1 EXCAVATION

All excavation shall be made to the depths and dimensions shown on the drawings or as the Employer's Representative may direct. The Contractor shall include for reasonable care while excavating for foundations, in particular, at those points adjacent to neighbouring structures. The Contractor shall not be allowed any variation in respect to excavations to be carried out by hand. Should the dimensions of any excavation exceed those shown on the drawings or ordered by the Employer's Representative, the Contractor shall at his own expense fill such extra space with foundation concrete as hereafter described. The Employer's Representative on site must confirm the level of all excavations.

2.2 EXCAVATIONS ADJACENT TO EXISTING FOUNDATIONS

Prior to commencing excavations, the Contractor shall excavate trial pits adjacent to existing foundations to determine extent and formation levels. Allow for inspection of trial pits by the Employer's Representative. Allow time for amendment of details if required.

2.3 BLASTING

Blasting will not be allowed without written permission from the Employer's Representative, who must be fully informed by the Contractor as to steps taken to safeguard the surrounding property and the Contractor, must take all responsibility.

2.4 PLANKING AND STRUTTING

The description "planking and strutting" shall mean that the Contractor shall take all necessary precautions to ensure the stability of the sides of the excavations.

2.5 OVER EXCAVATION

The Contractor shall take account of all risks of collapse and shall pay for any extra excavations beyond the nett sizes necessary. The Contractor shall also pay for subsequent returning, filling and ramming in concrete to a foundation mix if the Employer's Representative so decides.

2.6 EXCAVATIONS FREE FROM WATER

The excavations shall be kept free from general water at all times and all mud and slurry shall be removed to present a fully undisturbed dry surface on which to apply the foundation concrete. The position of sumps and manner of pumping shall be subject to the approval of the Employer's Representative.

2.7 INSPECTION OF TRENCHES

The Contractor shall notify the Employer's Representative as soon as the trenches are excavated, and no concrete is to be poured until the Employer's Representative has examined the trenches and approved same.

2.8 CART AWAY

All surplus spoil shall be carted off site to a tip provided by the Contractor who shall pay all charges in connection therewith.

2.9 OBSTRUCTION

Any obstruction at or below formation level shall be reported to the Employer's Representative and shall be dealt with as directed by him.

2.10 FORMATION TO STRIP FOUNDATIONS

To minimise moisture softening, the formation shall be exposed for as short a time as possible. The last 50mm of excavation shall not be taken out until concreting is almost ready to start. The formation shall be lightly rammed. Before any concrete is placed, the Contractor shall call on the Employer's Representative or his representatives to inspect the formation.

2.11 PUMPING

The Contractor shall provide all equipment and other works necessary to keep the excavation free of water and to prevent the direct access of water to the formation. Excavation shall be so arranged that any water entering the cut is immediately drained away to a sump or other point from which it can be pumped or otherwise disposed of. Before any pumping takes place, the approval of the Employer's Representative shall be sought, but this approval will not absolve the Contractor from his responsibilities for the safety of the works. If the Contractor pumps or otherwise puts water into a drain, he shall be responsible for seeking all permission and for removing from the system all deposits caused thereby.

2.12 UNSTABLE GROUND

The Contractor shall ensure that the excavation remains stable at all times. Give notice to the Employer's Representative without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted. If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

2.13 FOUNDATIONS IN MADE-UP GROUND

The Contractor shall excavate down to a natural formation or undisturbed subsoil. Give notice to the Employer's Representative if this is greater or less than the depth provided on the Engineering drawings.

2.14 UNRECORDED FEATURES

The Contractor shall give notice if unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc., not shown on the drawings are encountered.

3. UNDERPINNING AND GRANULAR FILL MATERIALS

3.1 GENERALLY

The underpinning of the foundations to existing structures is to be carried out in such a manner as to cause the least possible disturbance to the existing foundation/structure.

Underpinning work is to be carried out in overall sections not exceeding 6m in length. The existing foundations are to be exposed and then underpinned in 1m long excavations. These excavations are to be exposed and underpinned in an alternate manner, (i.e.) no two adjacent 1m long parts of the foundation are to be exposed and underpinned in succession. Each section of work must be fully complete to the Engineer's satisfaction before the next section is to be opened up.

3.2 PLACING

Underpinning concrete is to be placed simultaneously with the concrete for the foundation to the new building/structure. Methods of shuttering and placing this concrete shall be agreed with the Employer's Representative prior to any work being carried out.

Generally concrete underpinning shall be carried to within 50mm of the underside of the existing foundation, then left to set and shrink, then fine dry concrete shall be rammed in to make full contact with the old and new work. Reinforcement for each section shall protrude and be bent sideways so that it can then be bent back and extend into the next section. The bearing stratum below the underpinning is to be inspected by and approved by the Engineer in writing prior to placing of any concrete.

The Contractor must provide all the requisite shoring, needling and strutting and other supports to walls, roofs etc., to ensure the protection of existing buildings. He will be held solely responsible for the safety of the existing buildings and the sufficiency of all temporary work.

3.3 PROPOSED FILL MATERIALS

All hardcore should conform to I.S. EN 13242: 2002 + A1:2007 and meet the specification as outlined in Annex E of the accompanying guidance document to Technical Guidance Document C, i.e. S.R. 21:2014 + A1:2016.

S.R. 21:2014+A1:2016 Annex E: Guidance for Specifying Aggregates for Unbound Granular Fill (Hardcore) for Use Under Concrete Floors and Footpaths.

The Contractor shall submit full details of the proposed fill materials to demonstrate compliance with the specification, including: Type and source of imported fill; Proposals for processing of material excavated on site and Test reports;

3.4 HAZARDOUS, AGGRESSIVE OF UNSTABLE MATERIALS

The Contractor shall not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structure or instability in the filling, including material that it is:

- Frozen or containing ice;
- Organic;
- Contaminated or noxious;
- Susceptible to spontaneous combustion;
- Likely to erode or decay and cause voids;
- Clay;

Fill materials shall be free from all types of pyrites, sulphides and muscovite/mica.

3.5 LIMITATION OF SULPHATE CONTENT IN FILL MATERIALS

Specific guidance is given in section 3.3 and Annex E of S.R. 21:2014 + A1:2016 on limiting the presence of a reactive form of pyrite which may give rise to swelling or sulphate attack on concrete.

The Contractor shall provide Certificates of Test Results for Water Soluble Sulphate, Total Potential Sulphate and Oxidizable Sulphides, to demonstrate compliance with S.R. 21:2004 + A1:2007.

The finished aggregate product should be tested initially and quarterly to determine the total sulphur content, in accordance with I.S. EN 1744-1, on a representative sub-sample of the bulk hardcore.

- Where $S > 1\%$, the material is not suitable for use as unbound granular fill (hardcore) for use under concrete floors or footpaths.
- Where $S < 0.1\%$ the material is suitable for use as unbound granular fill (hardcore) for use under concrete floors or footpaths.
- Where $S > 0.1\%$ and $< 1\%$ the material should be further evaluated to determine if it is suitable for use as unbound granular fill (hardcore) for use under concrete floors or footpaths.

3.6 PLACING FILL

Surfaces of excavations and areas to be filled shall be dry and hard, and free of loose soil, topsoil, organic material, rubbish and standing water. Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.

Place fill material so that only one type of material occurs in each layer. The Contractor shall vary the route of earthmoving equipment to avoid rutting.

3.7 COMPACTION

Compact fill as soon as possible after placing. After compaction, the surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like. Remove any defective areas and recompact to full thickness using layer of new material.

3.8 HARDCORE FILLING

Hardcore fill shall be granular material, free from excessive dust, well graded, with all pieces less than 75mm in any direction. The material shall be as specified on the Engineering Drawings, and in any one layer shall be only one of the following:

- Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together;
- Crushed concrete, crushed brick or tile, free from plaster, timber and metal;
- Crushed non-expansive slag;
- Gravel with not more clay content than is required to bind the material together, and with no large lumps of clay;
- Natural gravel;
- Natural sand;

The filling shall be spread and levelled in 150mm maximum layers.

Where filling is to be provided below ground floor slabs of building, all vegetable soil shall be removed. Filling is to be applied only when the formation level is free of mud and slurry, the formation level shall be left exposed for as short a time as possible after removing the vegetable soil. The formation level shall be lightly rammed and generally levelled before filling commences. Filling shall consist of hard dry material as described on the Engineering drawings. The filling shall be deposited in layers not exceeding 150mm and shall be at a moisture content of not exceeding 5%. Each layer shall be compacted to the satisfaction of the Engineer with approved mechanical equipment.

3.9 MATERIALS

The hardcore bed should be at least 150 mm thick. Hardcore should conform with I.S. EN 13242: 2002 + A1:2007 and meet the specification as outlined in Annex E of the accompanying guidance document to Technical Guidance Document C, i.e. S.R. 21:2014 + A1:2016. The layer of hardcore shall be well compacted, clean and free from matter liable to cause damage to the concrete. Specific guidance is given in section 3.3 and Annex E of S.R. 21:2014 + A1:2016 on limiting the presence of a reactive form of pyrite which may give rise to swelling or sulphate attack on concrete.

A blinding layer should be provided in accordance with the specification given in Annex E, of S.R. 21: 2014 + A1: 2016, for fines material. The blinding layer should be of adequate depth to fill surface voids thus creating an even surface and avoiding sharp projections, which may damage radon or dampproof membranes.

3.10 SPECIFICATION FOR ROADWORKS

Hardcore material shall generally comply with the requirements of TII Publications: Specifications for Road Works Series 600 – Earthwork (including Erratum No. 1, dated June 2013) CCSPW- 00600 March 2013 CC (Construction & Commissioning) Standards, and Specifications for Road Works Series 800 – Road Pavements – Unbound and Cement Bound Mixtures CC-SPW-00800 March 2013 CC (Construction & Commissioning) Standards.

Designations of typical materials are provided below (refer to Engineering drawings for specific materials used in this project):

3.11 GRANULAR MATERIAL TYPE A

Type A granular material shall be gravel, crushed rock, or recycled crushed mixed concrete aggregates as defined in Annex A of I.S. EN 13285 (including recycled coarse aggregate complying with Clause 801.3).

3.12 GRANULAR MATERIAL TYPE B

Type B granular material shall be crushed rock. The mixture shall comply with Clause 801 and the subclauses of 804. The overall grading requirements for the mixture are summarised in Table 8/6 (Series 800). Clause 808 states that all unbound mixtures deposited within 500mm (or any other distances described in Appendix 7/1) of cement bound materials, concrete pavements, concrete structures or concrete products forming part of the Works shall be Type B granular material complying with Clause 804.

3.13 6N (SELECTED GRANULAR FILL)

Selected Granular Fill (fill to structures, backfilling, etc.) complying with Table 6/1 and graded to Table 6/2 of Series 600.

3.13 6F CAPPING

Selected Granular Fill (Capping) to comprise of Class 6F material in accordance with TII-CC-SPW-00600 Clause 613 and compacted in accordance with Clause 612.

3.14 OVERALL GRADING

The grading requirements for commonly used Road Works and Earthworks materials are provided below. Refer to specific requirements in 800 and 600 Series, respectively.

Sieve Aperture (ISO Series)	% By Mass Passing Sieve		Sieve Aperture (BS Series)	% By Mass Passing Sieve	
	Type A (803)	Type B (804)		6N	6F
			100mm	100	100
63mm	100	100	75mm	65-100	65-100
31.5mm	80-99	80-99	37.5mm	45-100	45-100
16mm	55-85	55-85	20mm		
8mm	35-68	35-65	16mm		
4mm	22-60	22-50	10mm	15-75	15-80
2mm	16-47	15-40	5mm	10-60	10-70
1mm	9-40	10-35	2mm		
0.5mm	5-35	0-20	0.600mm	0-30	0-30
0.063mm	0-7	0-7	0.063mm	0-15	

3.15 UNBOUND GRANULAR FILL

The table below presents the Unbound Granular Fill covered by S.R. 21 Annex E with typical depths shown for a typical build-up for fill under a concrete floor slab. This is for guidance purposes only.

The Contractor should refer to specific information on the Engineering drawings for the project.

Finished Floor Level		
Concrete Floor Slab Build-Up		
----- Radon Barrier -----		
Typically 50mm Deep	T.3 Blinding	Fine aggregate (0/4mm) GF 80, for blinding the top surface of the T.2 Permeable material.
200mm layer (50mm to 250mm below Radon Barrier)	T.2 Permeable	Suitably graded unbound granular fill material (4/40mm) to facilitate the free movement of radon gas within the hardcore area.
Depths between 250mm and 900mm below Radon Barrier, deeper if required by site conditions	T.1 Structural	Structural unbound granular fill material all-in graded aggregate (0-32mm) or gravel (0/40mm) to facilitate placing and compatibility.
Depths greater than 900mm below Radon Barrier	T.0 Structural	Suitably graded structural unbound granular fill material (0/125mm), for use at depths greater than 900mm below the radon barrier/damp proof membrane.

4. CONCRETE

4.1 GENERAL

The cement shall be medium setting artificial cement, manufactured in Ireland, and shall comply with the Irish Standard Specification Portland Cement No. IS EN 197-1. The cement shall be delivered on the site in packages with unbroken seal affixed by the manufacturer. The cement shall be stored in such a manner that it will be efficiently protected from moisture.

4.2 SAND AND GRAVEL

The sand shall be gritty and clean, free from clay, organic or other impurity. It shall be graded mixture of coarse and fine grains, and shall be capable of passing through a sieve of one eighth of a square inch mesh. Should the Employer's Representative consider the sand is not clean and free from impurities when it is delivered to the works, he shall have power to order it to be washed in a manner approved by him. No sea sand is to be used. The coarse aggregate may be either clean crushed hard stones or clean gravel, free from dirt and impurities. In either case, it shall be coarser than 5mm and shall be graded from this size to a maximum of either 18mm or 38mm as specified for the different classes of concrete which follows. The coarse aggregate shall be graded between these sizes to the satisfaction of the Employer's Representative, and each particle must be sound and strong. All or part of the coarse aggregate shall be washed if the Employer's Representative decides it is necessary. Aggregates shall comply with BS 882.

4.3 CONCRETE

The structural elements of the Contract have been designed in accordance with current relevant Irish and British Standard Codes of Practice.

4.4 MATERIALS

All materials shall comply in all respects with the requirements of the appropriate Irish or British Standard.

Methods for specifying concrete	IS EN 206
Ordinary Portland cement	I.S. 1
Aggregates	IS EN 13242

4.5 READY MIXED CONCRETE

Ready mixed concrete may be used, subject to approval. The concrete shall comply with BS 1926, except where stated in the specification. All delivery notes shall be retained by the Contractor and made available for inspection throughout the duration of the contract. One copy shall be issued to the Employer's Representative. All the constituents for each mix shall be added at the manufacturer's depot. No extra water or other materials shall be added after the concrete has left the depot.

The total amount of soluble salts in the concrete from the aggregate water and admixtures shall not exceed the recommended values of BS 8110. Each delivery of ready mix concrete must be accompanied with a docket containing the following information:-

1. Name of Ready-Mix Plant.
2. Serial number of docket.
3. Date.
4. Delivery truck number.
5. Name of purchaser and contract.
6. Grade of concrete.
7. Workability.
8. Maximum aggregate size.
9. Time of loading at plant.

4.6 AGGREGATE

General: Aggregate shall comply with IS EN 13242 unless otherwise specified.

Aggregates shall be stored on hard paved self-draining areas or in approved hoppers or containers. Different aggregates shall be kept separate.

4.7 WATER

Water shall be clean and free from harmful matter. If water for the Works is not available from a Public Utility undertaking supply, approval shall be obtained regarding the source of supply and manner of its use. When so directed, arrange for tests of the water to be carried out in accordance with BS EN 1008:2002.

4.8 CONCRETE MIXES

Concrete Mixes: Designed mixes shall be used for each grade of concrete listed in Table 1 and shall be in accordance with 6.5.1 and 6.5.2 of BS 8110 except that the Contractor shall obtain approval for any change in sources of material and change in cement content which results in a difference greater than 20 Kg/M³ from the cement content last approved. Trial Mixes: Results of all preliminary tests shall be submitted as soon as they are available and before concrete work starts on site. Re-determination of Mix Proportions: Mix proportions may be adjusted in accordance with 6.7.6 of BS 8110, but changes of current margin shall be subject to approval.

4.9 CLASSIFICATION OF CONCRETE MIXES

Where the concrete mix is designated by the Employers Representative as a "designed" mix the Contractor will be responsible for selecting the mix proportions to achieve the required strength and workability but will ensure that the minimum cement content is adhered to.

DESIGNED CONCRETE MIXES – Table 1

Concrete Grade	Characteristic Compressive Strength at 28 days N/mm ²	Minimum Cement content Kg/m ³	Maximum size of Aggregate Mm	Slump Mm	Max Free water v Cement ratio	Location
15	15	210	20	75		Concrete blinding and mass concrete filling
20	20	280	20	50		Concrete bedding to pipes, manhole floors
20	20	360	30	50	0.65	Founds
30	30	360	20	25	0.65	
30	30	400	10	25	0.65	Topping screed
35	35	400	10	25	0.65	

4.10 MAXIMUM CEMENT CONTENT

Cement contents in excess of 550 kg/m³ shall not be used unless as instructed or allowed by the Employers Representative.

4.11 ADMIXTURES

Admixtures may be used in "special" structural concrete but only with the prior approval of the Employers Representative. Admixtures, unless specified will not be permitted in prescribed mixes. Calcium chloride and admixtures containing calcium chloride will not be permitted. Both the amount added and the method of use should be to the approval of the Employers Representative who will be provided with the following data:-

- (1) The typical dosage and the detrimental effects, if any, of under dosage and over dosage.
- (2) The chemical name(s) of the main active ingredient(s) in the admixture.

- (3) Whether or not the admixture contains chlorides and if so, the chloride on content expressed as a percentage by weight of admixture.
- (4) Whether or not the admixture leads to the entrainment of air when used at the Manufacturer's recommended dosage.

An admixture shall be specified as one that complies with the requirements of the following British Standards: B.S. 1014, B.S. 5075

4.12 MIXING

The quantity of cement, the quantity of fine aggregates and the quantities of the various sizes of coarse aggregate shall be measured by weight only. A separate weighing device shall be provided for weighing the cement. The amount of water shall be measured by volume or weight. Any solid admixtures to be added shall be measured by weight only, but liquid or paste admixtures shall be measured by volume or weight.

The batch weight of aggregates shall be adjusted for the moisture content of the aggregate being used. The quantity of water contained in the aggregates shall be determined by the Contractor in accordance with a method approved by the Employers Representative and the quantity of water to be added to the mix shall be reduced by the quantity of water contained in the aggregates being used.

The accuracy of all measuring equipment shall be within 3% of the quantity of cement, water or total aggregates being measured and within 5% of the quantity shall be maintained by the Contractor in a clear serviceable condition. The mixer shall comply with the requirements of B.S. 1305. The mixing time shall not be less than two minutes or the time necessary to ensure compliance with the required strength.

4.13 RECORDS

Keep a record of all concreting carried out on the Site. Record sheets shall be set out as follows:- Date, Time, Temperature, Volume, Position, Remarks. These record sheets shall be available for inspection by the Employers Representative at every Site Meeting or at any other occasion so required by the Employers Representative.

4.14 TEMPERATURE

Provide a permanent Site Thermometer and he shall record the temperature regularly. The minimum temperature at which concrete may be cast shall be:-

2°C on a rising thermometer or
3°C on a falling thermometer

Ensure that the temperature of the concrete is a minimum of 5°C at the time of placing. The maximum temperature at which concrete may be cast shall be 30°C.

4.15 TRANSPORTING OF CONCRETE

Transport concrete to avoid adulteration, segregation or loss of ingredients. The interval between mixing and placing shall be kept as short as possible. In all cases concrete should be finally placed within 30 minutes of discharge from mixer or from delivery vehicle. Concrete which has partially set shall not be placed in the work.

4.16 PLACING OF CONCRETE

The method of placing the concrete shall be of such that contamination, segregation or loss of the constituent materials does not occur. Before concrete placing commences all formwork and reinforcement contained in it shall be clean and free from standing water, snow or ice.

CONCRETE SHALL NOT BE PLACED IN ANY PART OF THE STRUCTURE UNTIL THE EMPLOYERS REPRESENTATIVE'S APPROVAL HAS BEEN OBTAINED.

If concreting has not started within 24 hours of approval been given, approval shall again be obtained from the Employers Representative.

The concrete while being placed shall be rammed, tamped, or mechanically vibrated to form a dense material with all surfaces free from honey-combing and other blemishes. The concrete shall be placed directly in its permanent position and shall not be worked along the shuttering to that position. Care must be taken to ensure that reinforcement is not displaced from its correct position during the placing of the concrete. Care shall also be taken to ensure that the reinforcement is fully surrounded by concrete, that no voids or cavities are left and that all steel shall have the minimum specified cover. A competent steel fixer shall be in attendance to correct any reinforcement displaced by the concrete operation.

4.17 VIBRATING OF CONCRETE

All concrete shall be compacted by means of high frequency internal vibrators of a type, size and number approved by the Employers Representative. The number of vibrators employed shall be ample to consolidate the incoming concrete to a proper degree within fifteen minutes after it is deposited in the forms. In all cases, at least two vibrators shall be available at the site of structures in which more than 20 cu. metres of concrete are to be placed (one on standby).

The vibrators shall not be attached to or held against the forms or the reinforcing steel. The location, manner and duration of the application of the vibrators shall be such as to achieve maximum consolidation of the concrete, freedom from voids and proper texture of exposed surfaces when the forms are removed. Fresh concrete shall be spread in horizontal layers in so far as practicable and the thickness of the layers shall not be greater than can satisfactorily be consolidated with the vibrators.

The use of vibrators for extensive shifting of the mass of fresh concrete deposited will not be permitted. Concrete shall be placed as near as possible to its final position. In no case shall concrete be over-vibrated.

4.18 SLUMP TEST EQUIPMENT

Provide a slump cone, tamping bar and base plate all in accordance with B.S.S. 1881 Part 102 and facilitate the Employers Representative in carrying out slump tests to determine the consistency of the concrete.

4.19 HOLES AND CHASES IN CONCRETE

Holes, chases and other openings required for the passage of pipes, conduits etc., shall be formed by inserting suitable sleeves, cones and sinkings before placing the concrete. The Subcontractors shall be required to furnish full information in regard to the position of bolts, clips and other fastenings. The cutting of chases, holes or other openings in the finished work shall not be permitted without the sanction of the Employers Representative. Such holes and chases shall be made only in approved locations and shall be cut with approved tools.

4.20 CONCRETE SCREEDS

Surfaces to receive screeds shall be cleaned off and free of debris, oil, grease and dust. For screeds less than 50mm thick the concrete surface shall be mechanically hacked to expose the aggregate, washed and brushed clean. Not less than 12 hours later any surplus water shall be removed and a cement and water grout brushed onto the surface just ahead of the application of the screed.

Where screeds are greater than 50mm thick it is not necessary to expose the aggregate but the same cleaning and grouting procedure should be followed. Where an un-bonded construction is required the screed shall be laid on an isolating membrane. Screeds with a nominal thickness greater than 40mm shall be laid in two layers with the lower layer thickest and neither more than 20mm thick. The upper layer shall be laid and compacted immediately after the one below.

Screeds to receive thin sheet or tile finishes shall generally be laid in room sized bays. The position of day joints, if required, shall be to the ER's approval. Screeds to receive in-situ, tile, slab or block finishing's or heating elements shall be laid in square bays not exceeding 15 square metres. At least 24 hours shall elapse between the laying of adjacent bays and bays should be laid to break joint.

Movement joints in the slab should be continued through the screed. Screeds shall be kept damp for seven days by covering with polythene sheet and no traffic should be allowed over the screed for that period. The screed shall then be allowed to dry out naturally without the use of artificial drying aids.

4.21 REINFORCEMENT

Cold worked high yield steel bars with a characteristic strength of 500 N/mm². Complying with the BS 4449.T: Bars to be deformed to conform to Type 1 of Appendix E of BS 8110. Cold worked deformed bars to Type 2 Appendix E of BS 8110 shall also be permitted.

Steel fabric shall comply with BS 4483 and shall be delivered to site in flat sheets.

4.22 CONCRETE BLOCKS

Concrete blocks shall be composed of 14mm concrete of limestone aggregate and cast in approved concrete block machines twenty-eight days before building into walls in 440x215x100, or other suitable sizes. If considered necessary, sample blocks may be taken for testing and if, after twenty eight days from manufacture, they do not withstand a 7N/mm² compression test, all blocks should be removed from the site and the cost of the test paid for by the Contractor. No block with broken arises or angles shall be used. The blocks shall comply with EU Construction Products Regulations 2013.

5. STRUCTURAL STEEL

5.1 Introduction

CE Marking of construction products covered by harmonised European Standards (including Structural Steelwork) is mandatory. The steel fabricator shall submit their CE marking certificate appropriate to the execution class.

This Specification shall be read in conjunction with the Engineering Drawings, Bills of Quantities/Pricing Document, all other Tender Documents, and the National Structural Steelwork Specification for Building Construction (BCSA Publication) 5th Version until July 2013 and thereafter, 5th Version (CE Marking Version).

All workmanship and materials shall be strictly in accordance with this Specification. Should the Steelwork Contractor wish to deviate from the Specification in any way, he shall agree such variations in writing. Similarly, any queries regarding this Specification shall be raised by the Steelwork Contractor prior to tendering. Thereafter, the successful Tenderer will be deemed to be familiar with all Clauses, and to have allowed for same in his tender. The works covered by this specification comprise of the supply, fabrication, delivery and erection of steelwork.

5.2 Workshop and Erection Drawings

The Steelwork Contractor is required to supply a fully dimensioned and detailed setting out plan together with elevations if required, showing the position of all holding down or fixing bolts to be placed by the Main Contractor. Details shall include provision for movement, protection and grouting requirements, which are to be provided by the Main Contractor.

5.3 Approvals

The structural steelwork Contractor shall prepare the necessary calculations for connections, and all detailed workshop drawings and shall submit for approval all such details in duplicate to the Engineer for checking. One copy of each drawing will be returned to the structural steelwork Contractor. The fabrication drawings must be prepared on Strucad software or equal approved.

The Steelwork Contractor shall not commence the fabrication of any part of the work until the Engineer has given his approval to the Steelwork Contractor's workshop drawings. Any fabricated steelwork which was not approved by the Engineer may be replaced, and if necessary, as directed by the Engineer, the Contractor shall bear all costs associated with same.

5.4 Accuracy of Dimensions

The Steelwork Contractor shall be deemed to have examined the drawings prior to commencing fabrication to satisfy himself as to the accuracy of dimensions and levels. Any discrepancies shall be reported to the Engineer who will issue the appropriate instructions. Such discrepancies shall be reported within 7 days of receipt of a drawing containing a discrepancy. The Steelwork Contractor will be responsible for checking and verifying the accuracy of site dimensions.

5.5 Horizontal Fixings to Concrete

Unless specifically noted on the drawings all connections of steelwork to vertical surfaces of concrete will be designed as pinned and the structural design of the concrete will take no account of bending moments from the steelwork end connections. Therefore any eccentricities of loading, which may arise from the end steelwork connection detail adopted by the Steelwork Contractor, must be allowed for in the design of the steelwork only, and the fixings to the concrete will be designed for vertical shear only.

Unless agreed in writing with the Engineer all fixings cast into concrete will be supplied by the Steelwork sub-Contractor and fixed by the Main Contractor.

Drilled fixings such as expansion anchors and chemical anchors shall be supplied, drilled and fixed by the Steelwork sub-Contractor. The size and type of horizontal fixings to concrete will be specified by the Engineer but the locations, level and setting out will be given on the Steelwork Contractor's drawings.

5.6 Connections

End Connection Details are shown on the Drawings. The Steelwork Contractor may propose alternative preferred connection details, subject to no variation in cost, which shall be subject to the approval in all cases of the Engineer. Connections are to be bolted or welded with adequate strength to withstand the loads and forces indicated on the drawings or contained in the design criteria.

In no case shall a combination of bolts and welding be used to share the load in the same connection without the written approval of the Engineer. Where details are not fully defined in the Specification or on the Drawings the Steelwork Contractor shall be responsible for such designs. The Steelwork Contractor shall submit for examination calculations and details of all connections.

No splices of any description shall be used in any member without the written approval of the Engineer's. All butt welding in tubes must include a suitable backing member. All site connections shall be bolted unless noted otherwise on the drawings. The structural steelwork Contractor shall arrange to have an adequate supply of electric power where site welding is necessary.

5.7 Quality of Materials

All materials shall comply with the relevant European Standards in all respects and are to be of good, sound and suitable quality to the satisfaction of the Engineer.

Hot Rolled Steel Sections shall comply in dimensions and tolerances with EN 10034 for all rolled steel sections except those hollow sections to which EN 10210-2 applies and equal and unequal angles to which I.S. EN 10056-1 applies.

Hot Rolled Steel Sections and plates shall comply with EN 10025.

Cold Formed Steel Sections shall comply with EN 10219-1:1997.

Crane Rails shall comply with EN 1993-6.

Non-Standard Steel Sections should be avoided but where they are used, they shall be designed in accordance with relevant Eurocodes and to the agreement of the Engineer. High Strength Friction Grip Bolts and Associated Nuts and Washers shall comply EN 14399 Parts 1-6

5.8 Steel Grade

Unless noted on the Contract Drawings all steel is to be Grade S275.

5.9 Freedom from Laminations

All rolled steel plates 16mm thick or over shall be guaranteed free from laminations and gross slag inclusions and shall comply with impact requirements where appropriate. The Steelwork Contractor's rates shall include for the cost of testing by ultrasonic or other approved methods. For all other steel sections, laminations shall be within the limits set in D.D. 21:1977.

5.10 Welding Electrodes

All electrodes for welding shall be the type recommended by the manufacturer for use in the position of deposition and the type of parent metal being welded.

5.11 Floor Plates

Unless noted on the Contract Drawings all floor plates shall be Durbar non-slip raised pattern floor plates. The plate thickness shall be measured exclusive of the pattern.

5.12 Standard of Workmanship

A high standard of workmanship and finish is required in accordance with normally acceptable good practice and the Steelwork Contractor must clearly understand that any work which is not, in the opinion of the Engineer, up to such standard will have to be taken down and made good or replaced with new at the Steelwork Contractor's expense.

5.13 Standard of Fabrication

In mild steel fabrication EN 10025 Grade S275 weldable structural mild steel shall be used and all steelwork, welding, bolts etc., shall comply fully with the latest metric editions. The steelwork shall be fabricated in accordance with EN 1993 Parts 1-6 and shall be supervised by a competent Engineer. As much fabrication as possible shall be carried out in the workshop.

The ends of compression members at splices, caps, or bases, which are dependent on contact for transmission of compressive stress, shall be machined so that the butting faces are in contact except for small areas. These shall not exceed 20% of the total area, where the clearances do not exceed 0.15mm. Bearing stiffeners shall be cut and ground to ensure a tight fit along edges in contact with flanges.

5.14 Welded Connections

Welding shall comply with EN 1011 and EN 2560. Unless specified on the contract drawings or agreed with the Engineer separately in writing all welded connections are to be formed by suitably qualified welders in approved workshops and not on site.

Where site welding is approved or specified it shall be carried out to conform with EN 1011 by suitably qualified welders using electric arc welding equipment. Gas welding will not be permitted. Full details of the Steelwork Contractor's proposals for site welding including equipment and electric plant shall be submitted to the Engineer in writing for his approval. Precautions shall be taken to guard against any adverse effects arising from weather conditions. Details of Welding for Approval The Engineer shall require complete details of joint preparation, size and sequence of individual runs of weld and of welding jigs, temporary erection cleats, erection holes etc., to be sent for his approval either with or on the Contractor's shop drawings, and he shall be given a minimum of ten working days' notice of when individual fabricated sections are available for inspection.

5.15 Tests for Welders

The Steelwork Contractor shall submit certificates to the Engineer to confirm that all welders engaged on this contract have qualified in tests in accordance with BS 4872 Part 1 within the six months prior to fabrication, as set out in EN 1993 Parts 1-6. The Engineer may require that such welders shall carry out satisfactorily the appropriate test procedure laid down in EN 287, BS 4871-3 and BS 4872 for the class of work involved in his presence or in the presence of his representative. The cost of such tests shall be borne by the Steelwork Contractor.

5.16 Distortion

The Steelwork Contractor shall take all reasonable steps to minimise distortion of steelwork during welding. Unless the Steelwork Contractor informs the Engineer prior to commencement of fabrication that distortion will occur, it will be deemed that no distortion will occur.

5.17 Grade S355 Material

Where Grade S355 material is prepared for welding by flame cutting, the cutting process shall be controlled to prevent increase of hardness, or the welding process shall be devised to allow welds to be made satisfactorily on the hardened material. Tack welds with Grade S355 steel shall be avoided if possible, but where they are required, pre-heat shall be applied, and the welds subsequently cut out and not welded over.

5.18 Welding Procedures and Materials

The Steelwork Contractor shall take precautions to ensure that the weld is maintained at full size throughout the length deposited.

The Steelwork Contractor shall so organise his fabrication that welding in other than the down hand position is kept to a minimum. Welding electrodes for manual metal arc welding shall comply with EN ISO 2560. Electrodes, wire and fluxes for the submerged arc welding of carbon steel and medium tensile steel shall comply with EN ISO 14171 and EN ISO 14174.

Filler rods and wires for gas shielded arc welding shall comply with EN 14341 and EN ISO 636. The forming, by flame cutting, of edges to be welded shall not be permitted.

5.19 Requirements of Completed Welds

Welds shall exhibit the following features during and on completion of the weld:-

Shape of Profile

Unless the weld is dressed flush, there shall be external weld overfill (reinforcement). The height of overfill shall be restricted to 10% of the thickness of the thinner part joined and this shall be subsequently symmetrical about the centre line of the joint.

Smoothness of Joint in the Weld

The joint in a weld run where welding has been recommenced or completed shall show no pronounced hump or crater in the weld surface.

Quality of Weld

The weld metal as deposited shall be free from weld defects such as cracks, slag inclusions, gross porosity, cavities etc. The weld metal shall be properly fused with the parent metal without serious undercutting or overlapping, but slight intermittent occurrences may be disregarded, provided that the undercut or overlap does not form a sharp notch. Any undercutting should be made good by the deposition of additional weld metal.

Removal of Weld Overfill (Reinforcement)

Where butt welds are to be ground flush with parent metal, it is essential that Clause (i) above is adhered to prior to grinding. On completion of grinding the parent member must not be reduced below the design thickness.

Visual Inspection

All welds and adjacent surfaces shall be examined visually to ensure the absence of the following defects:

1. Cracks in the weld or adjacent surfaces.
2. Slag inclusions.
3. Porosity.
4. Lack of fusion at the edge of weld.
5. Undercut.
6. Concave weld profile.
7. Excessive convex weld bead.
8. Poor transition between weld and members welded.
9. Lack of penetration at the root of the weld.
10. Lack of alignment between components of joint.
11. Excessive penetration bead.

5.20 Correction of Faulty Welds

Where welds do not comply with the requirements of this Specification the defective portion shall be removed. This shall then be re-welded and re-inspected in accordance with this Specification.

5.21 Bolted Connections

All bolt holes shall be punched and flame cutting shall be strictly prohibited. Drifting shall not be used in holes which are one-third diameter or more off-centre. Rectification may be made by reaming, provided the design of the connection will allow for larger diameter holes and bolts.

Unless otherwise specified all bolted connections are to be made using Grade 8.8 bolts or high strength friction grip bolts with load indicating washers. The bolts are to be tightened in accordance with the manufacturer's recommendations.

In no case shall shot firing equipment be used for the purpose of fixing claddings etc., to the steelwork without the Engineer's written approval. All bolts are to be fitted with a suitably shaped washer under the nut with a second washer under the head if faces are not parallel. On painted steelwork sherardised or cadmium plated bolts, washers and fittings shall be used. Wire brushing and painting on site is not acceptable.

All bolts, washers and fittings for galvanised steelwork shall be similarly galvanised or treated in some other manner which is compatible with the surface treatment of the members. The use of cold galvanising or painting is not acceptable.

Bolts in bolted connections to galvanised or metal-sprayed steelwork shall be washered under nuts and bolt heads. Bolted connections in hollow members will not be allowed unless "through sleeves" or "ferrules" sealed on both faces are used.

The lengths and degree of tightening of all holding down bolts shall be specified by the Steelwork Contractor on the drawings. All bolts, which are subject to vibration, direct tension, alternation of stresses or where used on lifting beams, are to have their nuts locked in an approved manner to the satisfaction of the Engineer. All bolted connections shall be designed in such a manner that none of the threaded portion comes within the bearing surfaces.

Unless fitted or close tolerance bolts are specified, site connections shall be made with bolts through holes 2mm larger than the bolt diameter, i.e. 18mm diameter hole for 16mm diameter bolt. Drifting with properly formed taper or barrel drifts will be permitted provided always that sufficient force is not used so as to cause elongation of the boltholes.

Where close tolerance bolts are specified, the holes are to be 1mm larger than the bolt size. Where turned and fitted bolts are specified the holes in the members are to be drilled undersize and, after assembly, reamed to a diameter not exceeding the diameter of the bolt specified plus 0.5mm. Where High Strength Friction Grip Bolts are used in lieu of fitted or close tolerance bolts, they shall be supplied EN 14399-1 and fixed as recommended in EN 1993 Parts 1-6.

At the time of assembly of connections incorporating high strength friction grip bolts, the surfaces in contact shall be free of paint or any other applied finish, oil, dirt, loose rust, loose scale, burrs or any other defects which would prevent the solid seating of the parts or would interfere with the friction between them.

High strength friction grip bolts are to be tightened systematically using the part - turn method where they occur in groups. The order of tightening is to be agreed with the Engineer.

5.22 Base Plates

Base plates shall have a minimum of 2 No. 25mm diameter holes to prevent the formation of air pockets during the placing of grout bedding.

Base plates exceeding 0.75 square metres, in area may require more or larger diameter air release holes and the Steelwork Contractor shall allow for the cost in his tender.

In base plates thicker than 20mm suitable oversize holes and thicker washers shall be used to allow for out of plumb of holding down bolts.

5.23 Erection Packings to Base Plates

Should the Steelwork Contractor wish to use erection packings below base plates, a minimum of 4 No. Sets equally distributed around the perimeter of the base plate must be provided. The sizes and positions of erection packings must be considered in the design of the base plate and be clearly shown on the Steelwork Contractor's Working Drawings.

Steel packs under base plates shall not be less than 50mm wide, and each pack shall comprise not more than four separate plates.

5.24 Bedding Space

All base plates up to and including 0.75 square metres in area shall have a minimum bedding space of 25mm. Base plates exceeding 0.75 square metres in area shall have a minimum bedding space of 50mm.

5.25 Grout Filling and Bedding

Unless otherwise specified by the Engineer or required by the design of the Steelwork Contractor, all holding down bolt sleeves and base plates will be completely filled and bedded on a non-shrinkable, non-expanding grout. The minimum 28-day strength of the grout is to be 35N/mm². No grouts containing calcium chloride will be permitted.

5.26 Preparation of Hollow Sections

Ends may be prepared for welding by sawing, machining, or by hand flame cutting using properly prepared templates or by automatic flame cutting or any other methods approved by the Engineer. The correct fusion bevel may be achieved by flame cutting and/or grinding or machining. A smooth contour, free from irregularities is essential. Surfaces should also be free of any deleterious matter likely to affect the ease of welding and the efficiency of the connection. Where hollow section bracings have ends flattened for bolted connections, ends must be effectively sealed by welding. Before sealing, the inside of hollow sections must be dry and free from loose material, and loose scale etc.

5.27 Assembly of Hollow Sections

End-to-end connections of hollow sections must be assembled using backing strips. On assembly the maximum permissible misalignment shall be not greater than 20% of the wall thickness, nor more than 1mm, whichever is the smaller. After tack welding the root gap shall not be less than the minimum shown for the applicable weld preparation.

End preparation for branch connections to be butt or fillet welded shall be in accordance with the recommendations of B.S.C. Tubes Divisions Model Specification for Structural Hollow Sections.

All ends of structural hollow sections should be sealed by welding to give a corrosion free interior, and in exposed structures the use of self-tapping screws or other devices will not be permitted. Where structural hollow sections are to be galvanised, they are to be provided with suitable vent holes, the location and size of which are to be to the requirements of the Galvaniser. All such holes are to be plugged after galvanising with a durable non-ferrous material.

5.28 Headed Stud Shear Connectors

Headed stud shear connectors shall comply with EN ISO 14555 and EN ISO 13918 and all studs shall be inspected to ensure full 360 degrees of satisfactory weld fillet.

The Steelwork Contractor shall allow within his rates for testing at least 1% of all stud connectors by bending through an angle of 15 degrees from their original axis, all studs tested to be left at 15 degrees and not re-bent. Any stud that exhibits signs of weld fracture shall be deemed to have failed this test and shall be replaced by the Steelwork Contractor at no cost to the Contract.

5.29 Stability During Erection

The responsibility for maintaining the stability of the works at all times shall be the Steelwork Contractor's sole responsibility and any costs arising from the provision and removal of bracing, propping, guy ropes etc., shall be at no additional cost to the Contract.

The Steelwork Contractor shall agree with the Engineer and Main Contractor his proposed method of erection. In addition, he shall agree with the Engineer and the Main Contractor his proposals for temporary bracing etc., to ensure that the stability concept is maintained.

5.30 Holding Down Bolts

The Steelwork Contractor shall supply and deliver to site holding down bolts and assemblies to suit the Main Contractor's programme. The Steelwork Contractor shall also supply to the Main Contractor suitable templates which correctly position the bolts and rigidly hold them to line, level and plumb during the casting operation. Unless otherwise noted, all holding down bolts to have a minimum projection of 150mm or to the agreement of the Engineer.

The Main Contractor will provide any necessary bolt boxes and cast the bolts into the concrete all in accordance with the Steelwork Contractor's details and the Contract Documents.

Horizontally fixed bolts and bolt groups shall be cast or drilled in accurately within the tolerances as follows:

Vertically +/- 2mm

Horizontally +/- 6mm

No tolerance is allowable on the relative positions of bolts within any one group.

The Steelwork Contractor is to ensure that all end connections have elongated horizontal holes, which allow for the specified tolerances.

5.31 Erection

Care shall be taken when transporting, storing, handling or erecting all material to ensure that no part is damaged. Any damaged material shall be rectified or replaced at no cost to the contract, and no damaged part shall be erected into the structure without the written approval of the Engineer.

The Steelwork Contractor shall ensure that materials delivered to site are stored safely with adequate timber bearers and not in areas of the site where the steelwork has a high risk of sustaining damage. The Steelwork Contractor shall ensure that all phased delivery dates of components and materials arrive on site without delay and be in accordance with previously agreed written programme deadlines.

Members and components shall not be altered on site without the approval of the Engineer. Should alterations be required the Steelwork Contractor shall make known to the Engineer his proposals in respect of the alteration, its effect, if any, on the design and his proposals for all remedial work in respect of protective coatings etc. The Steelwork Contractor shall keep on site during all working hours a competent foreman who shall be empowered to receive and act upon any Engineer's instructions, issued through the Main Contractor.

Before commencing erection, the Steelwork Contractor shall visit the site and check the holding down bolts for line, position and level. After these have been checked responsibility for all future setting out of the steelwork shall be the responsibility of the Steelwork Contractor. Should any discrepancies be found in the setting out of the holding down bolts these are to be reported immediately to the Engineer. The Steelwork Contractor shall be responsible for accurately positioning, levelling and plumbing of all steelwork, in accordance with the specified tolerances. Where applicable all bearings shall be securely supported on suitable steel packs prior to grouting by the Main Contractor.

Upon completion of erection the Steelwork Contractor shall remove all his equipment from the Site and make such areas in which he has completed his work progressively available to the Main Contractor. The framing must be levelled, plumbed, lined through, wedged and bolted up before grouting up and/or handing over to the Main Contractor. The Steelwork Contractor must obtain in writing from the Main Contractor an acceptance of his steelwork at the time of handing over.

5.32 Erection Scheme

The Steelwork Contractor shall submit to the Engineer for approval, details of the proposed scheme and erection programme together with all calculations for erection stresses, site splices etc., at least two weeks before erection commences.

The approval by the Engineer shall not absolve the Steelwork Contractor in any way from responsibility for safe and proper erection. Details of proposed crainage shall also be submitted. All steelwork shall be erected in accordance with EN 1090 and National Structural Steelwork Specification and the limiting stresses specified in that Code shall not be exceeded during erection.

5.33 Fabrication Tolerances

The Main Contractor and the Steelwork Contractor must agree the relative tolerances for the steelwork, and concrete or any other relevant components to ensure that the separate elements fit together.

None of the individual tolerances may be added together to obtain cumulative tolerances, and where more onerous tolerances are required to achieve the final requirements of the structure after completion of erection, lining and levelling these are to be adopted by the Steelwork Contractor at no additional cost. Steelwork shall be to the following tolerances:

Overall straightness: 1 in 500.

Overall member length up to 3.0m +0 - 1.0mm, over 3.0m +0 - 2.0mm.

Angular twist $1(3 + 0.5L)$ mm where L is the member length in metres.

Connecting flanges welded to hollow sections flatness measured at plate edges +/- 1mm

Angular twist shall be determined by placing the fabricated member against a flat surface(s) as appropriate to the member size and shape and measuring the differences between the two corners at the opposite end.

The tolerances for the setting out and positioning of bolt holes, cleats or brackets shall not be more than half the tolerances allowed above for the type of bolts used. The level of cleats and brackets shall be such that the variation between extreme points does not exceed 1/200 of the dimension between these points or 1mm, whichever is the least.

However, units fabricated wholly or largely from plate shall be to tolerances as specified on the Engineering drawings or as stated otherwise elsewhere. If no such tolerances are specified on the Engineering Drawings, they shall be as above. The Steelwork Contractor shall ensure that the completed parts and members are accurate both in section and elevation to ensure that erection to the specified tolerances takes place without any straining, distortion, or permanent stress in the structure.

5.34 Erection Tolerances

A temporary datum level (TDL) and temporary setting out datum lines (TSL) will be established and agreed on site between the Engineer and the Main Contractor. These datum's will be maintained throughout the contract by the Main Contractor and shall be considered as the site datum's and used for all setting out.

Permissible deviation in setting out measured from +/- 5mm up to 30m from the TDL in any direction and +/- 10mm max 60m and over.

All intermediate tolerances are to be interpolated.

Slope of horizontal members Shall not exceed 1 in 500 or +/- 10mm whichever is the smaller.

Plumb of vertical members Shall not exceed 1 in 500, or +/- 5mm whichever is the smaller.

Distance between adjacent main columns +/- 5mm.

The permissible deviation of any level from the TDL shall not exceed +/- 5mm.

Twist and straightness – as per Fabrication Tolerances.

Plumb shall be determined by the measurement at any point in the vertical members height, related to a point on the vertical member 300mm above the base plate.

5.35 Protective Treatment Galvanising

Galvanising shall be performed in accordance with EN ISO 1461 to a minimum thickness of 85 microns (610 g/m²). Small areas of damaged galvanised surfaces which are within 10mm of intact galvanised coating may be touched up in accordance with EN ISO 1461.

Preparation for touching up is to be as required by the manufacturer of the touch up product. Small areas are defined as an area not exceeding 2% and with no dimension exceeding 25mm.

5.36 Surface Preparation Prior to Painting

Degreasing and removal of dirt is to be carried out thoroughly as described by EN ISO 8501. Abrasive blasting will be carried out to the requirements of S.a. two and a half Swedish Standard.

Except where otherwise specified all surfaces are to be thoroughly cleaned of millscale, rust, dirt, grease, etc., S.a. two and a half Swedish Standard.

The depth of surface indentations due to abrasive blasting shall not be less than 0.05mm or more than 0.100mm. The surface is to be tested with a copper sulphate solution after blasting. A 4% solution of copper sulphate in 1% sulphuric acid is to be used for this purpose. The surface thus treated shall contain less than 10% residual mill scale.

After blast cleaning all surface defects including cracks, shelling, laminations shall be removed. All fins from saw cuts; burrs and sharp edges shall be similarly removed.

Where extensive grinding is necessary to remove defects, etc., the dressed areas shall be reblasted to provide a suitable painting surface. Dust off and within two hours of shot blasting apply by airless spray one coat of 2 Pack Epoxy Phosphate Blast Primer (Ref. A5214) to a dry film thickness of 35 microns. Allow to dry.

It is preferred that all fabrication is completed prior to surface blasting. Should fabrication take place after blasting then the standard of surface cleanliness at the time of painting must be equivalent to c.St.3 Swedish Standard.

After fabrication carefully remove all weld flux and spatter, rough edges etc., by scraping, chipping and grinding to a smooth surface. Remove any unsound 'scorched' primer around weld areas, all dirt, grease etc. Wash with white spirit where necessary. Spot-prime all bare metal with a Zinc Phosphate Blast Primer consisting of a base and an activator and allow to dry overnight.

Wire brushing is not permitted as a mill scale removal method. The only exception is that of steelwork already abrasive blasted and where nominal rusting is apparent. Priming of the clean blast steel should be carried out within 2 hours of shop-blast. The blast primer shall be a 2-pack epoxy zinc phosphate primer (grey) applied by airless spray to give a minimum dry film thickness of 20 microns.

The site holding primer shall be a 2-pack epoxy zinc phosphate primer (grey) applied by airless spray to give a dry film thickness of 60 microns. All primers shall be suitable for the later application of intumescent paint.

5.37 Patch Priming After Erection

After erecting, all site contaminants shall be removed and the steelwork shall be patch primed if required with the specified primer.

5.38 Intumescent Coating

Intumescent coatings shall consist of Steelmaster 70 WB (or similar approved) halogen-free water based intumescent coating (applied over a compatible primer) with a finish coat of Steelmaster Top Sealer (or similar approved).

The zinc phosphate primer shall be Painting System B as set out in this specification or equivalent approved, provided always that it is compatible with the Intumescent overcoat.

The Steelmaster 70WB shall be applied by airless spray to provide the DFT's set out in the quantity sheets.

DFT's up to 900 microns can normally be achieved with one coat by Airless Spray application.

DFT's up to 1500 microns can normally be achieved with two coats by Airless Spray application.

DFT's over 1500 microns will require three coats by Airless Spray application.

Steelmaster Top Sealer will be applied by airless spray in two coats to provide a DFT of 100 microns to a selected colour.

Intumescent coatings shall be applied strictly in accordance with the manufacturer's instructions. Generally the steelwork will be pre-coated in the works. However all necessary touching up of damaged areas will be done on site.

All sherardized connecting bolts, heads and washers at the ends of coated members shall be site coated as follows:

- (i) (Apply a 'Jotun Penguard Special' epoxy primer at the rate of 0.5 litres/sq. metre.
- (ii) Brush apply two coats of Steelmaster 70 WB to provide a DFT of 800 microns. B
- (iii) rush apply Steelmaster Top Sealer in two coats to provide a DFT of 100 microns.

5.39 Weld Testing

The Engineer may require certain welds to be subjected to inspection by gamma-radiography, ultrasonic or other non-destructive methods. Where inspection is by gamma-radiography the Steelwork Contractor shall make available sufficient space around the part being radio-graphed for proper observance of the safety precautions against radiation and shall include in his price and programme for so doing.

The testing and acceptance of welds shall be carried out in accordance with all relevant British Standards. The acceptance level of weld to be in accordance with EN 287. In addition to such testing work which he would normally carry out as part of his quality control procedures, the Steelwork Contractor shall include for the cost of testing of welds by an independent testing Authority.

The amount of such testing shall be as follows:

- Approximately 10% of the total length of all welds.
- All welds carrying loads in excess of 20 tonnes.
- All welds with materials exceeding 25mm thickness.
- All special or unusual welds which will be generally indicated on the contract drawings.

The Steelwork Contractor is to submit to the Engineer at weekly intervals the testing reports.

Should it be shown that 5% or more of the welds tested are unsatisfactory then the Steelwork Contractor shall test all welds at no cost to the contract.

All welds failing to comply will be re-done in an approved manner and to the satisfaction of the Engineer and all associated costs will be borne by the Steelwork Contractor.

6. BLOCKWORK

6.1 Materials

All concrete blocks currently manufactured in Ireland are required to meet the requirements of I.S. EN 771-3, and the relevant guidance included in S.R. 325. The aggregate used in the manufacture of these concrete blocks are required to comply with I.S. EN 12620 (3), and the guidance for use in Ireland is in S.R. 16. These standards contain limits which control properties affecting end use performance, along with a requirement for geological and petrographic assessment of the aggregates (i.e. to determine the presence of potentially deleterious materials).

Materials shall comply with the following specifications:

All masonry shall be produced in accordance with I.S. EN 771-3:2011 Aggregate Concrete Masonry Units (Dense and Lightweight), conforming to CE Level 2+ Externally Certified by a notified body (i.e., NSAI).

Solid Concrete Blocks

Group 1 Masonry Units Conforming to I.S. EN 771-3.

The declared mean compressive strength for Group 1 masonry units shall be 7.5 N/mm² (dry strength to I.S. EN 772-1)

Hollow Concrete Blocks

Group 2 Masonry Units conforming to I.S. EN 771-3.

The declared mean compressive strength for Group 2 masonry units shall be 4.5 N/mm² (dry strength to I.S. EN 772-1)

Lightweight Solid Concrete Blocks

Group 1 Masonry Units Conforming to I.S. EN 771-3.

The declared mean compressive strength for Group 1 masonry units shall be 7.5 N/mm² (dry strength to I.S. EN 772-1)

Clay Bricks

Group 1 or Group 2 Masonry Units conforming to I.S. EN 771-3.

The declared mean compressive strength for Group 1 masonry units shall be 9 N/mm² and 13 N/mm² for Group 2 masonry units.

Mortar

Mortar Designation (iii) according to I.S. EN 1996-1-1. Strength class M4 according to I.S. EN 998-2 (nominally a 1:1:5 mixture of CEM I, lime and fine aggregate measured by volume of dry materials).

Cement for Blockwork

I.S. EN 197-1: 2011

Aggregates for Blockwork

I.S. EN 12620 & S.R. 16 Guidance on the use of I.S. EN 12620 Aggregates for Concrete.

Sands

I.S. EN 13139 & S.R. 18 Guidance on the use of I.S. EN 13139 Aggregates for Mortar.

Water

I.S. EN 1008 Mixing water for concrete.

Wall Ties

I.S. EN 845-1 Specification for ancillary components for masonry – Part 1: Ties, tension straps, hangers and brackets.

6.2 Concrete Blocks

Concrete blocks shall be steam cured factory-made blocks of uniform texture and shall be obtained from an approved manufacturer.

Solid Concrete Blocks are generally available in the following strengths: 7.5N, 13N, 18N, 24N and 36N. Refer to Engineering Drawings for required strength of blockwork.

6.3 Mortars

The mortar mix shall be composed by volume of 1 part cement, 1 part lime and 5 parts sand.

A 1:1:5: cement : lime : sand mix shall have a minimum strength class M4 (i.e. 4 N/mm² compressive strength at 28 days), unless noted otherwise on the Engineering Drawings.

The work strengths shall be not less than two thirds of the preliminary strengths.

Coloured mortar shall be obtained by the addition of an approved waterproofing agent used in strict accordance with the manufacturer's instructions.

Ready mixed mortars shall not be used without the Engineer's approval.

All mortar shall be well mixed and tempered on a clean floor or boarded platform and where cement is used as a matrix in whole or in part, mixed only in quantities sufficient for immediate use. Any mortar, which has, partly set is not to be re-used and shall be discarded.

6.4 Mortar Tests

The 1:1:5: cement : lime : sand mortar shall be tested as follows:-

- Preliminary tests shall be made of six 100mm mortar cubes, made, cured and tested and the results recorded in accordance with the recommendations of BS 1881.
- The cubes shall be made in steel moulds of approved design. Three cubes shall be tested at seven days and the remaining three at twenty-eight days. The cubes shall comply with the strengths previously specified.
- The Engineer may, at any time, direct the 100mm test cubes be taken in his presence from typical batches of mortar.

6.5 Workmanship

Workmanship shall be in accordance with BS 5628-3 and IS 325-1 and 2.

6.6 Walling

Walling shall be carried out in a uniform manner, no one portion being raised more than 900mm above another, with bed and vertical joints average 10mm thick. Vertical joints shall be fully flushed up as the work proceeds and all walling shall be carried up in a uniform manner with true and vertical quoins and shall be properly bonded.

215mm thick solid blockwork walls shall be constructed with a single interlocking course (not the traditional double course).

6.7 Cavity Wall Ties

The leaves of a cavity wall should be tied together by vertical twist stainless steel or equal approved wall ties embedded in the horizontal mortar joints at the time the course is laid, to a minimum depth of 50mm. The length of the wall tie should be chosen to suit the width between the two leaves. For a 100mm wide cavity, the ties should be placed at a frequency of 750mm horizontally and 450mm vertically and they should be provided within 225mm of all openings and control joints so that there is one for each 225mm of height of the opening.

Ties shall be placed at a greater frequency for wider cavities. Refer to Engineering Drawings for specific requirements.

6.8 Collar Tied Walls

Collar tied walls shall be formed from two number 100mm walls with a 15mm space between, filled solidly with mortar. The two walls shall be tied with flat stainless steel wall ties ragged ended with a cross-sectional area 20mm x 3mm placed at 450mm centres vertically and horizontally with a minimum embedment of 60mm in each wall.

6.9 Damp Proof Course

Damp proof course shall be an approved Low Density Polyethylene damp proof course complying with the requirements of BS 743. Damp proof courses shall be laid in accordance with the requirements of CP 102:1973, BS 8102:1990 and BS 8215:1991 as appropriate.

6.10 Testing of Blocks

For the purpose of testing conformity of the block with this specification, ten blocks shall be selected at random from every batch of 1000 blocks and tested at the Institute for Industrial Research and Standards in accordance with I.S. EN 772-1.

6.11 Tolerances

The permissible deviation for blockwork shall be as follows:

Level: For any nominally horizontal surface when measured from the nearest reference level : +/- 10mm.

Position on Plan: For the position of any nominally vertical surface at the lower edge when measured horizontally from the nearest reference line : +/-10mm.

Plumbness: The permissible deviation from plumb of the upper and lower edges of any nominally vertical surface shall be 3mm in any 1m but not more than 10mm.

The permissible deviation from straightness, measured horizontally shall be +/-10mm.

The permissible deviation for abrupt change in a nominally continuous surface shall be +/-3mm.

The permissible deviation from the specified relationship of any two surfaces at a junction shall be +/-3mm.

The permissible deviation in joint thickness shall be as follows: -

Horizontal joints : joint thickness +/-3mm combined thickness in any 1m height +/-10mm.

Vertical joints : joint thickness +/-3mm combined thickness in any 3m length +/-10mm.

The permissible deviation for bed joints from the nearest horizontal reference shall be +/-10mm.

7. STRUCTURAL TIMBER

7.1 General

Structural timber shall comply with I.S. EN 1995-1-1:2004 (Eurocode 5: Design of Timber Structures – General Common Rules and Rules for Buildings) + AC:2006 + A1:2008 + A2:2014, including Irish National Annex – NA:2010; and B.S. 5268.

Timber Trusses for Roofs shall comply with I.S. EN 1995-1-1:2004 and S.R. 70:2015.

7.2 Specialist Suppliers

The Contractor shall nominate specialist suppliers for laminated timbers or trussed rafters as applicable. The appointment of these suppliers shall be subject to the Engineer's approval.

7.3 Type and Grade of Timber to be Used

Trussed rafters and general structural timber shall fall within group species Service Class 3 (BS 5268) in accordance with "Timber Grades for Structural Use" irrespective of any other grading carried out at source.

All structural timber shall be Grade C16 to I.S. EN 338:2016 (Structural Timber – Strength Classes) (formerly C16 to IS 444:1998, now withdrawn), unless noted otherwise on the Engineering Drawings.

Any laminated beams shall be formed with laminations graded LB in accordance with B.S. 5268, Part 2 and each member shall be manufactured from single grade lamina on.

7.4 Marking of Timber & CE Marking

The species group and stress grade shall be marked on all timber. All timber re-sawn from stress graded stock shall be regraded before use. In order to comply with the Construction Products Regulations, all 'Structural Timber Products/Elements and Ancillaries' and 'Wood Based Panels and Elements' must also incorporate the letters CE.

7.5 Declaration of Performance

Manufacturers are required to provide a Declaration of Performance (DoP) for all Structural Timber used on the project, which contains technical information to demonstrate the product's fitness for purpose.

7.6 Dimensions

Timber dimensions in general, which are shown on the drawings or referred to elsewhere, shall be basic sawn sizes unless otherwise indicated or where the details dictate otherwise. In particular member sizes shown for all laminated beams are finished sizes.

7.7 Tolerance

The permissible dimensional deviations for timber work generally shall be as specified in B.S. 5268, Part 2. In the case of trussed rafters the maximum difference in thickness of abutting pieces shall be not greater than 1mm.

7.8 Finish to Timber

All timber exposed to view shall be planed and sanded on four sides prior to fabrication. In the case of laminated beams all machining is to be done after gluing. No checker or sanding marks are permissible. On exposed surfaces voids shall be filled, glued inserts shall be selected with care to match grain and colour.

Outside laminations shall be free from loose knots and open knot holes. The timber for outside laminations shall be selected with reasonable care to match colour and grain at edge points.

7.9 Loading

The roof loading to be assumed shall be as follows:

<u>GENERAL ROOF AREAS</u>	<u>kN/m²</u>
Trussed Rafters, Battens and Tiles	0.75 (on slope)
Metal Deck, Insulation and PVC Roof	0.25 (on plan)
Ceiling and Fittings	0.25 (on plan)
Imposed – Roof Level	0.60 (on plan)
Imposed – Ceiling Level	0.25 (on plan)

WIND

Wind loads described in Eurocode I.S. EN 1991-1-4:2005:

$$V = 47 \text{ m/s}$$

$$S1 = 1.0$$

$$S2 = 1.0$$

$$S3 = 1.0$$

7.10 Limits to Defects for Constructional Purposes

In the process of assembly and construction, the appropriate stress graded softwood shall be selected so that no defect permitted by such grading prejudices the strength of the completed structure at bearing joints and other assemblies.

7.11 Limits to Distortion

Any piece which is bowed, sprung, twisted or cupped in excess of the limits set out in EN 14250, shall be rejected.

7.12 Preservative Treatment

Timber members shall be double vacuum pressure treated with an approved preservative applied in accordance with the recommendations of BS 8417:2011 + A1:2014 Preservation of Wood – Code of Practice.

In the case of laminated beams and other exposed timbers the Engineer's approval shall be obtained before the application of the preservatives for inspection by the Engineer.

7.13 Fire-Retardant Coating

A fire-retardant coating shall be applied to all exposed timber surfaces to give the fire rating as specified by the Engineer.

7.14 Compatibility of Preservative Glue and Fire-Retardant Coating

The Contractor shall ensure the compatibility of the preservative glue and the fire-retardant coating, and he shall also ensure that no corrosive effects to metal plates, connectors, or bolts shall result from their use.

7.15 Moisture Content

The moisture content at the time of fabrication of both the trussed rafter and laminated beams shall not exceed 18% and shall comply with the glue manufacturer's recommendations. Adequate measures shall be taken to ensure that the moisture content does not rise above 20% during transportation, storage or erection.

7.16 Fabrication of Special Timber Trusses

Member lengths shall be selected to minimise the number of timber joints. Where they are necessary in the bottom chord of trussed rafters, metal plate connectors may be used provided they are positioned within the range 0.1 to 0.25 times the distance between the two nodes, measured from the nearest internal node.

End joining of individual laminations shall be carried out using finger-joints or scarf-joints. No butt jointing shall be staggered so that coinciding joints shall be separated by two full laminations.

The efficiency rating of the joint should be at least 0.75.

7.17 Glue

The glue to be used shall be of Type WBP. Care shall be taken to ensure that the glue is stored, mixed and spread strictly in accordance with the glue manufacturer's instructions.

7.18 Surfaces to be Glued

All surfaces to be glued shall be clean and free from dirt, dust, sawdust, oil and any other contaminating substances. Surfaces should be glued as soon as possible after they have been prepared. The surface to be jointed shall be flat and any unevenness on them should not exceed 0.4mm in depth or height.

7.19 Curing Period

All laminated members shall be stored at a suitable temperature for the curing period in accordance with the glue manufacturer's instruction.

7.20 Protection and Storage of Timber

Timber members shall, at all times, be protected from damage, staining, decay, insect attack and avoidable exposure to the weather. The Contractor shall prepare a level clean site for the storage of the timber members. The members shall be stacked on timber shims such that no bowing or damage takes place and they shall be protected against exposure to rain and extremes of temperature.

7.21 Toothed Plate

If toothed plate connectors are to be used, they shall comply with the recommendations of EN 912:2011 Timber Fasteners – Specifications for Connectors for Timbers.

7.22 Preparation of Plates and Bolts

All steel plates required in the roof construction shall be hot dip galvanised to EN 1461:2009 Hot Dip Galvanised Coatings in Fabricated Iron and Steel Articles – Specifications and Test Methods.

All steel bolts shall be zinc plated to BS 7371-12:2008 unless specified otherwise.

7.23 Inspection of Timber Members

The Contractor shall afford the Engineer or his representative every assistance in the inspection of timber members during all stages of fabrication and erection.

Any member found to be, or suspected of being, defective shall be replaced or test loaded to the Engineer's satisfaction at the Contractor's own expense.

The Contractor shall keep an approved type of moisture meter in his works for the control of the moisture content and for the use of the Engineer at the time of inspection.

7.24 Testing of Sample Members

The Engineer may require sample members to be test loaded to confirm the adequacy and compliance with specification. Such testing where required shall be carried out by the Contractor, or approved testing authority, in accordance with the relevant code of practice and to the Engineer's satisfaction.

7.25 Handline of Members

Care shall be taken at all times to ensure that the members suffer no damage or overstressing while they are being loaded, unloaded or lifted into position. Special care shall be taken to avoid damage to the sides and arises of members by lifting slings.

In all cases the supplier's recommendations shall be sought and complied with as a minimum precaution.

7.26 Erection of Members

The Contractor shall at all times have a competent foreman in charge of the erection of the timber members who shall ensure that the work is carried out in accordance with the drawings, the aforementioned specifications and the suppliers' recommendations. Any irregularities or inconsistencies shall be brought to the Engineer's attention.

7.27 Temporary Bracing

The Contractor shall be responsible for the stability of the partially completed structure. He shall provide and fix, in addition to the permanent bracing, any temporary bracing necessary for the stability of the partially completed structure. He shall arrange his programme of erection so that no part of the structure is unduly exposed to possible loading in an unpropped or partially propped state.

7.28 Permanent Bracing (Trusses)

Permanent bracing shall be fixed to ceiling joists and rafters to allow for wind and other horizontal loadings, as indicated on the drawings.

7.29 Deflection (Trusses)

Differential deflection between adjacent trussed rafters shall not exceed 3mm.

7.30 Inspection of Work in Fabricator's Factory

The fabricator shall permit and provide all assistance for the inspection of the work during fabrication, and for the testing of the timber and the metal plate connectors. No trusses shall be delivered to the

site un l inspected by the Engineer. Any trusses, which are rejected, shall be replaced at the fabricators own expense.

7.31 Protection of Trusses on Site

The general Contractor shall allocate an area for the storage of the trusses. He shall level and hardcore this area and shall provide adequate raised bearers to prevent distortion in the plane of the truss.

Protection against exposure to rain shall be provided in such a way as to allow the free circulation of air, and protection against exposure to ground or surface water shall be provided at all times.

8. WOODWORK

8.1 MATERIALS

Materials shall comply with the following specification:

Hardwood	-	BS 881
Softwood	-	BS 589
Woodscrews	-	BS 1210
Nails,	-	BS 1202
Ragbolts, coach, screws, fixing accessories	-	BS 1494
Timber connectors	-	BS 1579
Plywood, Chipboard	-	BS 5669
Fibre boards	-	BS 1142
Blockboard	-	BS 3444
Decorative laminated plastic sheet	-	BS 3794
Joinery workmanship	-	BS 1186
Glues	-	BS 1203, 1204, 1444, 745, 407
Softwood dimensions	-	BS 4471
Hardwood dimensions	-	BS 5450
Timber moisture content	-	IS 96

8.2 TIMBER FOR CARPENTRY

Timber shall be sound, well-conditioned, properly seasoned to suit the particular use and free from defects or combination of defects rendering it unsuitable for its intended use. It shall be free from loose and unsound knots, clusters of knots, wane, pitch pockets, woodworm and decay.

Timber to receive a clear finish, whether used in the solid or as a veneer, shall be of class IS. Samples of the timber proposed for use shall be submitted to the Employer Representative for approval and all timber used shall be equivalent in quality, colour and grain pattern. The joinery shall be constructed exactly as shown on the Drawings. Only correct methods of jointing shall be used, such as housing, tanning etc. being carried out where appropriate. All joints shall comply with B.S. 1186 Part 2. Take all reasonable measures to check or prevent capillary penetration of water in the joints and open connections of external joinery works and in all other positions where joinery works may be exposed to water.

The arrangement, jointing and fixing of all joinery shall be such that shrinkage in any part in any direction shall not impair the strength and appearance of the finished work and shall not cause damage to contiguous materials or structures. Reasonable tolerances shall be provided at all connections between joinery works and building proper, so that any irregularities, settlements or other movements shall be adequately compensated. Ensure that all weathering surfaces, throating's, grooves, joints etc. and all open connections shall be properly executed and shall obtain a reasonable degree of weather resistance.

Should any of the joinery work shrink, warp, wind or fly more than 3mm before termination of the Defects Liability Period, the same shall be removed and new re-fixed in its place at the Contractor's expense together with any other work which may be thereby affected.

All joinery shall be in strict accordance with the detailed drawing. No stock mouldings etc. will be allowed in any position of the Works. Hardwoods shall be protected with polythene sheeting or other approved method against all forms of staining, discoloration or any other damage during the course of the building operations. All hardwoods so affected shall be replaced at the Contractor's expense.

All timber used in unexposed carpentry, except where otherwise specified, shall be best quality white deal, thoroughly seasoned, free from large loose dead knots, shakes, sap or waned edges. It shall be given two coats of Protim or equivalent wood preservative.

All timber used in joinery is to be best quality, preserved by pressure vacuum treated by Messrs. Protim or equivalent, except where otherwise stated, and obtained from an approved merchant. Manufacturer of all joinery shall be put in hand, framed up and left for seasoning immediately after award of the contract, but shall not be stopped or primed until inspected by the Employer's Representative. Joinery shall be in strict accordance with the detailed drawings, and stock mouldings will not be allowed in any portion of the works. Any work which warps, splits, shrinks or opens during a period of 12 months after completion of the building shall be removed and replaced at the Contractor's expense.

The strength grade shall be stamped on the timber.

The term 'home-grown' shall mean grown in Ireland or Britain and shall be equivalent to the term 'British Grown' where used in BS 5268, Part 2. The moisture content of all timbers shall conform to the limits set out in I.S. 96. The Contractor shall be responsible for ensuring that the moisture content of timber for joinery work is appropriate to the conditions in which the materials are to be employed.

8.3 SOFTWOOD FOR CARCASSING FIRST FIXINGS

Timber for structural use shall be strength C16 and to be stamped on the timber.

8.4 TIMBER BOARDING

Timber boarding shall be free from the following:-

1. Cupping in excess of 1mm for each 50mm of width.
2. Unsound knots exceeding 25mm in diameter or loose knots or knot holes exceeding 10mm diameter.
3. Wear on faces.
4. Fixtures on faces in excess of 1mm width or 300mm in length or greater in depth than half the thickness of the board.

8.5 PLYWOOD

Plywood shall comply with EN 13986 and IS EN 636.

Use as follows:-

Grade 1 veneer	where clear finish required.
Grade 2 veneer	where oil painting required.
Grade 3 veneer	for concealed surfaces

Bonding type

MR.	for interior use WBP.
for exterior use INT.	not to be used.

Marine plywood shall comply with B.S. 1088.

Fibre Building Boards

Hardboard and soft board shall comply with B.S. 1142, Part 2 and 3.

8.6 NAILS

Nails shall comply with B.S. 1202. Nails for fixing joinery having one external exposed face shall be non-ferrous or sherardised steel nails. Hardened high tensile steel masonry nails shall be cadmium plated, gunfired grade.

8.7 WOODSCREWS

Screws shall comply with B.S. 1210. Screws for fixing joinery having an external exposed face shall be solid brass.

8.8 BOLTS

Bolts, expanding bolts, rag bolts, coach screws and other fixing accessories shall comply with B.S. 1494.

8.9 CONNECTORS

Shear plate connectors, toothed connectors shall comply with B.S. 1579. Framing anchors, joist hangers etc. shall be hot dip galvanised of a type to be approved by the Employers Representative.

8.10 ADHESIVES

Adhesives for:-

- a. Exterior use shall be synthetic resin type complying with B.S. 1204 Part 1 - type WBP
- b. Interior use shall be synthetic resin type complying with B.S. 1204 Part 1 - type MR.

8.11 SEALANTS

Mastic shall be non-setting butyl mastic to the approval of the ER.

Two part polysulphide sealing compound shall comply with B.S. 4254 and be grey in colour.

8.12 PRESERVATIVE

All timber described as treated with preservative shall be treated by one of the following methods:

Pressure impregnation -not permitted for external joinery softwood. Double vacuum impregnation - not permitted for fillets in concrete or ground cills in contact with brickwork, blockwork, mortar etc. at or below

DPC

level.

Pressure impregnation treatment and the preservative used shall comply with BS 4072 and shall be to the appropriate average dry salt retention specified in BS 5268: part 5 table 3. After pressure impregnation timber shall be dried back to moisture content of 15-20% in accordance with BS 4072 (para 13).

Double vacuum treatment and the preservative used shall comply with the British Wood Preserving Associations (BWPA) specifications 112 to 116 appropriate for the company treating the timber. Timber shall be allowed to dry in open storage for 48 hours following treatment. Prices for timber described as treated with preservative shall include for applying two brush coats of a preservative recommended by the timber treating company to all notches, holes, cut ends or surfaces machined after treatment.

8.13 TOLERANCES FOR FIXING COMPONENTS

The permissible dimensional reductions from the basic sawn size to the finished size of timber used in second fixings, components shall be 3mm for each wrought face.

8.14 STORAGE of MATERIALS

All materials shall be stored under cover in dry well-ventilated storage and stacked to allow free circulation of air around each item. Joinery shall not be fixed before the building has dried out to a suitable level which can be maintained.

8.15 WORKMANSHIP

Workmanship shall comply with the following Standards and Codes of Practice Joinery - BS 1186. All carpentry shall be executed in a workmanlike manner with all joints, fixings and methods of working chosen being the most appropriate for the work. All framed joints in joinery shall be mortice and tenon type as defined in BS 1186. Other joints shall be as shown on the drawings or as appropriate for their location and function. Any timber showing damage or signs of distress after fixing or jointing shall be removed and replaced.

Where screwed connections or joints are to be made the price shall include for pre-drilling a hole in the timber appropriate to the size of the screw being used. Arises in joinery work should be rounded to a 1.5mm radius. Where pelleting of fixings is required the pellets shall be of the same material as the joinery being fixed, shall match the colour and grain and be finished flush

8.16 FIXING OF IRONMONGERY

The tender sum shall be deemed to include for the fixing of all ironmongery in accordance with drawings and Ironmongery schedules. All locks, hinges and fastenings shall be fixed with screws, with proper counter-sinking for same. Matching screws shall be used for all hinges, fastenings and fittings.

All ironmongery is to be carefully wrapped and protected until completion of the works. Any ironmongery defaced or damaged prior to handover, will have to be replaced at the Contractor's expense as directed by the Employers Representative. All locks etc. are to be properly labelled and delivered up in accordance with the Employers Representative's instructions.

8.17 STORING MANUFACTURED COMPONENTS

Do not deliver to site any components which cannot be immediately unloaded into suitable conditions of storage. Unload, handle and store components in accordance with manufacturer's recommendations.

Store components in conditions suitable for specified moisture content, avoid prolonged exposure to direct sunlight and ensure good ventilation. Stack components on bearers on level dry floors under cover. When stacking stagger components or separate with spacers to prevent damage by and to projecting ironmongery, beads, etc.

Stack doors horizontally on not less than three level bearers at not more than 1m centres. Protection; avoid distortion of components during transit handling and storage. Retain protective coverings in position for as long as practicable, but remove on completion. Prevent damage to arises and glazing beads.

8.18 PRESERVATIVE TREATMENTS

Preservative treatment of timber shall comply with B.S. 5268 : Part 5 for the proposed use and durability of the timber. Treatment type: copper chrome arsenic vacuum pressure treatment or alternative solvent double vacuum treatment. Timbers treated with a water borne solution shall be dried down again to required moisture content before installation.

The moisture content of timber at time of fabrication and installation shall comply with I.S. 96. Before fabrication or installation, re-dry to the specified moisture content, timber which has been impregnated with copper/chrome/arsenic, by vacuum pressure treatment.

Provide a certificate from the processor with each consignment of the timber stating:

1. The preservation treatment carried out.
2. The moisture content of the timber prior to treatment.

Before treatment, carry out all sawing and planning to give the finished cross sections and, unless otherwise approved, all cross cutting, drilling or other machining.

Where manual treatment is to be carried out, brush preservative onto clean dry timber in flood coats with a soft bristle brush. Apply second and any subsequent coats after previous coat has soaked in, but before it has dried. Treatment shall extend a minimum of 300mm from ends in contact with concrete or masonry, unless otherwise indicated.

Liberally brush pre-treated timber with two coats of a compatible preservative supplied by the manufacturer or processor on any fresh surfaces exposed by drilling or cross cutting after treatment. Treated timber subsequently rip-saw and timber for use in ground contact which has been drilled or

cut, shall be retreated by the specified process. Do not apply any metal fittings to timber treated with copper/chrome/arsenic within seven days of treatment.

8.19 BOARDING

Where boarding is specified to be fixed or replaced ensure a close and tight fit along full length of boards and adjoining ends. Stagger end joints so they are not less than two board widths apart in all directions. Locate joints over centre of supports, unless boards are end matched. Fix boards at right angles, to supports, unless otherwise indicated. Remove any lipping at edges and provide a smooth surface.

For exterior cladding, lay and fix boards together under pressure, or otherwise, as directed. The length of nails for boarding shall be not less than 2.5 times the board thickness, but not longer than the combined thickness of the sections being jointed, less 3mm. The length of screws for boarding shall be not less than twice the board thickness, but not longer than the combined thickness of the sections being jointed, less 3mm.

Nail or screw boards of each support as follows, with nails punched below the face of screws countersunk flush with the face of boards. Where floor boards are to be replaced ensure that the following details apply:-

T and G boards: Up to 100mm wide - 1 nail or
 screw over 100 wide - 2 nails or
 screws

Plain edged boards: Up to 175mm wide - 2 nails or
 screws over 175mm wide - 3 nails
 or screws.

Secret nail boards at each support with one nail angle driven from above tongue.

8.20 SECOND FIXING AND TRIMS

Install trims where possible in unjointed lengths between angles or in straight runs. Mitre exposed angle joints unless otherwise indicated. Scribe timber sections to adjoining uneven surfaces unless other treatment is approved. Punch nail heads below surfaces of timber sections to be pointed or requiring a smooth surface. Countersink screw heads not less than 2 mm below surfaces of timber sections in trim work to allow for stopping. Countersink screw heads or bolts not less than 5mm below timber surfaces which are to be clear finished. Cut pellets from similar grained matching timber and glue in place with grain aligned. Finish flush with surfaces. Hardwood glazing beads shall be held with brass screws located not more than 50mm from each corner and spaced not more than 225mm apart intermediately. Screw fixing points shall be fitted with caps.

8.21 ASSEMBLING SECOND FIXINGS AND COMPONENTS

The quality of workmanship in joinery shall comply with B.S. 1186, Part 2 for requirements as to fit, precision of joints and the use of adhesives, unless otherwise indicated. Construct joinery as shown on the drawings unless otherwise approved. Where details of joints are not shown, obtain approval of proposed construction details before starting fabrication.

Slightly round sharp arises on exposed and semi-concealed surfaces. Sand and produce a smooth surface of joinery requiring a clear finish. Use approved filler to overcome the coarse grain or uneven suction conditions where growth rings are coarse and where there is uneven suction. Coat all knots and stop nail and other holes to match adjacent wood. Joinery detailed to be oil painted is to have a surface such that if it is properly painted in gloss paint no imperfections will be apparent.

Apply adhesive in accordance with the manufacturer's written instructions, and within any stated shelf life. Maintain mating surfaces in intimate contact to ensure adhesion within the setting time. Where

work is not to be painted, prevent discolouration of exposed surface due to staining by adhesives. Use dowels of hardwood other than beech, grooved for adhesive and sized for a driving fit.

8.22 CLEARANCE IN SECOND FIXINGS AND COMPONENTS

Where hinged joinery items, other than full size doors, are fitted flush between straight or rebated frames, leave a gap at all points of not less than 1.5mm and not more than 2.5mm for work intended to be painted or to receive a thick coated finish and not more than 1mm for work to be finished otherwise.

Where the edges of hinged joinery items, other than full size doors, are rebated to overlap the frame, leave a gap between the lip and frame of not less than 1.5mm and not more than 2.5mm for work intended to be painted or to receive a thick coated finish and not more than 1mm for work to be finished otherwise.

Fit drawers in openings so as to slide freely without undue play vertically or horizontally. Where drawer front is rebated over edges of opening ensure that face of rebate is not more than 1mm from face of framing at any point. Where drawer front is fitted into an opening the drawer front size shall be less than the opening size by not more than 1.5mm in width or height. Fit such drawers with accurately secured stops.

8.23 FIXING

Units shall be fixed into the ope reveals with a minimum of 15mm overlap to external reveals and shall be pointed around their perimeter, internally and externally, with a gun applied elastomeric silicon based sealant of selected colour. Fixings shall be at centres not greater than 400mm and shall not be closer than 200mm to the corners of units. Fixings shall be of corrosion resistant material and shall comply with BS 4873. Upstands to existing cills where necessary shall consist of sand/cement mortar (1:1:5) to provide seating for new windows. All surfaces shall be cleaned before the application of sealant in accordance with the sealant manufacturer's instructions.

8.24 PRESERVATIVE AND WOODWORM TREATMENT

All softwood timber shall be vacuum pressure treated with preservative to comply with I.S. 131. Any fresh surface exposed by drilling or crosscutting after treatment shall be treated with an approved preservative in an approved manner.

Vacuum treatment and the preservative used shall comply with the British Wood Preserving Associations (BWPA) specifications 112 to 116 appropriate for the company treating the timber. Timber shall be allowed to dry in open storage for 48 hours following treatment. Prices for timber described as treated with preservative shall include for applying two brush coats of a preservative recommended by the timber treating company to all notches, holes, cut ends or surfaces machined after treatment.

8.25 MASTICS

The mastics used shall be a polysulphide mastic complying with B.S. 5215. A sample of the proposed mastic shall be submitted to the Employers Representative for his approval. Adhesives used in the joinery works are to comply with B.S. 1204. All glues to comply with BS EN ISO 9665M.

8.26 MEASUREMENT AND INSPECTION OF WORK

Measure each ope prior to the manufacture of the joinery and shall be responsible for ensuring that the joinery work is the correct size. All joinery work will be inspected by the Employers Representative and approved prior to being wedged up.

8.27 MOISTURE CONTENT

The moisture content of the timber when the joinery is manufactured and delivered on site shall come within the limits given in I.S. 96.

9. CLADDING

9.1 General

The Contractor shall supply and install all roof and wall cladding as shown on drawings, including all accessories such as flashings, upstands, fillers, gutters, fixings, etc.

9.2 Roof Cladding

The roof cladding shall be Kingspan Quadcore KS1000 RW composite panel or equal approved with a 100mm insulation core to achieve a **U value of 0.19 W/m²K**.

The roof panels shall be guaranteed for up to 25 years.

9.3 Wall Cladding

The wall cladding shall be Kingspan Quadcore KS1000 MR (Micro Rib) composite panel (or equal approved), with an 80mm insulation core to achieve a **U-value of 0.24 W/m²K**.

9.4 Fire Certification

Roof and wall cladding shall be classified B-s1,d0 according to the European Reaction to Fire classification system (Euro classes) BS EN 13501-1:2007+A1:2009.

9.5 Metal Substrates

Substrate shall consist of a 0.5mm thick 275g/m² approved metallic protected steel to BS EN 10346:2015.

9.6 External Weather Sheet

The External Weather Sheet coating shall consist of Kingspan XL Forté unless otherwise stated on Engineering Drawings, or similar approved. 200 µm nominal thickness. UV Resistance Category RUB4 to EN 10169-1/2. 40-year warranty (inland areas, i.e. 1km from coast). Colour shall be Goosewing Grey RAL 080 70 05, BS 10A05, unless otherwise stated on Engineering drawings.

9.7 Internal Liner Sheet

The Internal Liner Sheet coating shall consist of Kingspan CleanSafe 15 or equal approved.

Colour to be "**Bright-White**".

Kingspan CleanSafe 120 shall be used where a high level of cleanliness and hygiene is required, and panels are to be cleaned down on a regular basis.

9.8 Insulation Core

The insulation cores shall consist of Quadcore or similar approved closed cell, CFC free and non deleterious insulation with insurance certified LPCB and FM Approval.

Quadcore Insulated panels tested and certified to Loss Prevention Certification Board (LPCB) property insurance standard LPS 1181 Part 1:Issue 1.2 'Series of Fire Growth Tests for LPCB approval and listings of construction product systems' Grade EXT-B when installed to the appropriate specification.

The panels shall be tested to: #

- FM 4471 Class 1 panel roofs.
- FM 4880 Class 1 fire rating of building panels or interior finish materials.
- FM 4882 Class 1 interior wall panels in smoke sensitive occupancies.

Roof and Wall Cladding shall be installed fully in accordance with the manufacturer's instructions, using all appropriate butyl rubber sealants, overlaps, fasteners, main panel fixings, stitching screws, foam fillers, gutter brackets, parapet flashings, ridge flashings, etc.

9.9 Fasteners

All primary fasteners shall be the high threaded type, manufactured from Carbon Steel, anti-corrosion coated and fitted with a 16mm diameter bonded stainless steel washer and colour matched plastic cap. Sufficient fasteners shall be provided to withstand all wind forces specified in Eurocode I.S. EN 1991-

1-4:2005 and to comply with manufacturer's recommendations. The design and calculation of fastener spacings shall be carried out by the Cladding Contractor and shall be subject to the approval of the Engineer.

Side laps and flashings shall be stitched with carbon steel stitching screws complete with 14mm diameter bonded stainless steel washers.

9.10 Flashings

All external pressed metal flashings shall be made from 0.7mm thick colour coat HP200 coated steel to match the outer sheet of the composite panel. All flashings shall be weather sealed at laps and along their full length by butyl rubber sealant tape ref. IDL 0311 as specified in the manufacturer's instructions for laps in the panels.

The Cladding Contractor shall provide for all necessary flashings around openings in the cladding. The positions of such openings are indicated on the tender drawings. All cleader angles etc to support flashings shall be provided by the sheeting suppliers/installers.

9.11 Drawings

The Contractor shall prepare drawings for roof and wall cladding, for approval by the Engineer. Largescale details shall be prepared for all accessories such as flashings, ope trimmers, upstands, etc. The cladding Contractor shall liaise with the structural frame Contractor in relation to the confirmation of all structural details and dimensions.

9.12 1-Hour Fire Resistant Wall Construction in Boundary Condition

The walls, which must retain their integrity and load bearing capacity to prevent a fire spreading to adjacent buildings or beyond the relevant boundary, are as indicated on the drawings. One-hour fire resistant construction (in accordance with LPCB, FM and BS 476 Part 22) is required for these walls.

The overall stability of the external wall in a fire is achieved by designing the portal column and foundation to provide sufficient rigidity to resist a rafter collapse in accordance with the Steel Construction on Industry publica on - The Behaviour of Steel Portal Frames in Boundary Conditions (2nd Edition).

The portal column base is connected to the foundation by means of a base plate with 6 No. holding down bolts and angles laid out as shown on the Engineering drawings. The distribution of the 4No. bolts around the outside flange of the portal column is designed to prevent rafter collapse in fire pulling the columns inwards.

This fixed connection is capable of resisting the forces and moments generated by the deflection of the rafters while maintaining the integrity of the portal columns and the walls in boundary conditions.

The column is fire protected by means of intumescent paint from ground floor level to the top of the column in order to prevent failure of the column during the fire. The rafter remains unprotected (unless noted otherwise on the Engineering drawings).

The wall cladding will be Kingspan KS1000 MR 'FIRESAFE' (horizontally laid) wall panel or equal QuadCore composite panel with LPCB certification and FM approval.

The roof cladding will be Kingspan KS1000 RW 'FIRESAFE' roof panels or equal QuadCore panel with LPCB cer fica on and FM approval.

Both of these cladding types will, as part of an overall construction, remain intact for 1 hour in accordance with LPCB, FM and fire tests in accordance with BS 476-22: 1987 Fire Tests on Building Materials and Structures.

Horizontally Laid Cladding:

The cladding is fixed directly to vertical top-hat sections at 1500mm centres. These top hats are supported by single span sheeting rails fixed to the portal columns and are fixed at the top of the wall

to a fire protected eaves support member (100mm x 150 hollow section, unless noted otherwise on the Engineering drawings).

This hollow section is designed to support the weight of the wall sheeting and top-hats in the event of a fire. The lower sheeting rails are slotted and shortened to prevent distortion of the rails and consequent distortion of the wall sheeting in the event of fire.

Vertically Laid Cladding:

The cladding is fixed directly to horizontal sheeting rails at 1500mm centres. These sheeting rails are single span rails fixed to the portal columns. The cladding is fixed at the top of the wall to a fire protected eaves support member (100mm x 150 hollow section, unless noted otherwise on the Engineering drawings). This hollow section is designed to support the weight of the wall sheeting in the event of a fire. The lower sheeting rails are slotted and shortened to prevent distortion of the rails and consequent distortion of the wall sheeting in the event of fire.

Over cladding of existing roofs using single skin sheeting panels – use compatible cladding with matching profile – refer to Kingspan Data Sheet on approved installation methods. Cladding panels for over sheeting to be KS1000RW roof panels with double sided single skin steel sheets or similar approved.

10. WATERMAIN

10.1 General

All watermain systems shall comply with current Uisce Éireann Codes of Practice and associated Standard Details for Water Infrastructure:

IW-CDS-5010-01 Quality Assurance (QA) Design Requirements Manual
IW-CDS-5010-02 Quality Assurance (QA) Field Inspection Requirements Manual
IW-CDS-5020-01 Water Infrastructure Standard Details
IW-CDS-5020-02 Code of Practice for Water Infrastructure

All new water infrastructure shall be designed and constructed in accordance with Document IW-CDS 5020-03 Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2), associated Standard Details, Civil Engineering Specification for the Water Industry, 8th Edition (CESWI) published by the Water Research Centre (WRC), and I.S. EN 805 (Water Supply – Requirements for Systems and Components Outside Buildings).

10.2 Materials

All materials used in the construction of the drainage system shall bear CE marking in accordance with the EU Construction Products Regulations (No. 305/2011-CPR).

Materials/fittings to be used in the works shall be suitable for use in contact with water intended for human consumption so as to achieve compliance with SI 122 of 2014, European Union (Drinking Water) Regulations 2014.

10.3 HDPE

uPVC pipes shall not be used on water supply networks.

Watermains shall be High Density Polyethylene (HDPE), unless noted otherwise.

The diameter of the watermain shall be as stated on the Engineering drawings.

HDPE pipes shall be blue in colour. HDPE pipes shall be of Type PE-80 and have an SDR-11 or SDR-17 rating.

They shall conform to I.S. EN 12201: Part 1 and Part 2 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure – Part 1, General, and Part 2, Pipes) and I.S. EN 12201-3 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure – Part 3: Fittings).

10.4 Trenches

The excavation for trenches shall be of such depths and widths as will allow the pipes to be properly laid with adequate cover at highest points. The bottom shall be graded from point to point to that of the grade for pipelines as specified and shown on the drawings and making due allowance for the thickness of beds. Pipes shall be laid on a 100mm bed of fine-grained material consisting of sand, gravel or soil passing a 9.5mm sieve.

Equal material shall be placed around and over the pipe for a cover of 100mm. Selected fill, free from stones greater than 25mm in size, rubbish and tree roots, vegetable matter and lumps of clay greater than 75mm in size shall be used to fill the next 300mm.

Watermain pipes shall have a minimum cover of 1000mm. Refer to Uisce Éireann Standard Details for exact backfill specification.

In filling in the trenches, great care is to be exercised so as not to disturb the pipes. The whole of the filling is to be carefully and thoroughly consolidated and rammed, water being added as necessary and any depression in the finished surface over drains to be made up before the Contractor leaves the site. The use of a mechanical rammer will not be allowed within 450mm of any pipe.

10.5 Pipe Laying

Each pipe shall be carefully examined on arrival. Any defective pipes shall not be used and shall be segregated and marked in a conspicuous manner. Pipes shall be laid in a straight line and to even gradients as shown on the drawings. Great care shall be exercised in setting out and determining the levels of the pipes and the Contractor shall provide suitable instruments and set up and maintain all sight rails, boring rods and benchmarks, etc., necessary for the purpose.

All pipes shall be kept free from earth, debris superfluous cement and other obstructions during laying and until the completion of the contract when they shall be handed over in a clean condition.

Pipes shall be laid with sockets leading uphill and shall rest on solid and even foundations for the full length of the barrel. Socket holes shall be formed in the foundations as short as practicable but sufficiently deep to allow the pipe jointer room to work right around the pipes.

10.6 Pipe Jointing

Joints shall be formed by Butt Fusion welding (unless noted otherwise on the Engineering Drawings) in accordance with BS ISO 12176 (Plastic Pipe Fittings – Equipment for Fusion Jointing Polyethylene Pipe Systems – Part 1 Butt Fusion).

Electro-Fusion Welding will only be allowed if expressly noted on the Engineering Drawings, and through consultation and agreement with the Irish Water Field Engineer, as appropriate.

10.7 Pipe Anchorage

Concrete anchors blocks shall be provided on water mains at dead ends, tees, bends of greater curvature than 22 degrees and at both ends of a sluice valve chamber.

Anchor blocks shall encase the pipe in concrete to a minimum thickness of 150mm all around and shall be a minimum length of 600mm.

10.7 Sluice Valves

Sluice Valves shall be double flanged with ductile iron resilient seal gate valves, suitable for use in Water Mains. They shall comply with the requirements of BS 5163, Part 1 and 2 and I.S. EN 1074, Part 1 and 2, and they shall have a CE Marking in accordance with the EU Construction Products Regulations.

The depth of the sluice valve stem cap, or the top of an extension spindle, shall not be less than 250mm below the finished ground level, and no valve stem cap or spindle cap shall be greater than 350mm below ground level.

10.8 Hydrants

Hydrants shall comply with the requirements of I.S. EN 14339, I.S. EN 1074: Part 6 and BS 750. Fire Hydrants shall be Type 2 and shall have an 80mm diameter flange, PN16 rated. The hydrant shall incorporate a screw-down gate valve, underground, "guide to head" type, with a false spindle cap. The hydrant shall incorporate an outlet connection (threaded, flanged, bayonet, etc.). The outlet type shall be confirmed with the Fire Authority prior to commencement of the works. The outlet shall be provided with a cap and iron chain. The surface of the hydrant shall be blue, and it shall be protected from corrosion by a coating in accordance with WIS 4-52-01 or I.S. EN 14901.

The maximum depth of a fire hydrant valve from the cover to the valve spindle should be 350mm. The top of the hydrant spindle should be a minimum of 75mm and a maximum of 225mm below the finished surface of the footpath. The hydrant outlet should not exceed 350mm below the finished ground level.

10.9 Air Valves and Stopcocks

Air valves shall be approved types, of ductile iron to I.S. EN 1563. Stopcocks shall comply with BS 1010. Refer to Uisce Éireann Codes of Practice and Standard Details for exact specifications.

10.10 Chambers

Chambers for sluice valves, hydrants and stopcocks shall be as shown on drawings. Chambers for stopcocks shall comply with BS 1185: 1963. Chambers can be constructed of precast concrete or of

high-density blockwork, complete with a base concrete slab to dimensions as per Standard Details. Alternatively, proprietary prefabricated Chamber units may be used, subject to the approval of the Uisce Éireann Field Engineer.

10.11 Surface Boxes

Surface boxes shall comply with BS 5834 (Surface Boxes, Guards and Underground Chambers for the Purposes of Utilities – Part 2 – Specification for Surface Boxes) and shall be of appropriate grade.

Surface boxes shall be embedded in mortar on the chamber walls, and where the chamber is located other than on a foot path, driveway or carriageway, shall be surrounded by 150mm concrete, 100mm thick.

10.12 Indicator Marker Plates and Posts

Hydrants, air valves and sluice valves shall be located by indicator plates shall be single hydrant indicator plates with fixed black letters complying with BS 3251 except that the plates shall be white. Air valve and sluice valve indicator plates shall comply with the specification for single hydrant indicator plates with fixed letters in BS 3251 except that they shall be coloured white, and instead of the letter H, shall bear the letters A.V. and S.V. respectively as approved. Where market posts are used they shall be concrete complying with I.S. EN 206, to conform to IS 162.

10.13 Testing and Commissioning

After the pipes have been laid and jointed, the following steps are required for the commissioning of the water mains:

- Cleansing of pipes.
- Pressure testing.
- Swabbing after testing.
- Disinfection.
- Disposal of Water.
- Flushing.
- Water Quality Sampling and Testing.
- Connection to the Water Network.

Before undertaking these activities for the commissioning of the water mains, the Developer shall submit a method statement for the review and approval of the Uisce Éireann Field Engineer, prior to commencing these steps for the various stages of testing, swabbing, disinfection, water quality sampling and for the disposal of water, etc.

The whole of the water supply system shall be tested for water tightness and straightness and flushed out and sterilised to the satisfaction of and in the presence of, the Engineer and the Irish Water Field Engineer. Pipe work shall be tested under a pressure of 1.5 times class static pressure in sections agreed with the Engineer:

- (a) After haunching and backfilling.
- (b) After completion of the work.

All pipework shall be thoroughly flushed out before sterilisation. Refer to Uisce Éireann Codes of Practice for specific instructions on the sterilisation process.

The Contractor shall provide all necessary testing apparatus and shall carry out such other tests as are required by the Engineer and the Local Authority/Uisce Éireann and shall re-set, if necessary, until passed. Testing by air pressure will only be permitted when a water test is, in the opinion of the Engineer, impracticable.

The testing of PE Pressure Pipelines shall be carried out in accordance with the requirements of IGN (Information and Guidance Note) 4-01-03, Guide to Testing of Pressure Pipes and Fittings for Use by Public Water Suppliers, October 2015. A formal test report, to the requirements of Uisce Éireann, shall be submitted to the Uisce Éireann Field Engineer giving the complete details of the test that was carried out in accordance with Section 4 of IGN 4-01-03.

11. MANHOLE COVERS AND FRAMES

11.1 General

All frames and covers shall be manufactured from iron and shall comply with European Standard I.S. EN 124 (Parts 1 to 6):2015 Gully Tops and Manhole Tops for Vehicular and Pedestrian Areas, have quality assurance to ISO 9001 and have Third Party Certification to I.S. EN 124.

11.2 Classification

Gully tops and manhole tops are divided into the following classes; A15, B125, C250, D400, E600 and F900. The numeric in each class i.e. 250 represents the test load in KN which the cover shall withstand.

11.3 Place of Installation

The appropriate class of manhole top or gully top to be used depends upon the place of installation. The various places of installation have been divided into groups numbered 1 to 6, as listed below. Figure 9a shows the location of some of these groups in a highway environment. A guide as to which class of manhole top or gully top should be used is shown in parentheses for each group.

The selection of the appropriate class is the responsibility of the Engineer. Where there is any doubt, the stronger class should be selected.

Group 1 (min. Class A 15)

Areas which can only be used by pedestrians and pedal cyclists.

Group 2 (min. Class B 125)

Footways, pedestrian areas and comparable areas, car parks or car parking decks.

Group 3 (min. class C 250)

For gully tops installed in the area of kerbside channels of roads (figure 9a) which when measured from the kerb edge, extend a maximum of 0, 5m into the carriageway and a maximum of 0, 2m into the footway.

Group 4 (min. class D 400)

Carriageways of roads (including pedestrian streets), hard shoulders (figure 9b) and parking areas, for all types of road vehicles.

Group 5 (min. class E 600)

Areas imposing high wheel loads, e.g. docks, aircraft pavements.

Group 6 (class F 900)

Areas imposing particularly high wheel loads, e.g. aircraft pavements.

12. PAVING

12.1 Cobble-Lock Paving

Construction shall consist of approved concrete cobblesetts as manufactured by Roadstone to match existing. Cobble-lock bricks (80mm thick) shall be laid on a 50mm/60mm thick bed of semi dry grit/sand/cement mix 3 : 3 : 1 on the existing concrete slab. Soldier course to be laid in accordance with the Engineering drawing – all soldier courses to be set on mortar and to be haunched in concrete both sides. All cobble-lock work to be surface gritted/sanded and plate vibrated to achieve a solid form. All new paving to match existing paving – samples to be delivered to site and set in position for approval.

All existing 'sound' cobble lock to be power hose cleaned, de-mossed and re-gritted and sanded and passed over with vibrating plate vibrator. All power-hose cleaning to be carried out without causing splash damage to surrounding surfaces.

12.2 Concrete Footpaths

150mm thick concrete footpaths cast in 3m x 1.5m bays laid to falls and cross falls with approved spacers/separation screeds.

A142 mesh reinforcement to be placed 50mm from top of path surface and to be dowel lapped with T10 diameter steel dowel bars at every joint. Concrete grade C28/35 with vibrating screed or poker, surface finish to be 'brushed finish' in the direction of fall. 100mm bullnose steel trowel finish around each bay and neat finish to all joints and kerbs.

13. PLASTER AND PLASTERBOARD

13.1 Sand

Sand for renderings shall conform to I.S. EN 13139:2013 Aggregates for Mortar, I.S. EN 998-1:2016 Specification for mortar for masonry – Part 1: Rendering and Plastering Mortar and I.S. EN 13914 1:2016 Design, Preparation and Application of External Rendering and Internal Plastering – Part 1: External Rendering.

13.2 Patent Plasters and Plasterboards

The plaster shall be Gyproc Finish Plasters and the plasterboard shall be Gyproc Wallboard, or as otherwise noted, all as manufactured by Gyproc Saint-Gobain, or other equal and approved and used in strict accordance with the manufacturer's printed instructions.

13.3 Materials

All materials shall be delivered to the site in their original packages, bearing the trade name of the material concerned and shall be stored off the ground, under cover and away from all source of damp.

13.4 Proportioning

The materials used for plastering shall be proportioned by volume by means of gauge boxes.

13.5 Working Time

Plastering mixes containing self-se ng materials shall be used within the recommended working me for the mix concerned. Mixes containing cement shall be used within two hours of the first contact with water. Materials, which have started to set, shall not be retempered.

13.6 Mixing

All mixing shall be done on a clean platform or in a clean mixing box or in mechanical mixer. Only water shall be added and no other admixture is permissible.

13.7 Preparation of Base Surfaces

All surfaces shall be cleaned, thoroughly brushed and well we ed before application of finishing. Concrete surfaces shall be free from mould oil.

13.8 Preparation for Rendering and Backing

All surfaces, which are to receive renderings or backings, shall be prepared by scudding consisting of cement and sand in the proportions of 1:2 by volume, forcefully thrown on and le to harden as key.

13.9 Plastering

Plastering on brickwork and blockwork shall be in two coats 13mm total thickness and comprising Sand and Cement Undercoat and Gyproc Finish Plasters.

Plastering on concrete and on plasterboard shall be in two coats 10mm total thickness and comprising Gyproc Bonding Coat and Gyproc Finishing Plasters.

All undercoating and bonding shall be ruled to an even surface and lightly scratched to form a key for finishing coats. All finishing coats shall be finished with a steel trowel to a smooth and even surface.

13.10 Plasterboards Fixing

Plasterboards shall be nailed to base at 150mm centres one way and not more than 600mm centres the other way using 31mm aluminium nails driven flush or proprietary screws.

Joints shall be le with 4mm spacing and staggered. All joints, angles and abutments shall be scrimmed with 90mm wide Gyproc Joint Tape and approved Gyproc joint plasters. Boarding shall be skimmed in two coats (unless noted otherwise).

All plasterboard shall be installed in accordance with manufacturer's instructions.

13.11 Rates to Include

The rates for all work in this section shall include for all necessary temporary rules, temporary supports to risers and the like, temporary screeds and templates, we ng base and for all other preparation to new base surfaces including scudding if necessary.

13.12 External Plastering

Walls to be first scudded and then rendered and floated in two coats work to 20mm in thickness and le ready for a Rough Cast Finish using 15mm material as supplied by Messrs. Roadstone Ltd., or other approved suppliers. Gauge immediately before use with one part of cement as specified to four parts of roughcast.

13.13 Preparation of Surfaces

Surfaces to receive plastering shall be dry brushed to remove all loose particles, dust laitance, efflorescence, etc. and any projecting fins on concrete surfaces shall be hacked off. All traces of mould oil shall be removed from concrete surfaces by scrubbing with water containing detergent and rinsing with fresh water.

Surfaces shall be we ed and re-we ed as required to equalise sec on before the first coat of plaster is applied. In particular, dense hard concrete surfaces shall be we ed and re-we ed as required before bonding plaster is applied.

13.14 Scudding

Scudding shall consist of one volume of Portland cement and two volumes of clean, sharp, coarse sand prepared as thick slurry with P.V.A. or other approved additive and hand thrown on to wall. It shall be left as thrown; but wetted with fine spray when necessary to ensure proper setting.

13.15 Dubbing Out

Dubbing out shall be in the same mix as the subsequent coat and shall not exceed 10mm thick in one application.

14. MECHANICAL & ELECTRICAL

14.1 ELECTRICITY SUPPLY

Details of the existing electrical supply and installation are shown on the attached drawings.

14.2 REGULATIONS

The Electrical Installation shall comply with the 'Safety, and Welfare at Work (General Application) Regulations 2007', Part 3, Electricity. It shall conform with the "National Rules for Electrical Installations" 5th Edition, IS 10101 dated 2020, as issued by the ETCI and any other regulations referred to in this Specification. All equipment supplied and installed shall carry the CE marking in compliance with the following EC directives: Electromagnetic Compatibility (889/336/EEC), Low Voltage (73/23/EEC), Machinery (89/392/EEC).

14.3 SITE VISIT

The Contractor, prior to submitting his tender, shall be deemed to have visited the site and ascertained for himself the means of access thereto and any other factors which may affect his tender, as no claim will be allowed on account of his not having done so.

14.4 CONTRACTOR'S PLANT & EQUIPMENT

All plant and equipment necessary for the completion of the Electrical Installation shall be supplied and maintained by the Contractor. During the Contract Period the Contractor shall at his own expense, take every precaution to safe guard the work and materials and shall be responsible for all accidents and damage which may arise by, from, or in consequence of, neglect of such precautions.

14.5 CHANGES

While the position of lights, switches, sockets, etc., may be assumed to be correct for the purpose of estimate, variations of positions may be instructed with no extra payment allowed, unless such alterations are instructed after completion of the work involved.

14.6 EARTHING AND BONDING

The minimum cross-sectional area of earthing and protective conductors shall be in accordance with TABLE 54A And TABLE 54F respectively of the "National Rules for Electrical Installations". Fourth edition (ETCI Regulations). The installation shall not be neutralised. The system of earthing to be used shall be the TN-S System as Described In FIGURE 31.3, Chapter 31 of the ETCI Regulations. The Contractor shall be responsible for the bonding and earthing of all exposed metal work, structural or otherwise, and the metalwork of any gas or water service, to the earthing termination at the intake position, in accordance with 'The National Rules for Electrical Installations' as issued by the ETCI. In addition a 35 mm² insulated earthing conductor shall be installed connecting the Main Distribution Board earth bar to two (2) No.1200 mm hot-dipped galvanized steel rods of nominal diameter 16mm, spaced 1500 mm apart, and driven in the grassed area close to the outside of the cable intake position. The conductor shall be connected to each earth rod by means of a substantial non-ferrous clamp to B.S. 951. Denso tape shall be used to protect the connection against corrosion. Each rod shall be installed in a Furze PT 100 lightweight inspection pit with a concrete lid. The earthing conductor shall be installed underground in a PVC duct where the cable exits the building to the first earth pit.

All bonding shall have a permanent notice displayed adjacent to it with the wording "Safety Electrical Connection, Do Not Remove". The resistance between any metal to be earthed and the main earth terminal shall not exceed 0.5 Ohms. Separate protective conductors shall be run, independent of trunking and conduit, with circuits to all outlet points.

14.7 TESTING

Insulation and continuity tests shall be carried out during the installation. When the installation is complete, the Following tests will be carried out :- polarity, earth electrode resistance, line earth loop impedance, continuity and resistance of protective conductors, insulation, operation of residual current operated protective devices. All testing shall conform to methods outlined in "National

Rules for Electrical Installations" 5th Edition, Part 6. The Contractor or his Representative shall notify the ER, in writing, of the date he proposes to carry out the tests. The ER shall be present to witness tests specified in the contract and assess the quality and accuracy of the work. A Completion Certificate as prescribed by RECI shall be provided by the Contractor on completion and signed by a suitably qualified person who has carried out the testing.

14.8 ARMoured CABLES

Where cable is specified as Cu/XLPE/LSF/SWA/LSF they shall comprise copper conductors insulated with XLPE Enclosed in an LSF inner sheath and covered with steel wire armour which shall be covered with an LSF outer sheath. Cables shall be 600/1000 volt grade with stranded copper conductors and shall conform to I.S. 273 and BS6724. Cables shall be manufactured by Cable & Wire Ltd or other approved manufacturer.

Cable run on the surface of buildings shall be adequately supported throughout its length. The minimum Supports shall not exceed values recommended by the manufacturers and given in the ETCI Regulations. Cable bends shall not exceed the minimum bending radius specified by the cable manufacturer.

The cable armouring shall be carefully made off in the maker's gland at each entry to cubicle switchboards. To Establish good continuity, an earth tag washer shall be fitted to the gland and a cable linkage used across to the enclosure earthing terminal. Bonding of the metal work for the earthing shall be in accordance with Para 1 2 of this Specification. The exact runs of cables shall be to the approval of the Architect on the site. Where Cables rise on walls or pass through floors they shall be protected by a suitable length of trunking. A cable guard, comprising 1.6 mm thick galvanised sheet steel and formed into a casing with external flanges for fixing, shall be used to protect armoured cable mounted at low levels on walls. Protection shall be to a height of 1500 mm. above ground level.

14.9 LSF CABLES

LSF cable shall conform with the requirements of B.S. 7211.

14.10 PIRELLI GOLD CABLE

Pirelli Gold or equivalent cables shall be two or four core as appropriate with red colored over-sheath, LSZH, of minimum 1.5 sq mm c.s.a. All terminations shall be easily accessible and be protected and sealed with the manufacturers approved glands. All sheathing shall be electrically continuous across all joints. No through joints shall be permitted in any cable. PVC shrouds should be used at all terminations. The Contractor shall be required to carry out insulation tests both before and after the sealing glands are fitted. Firestop penetrations with Hilti fire stop filler Ref: CP 615.

14.11 SILICONE HEAT-RESISTANT CABLE

Silicone heat-resistant insulated cable shall conform with the requirements of I.S. 202 and VDE 0250.

14.12 FLEXIBLE CORDS

ALL flexible cords shall be PVC Insulated & Sheathed Heat Resistant complying with B.S. 6141 and shall be of High conductivity tinned copper conductors of the required cross sectional area as detailed hereunder:-

- a. Luminaires
3 core 1.5 mm sq minimum heat resistant circular flexible cord. Colour of sheath to be white. Metal casings shall be bonded to the protective conductor.
- b. ExtractFans, Automaticflushingunits
Heat resisting flexible cable. Colour of sheath to be white. Size to suit individual loading and local protection.
- c. HandDryers
Three core 2.5 mm sq heat resistant white circular flexible cable.

- d. Waterheating
Three or five core, as appropriate, 2.5 mm sq heat resistant white circular flexible cable.
- e. HeatingSystem
Wiring for pumps, motorised valves, thermostats, fans, and temperature controllers to be not less than 1.5 sq mm heat-resistant insulated flexible cable.

MECHANICAL SERVICES

14.13 COMMISSIONING

The Contractor shall carry out full and complete commissioning of all water systems and all air systems which form part of this Contract. The Contractor shall include for commissioning of all plant items that appear in the Plant Schedule by their respective suppliers who shall provide commissioning certificates for all of the plant items.

The Contractor shall include for the installation of test points generally where shown on the drawings and any other test points that may be required to properly commission all of the systems. The Contractor shall include for sealing up test points after commissioning as appropriate. The Contractor shall take adequate care and precautions in regard to the positioning of test points to facilitate the commissioning procedure. The Contractor is also asked to take particular note of the locations of commissioning valves as well as paying attention to the manufacturer's requirements in this regard.

14.14 RECORD DRAWINGS

The Contractor shall be required to produce final record drawings of the Mechanical Installation, for inclusion in the Safety File, for hand over to the Client prior to the agreement of the Final Account. The Contractor shall be required to submit one copy of the contents for the Safety File to the ER for approval prior to general issue. The Contractor shall be required to commence preparation of record drawings at the commencement of contract. The record drawings shall thereafter be updated at least fortnightly until the Contract completion or otherwise to keep in line with the general progress of the installation on Site. The ER will reserve the right to suspend payment if the Contractor is found lacking with regards to this particular item. The Contractor shall include for three sets of final record drawings which have been approved by the ER for submission to the Client within one month of practical completion.

14.15 TEST CERTIFICATE

The Contractor shall complete a test certificate for each element of pipework or ductwork tested during the contract duration. Test certificates shall be retained for insertion within record manuals at Contract completion. Test certificates must be signed by the Contractor or Mechanical foreman on site and by a party nominated by the ER. Each test certificate will identify by adequate means the element of pipework or ductwork that has been tested, i.e. by building gridlines. Test certificates, which are unavailable or mislaid at Contract completion, may only be replaced by means of new tests.

14.16 PIPEWORK IDENTIFICATION

The Contractor shall ensure throughout the duration of the Contract that all pipework runs are identified on a temporary basis for such matters as direction of flow, service etc. In addition, the Contractor shall ensure that pipework ends are protected from ingress of dirt or other mechanical damage throughout the duration of the Contract.

14.17 SUPPLY AND INSTALLATION

In the interpretation of this specification the term "supply and install" shall be defined as generally including the purchase and procurement of the said item in addition to any activities which relate to the installation of the item until it is properly commissioned and in satisfactory working order and handed over. The following items shall also be specifically included. Procurement costs include all costs associated with the procurement of goods or services including attendance at meetings with suppliers, telephone and facsimile costs, ordering charges, costs associated with seeking estimates and tenders and preparation of estimates and tenders etc.

Delivery costs which shall include any and all costs and charges associated with delivery of plant equipment and materials from the point of supply to the site as above. This shall include any freight charges, shipping charges, insurance costs while in transit or in storage and any surcharges which arise from the need for express deliveries required for the prompt delivery to site of any plant, equipment, materials, goods or services required to complete the contract according to the contract programme.

All costs associated with taking delivery of plant equipment materials, goods and services at the site including any costs associated with on-site storage of same for the duration of the contract. This shall also be taken to include any costs associated with the unloading and unpacking of plant, equipment or materials at the site.

All costs associated with the mechanical protection of all plant equipment and materials if necessary whilst on site for the duration of the contract

14.18 SPECIALIST EQUIPMENT

The Contractor shall include for all costs associated with the provision of all specialist plant, tools and equipment that may reasonably be required to satisfactorily complete the installation.

15. FLOOR, WALL AND CEILING FINISHES

15.1 MATERIALS

Materials shall comply with the following specifications

Nails	IS 105 and BS 1202
Metal lathing	BS 1369
Gypsum plaster lath	IS 41 and BS 1230
Cement	IS EN 197.
Lime	IS 8
Gypsum plaster	IS 27
Sand - gypsum plaster mix	BS 1198, table 1 type 1
- cement and lime mix	BS 1199, table 1
Ready mixed lime and sand	BS 4721
Plasticiser	BS 4887
Sand for screeds	BS 882 table 2, zone 2
Ceramic wall tile	BS 1281 & BS 6431
Clay tiles	BS 1286
Concrete tiles	BS 1197
Vinyl tiles	BS 3261
Wood block flooring	BS 1187
Plasterboard	BS 1230

15.2 WORKMANSHIP

Workmanship shall comply with the following codes of practice

Internal plastering	- BS EN 13914-22016
External rendering	- BSCP 221
Wall tiling	- BSCP 212
Tile and slab flooring	- BSCP 202
Sheet and tile flooring	- BSCP 203
In-situ floor finishes	- BSCP 204
Wood block flooring	- BSCP 201

Surfaces to receive plaster or render shall be thoroughly prepared as appropriate to the finish. The preparation of surfaces and the application of gypsum based plasters shall be strictly in accordance with the recommendations of Gypsum Industries Ltd.

Plasterwork generally shall comply with CP211. Cement shall be Irish manufactured Portland cement complying with I.S. No.1 lime shall be hydrated lime of approved manufacture and comply with I.S.8.1949. Sand shall be clean sharp evenly graded with B.S. 1198 and B.S.119. Water shall be fresh and free from harmful matter. Building paper shall be waterproof as B.S.1521 Class B.

Gyplite plasters supplied by Gypsum Industries Ltd. or equivalent, shall be used in strict accordance with the manufacturer's instructions and comply with IS EN 13279-2 and IS EN 13279-1.

Workmanship shall comply with the following codes of practice

Internal plastering	- BSCP 211
External rendering	- BSCP 221
Wall tiling	- BSCP 212
Tile and slab flooring	- BSCP 202
Sheet and tile flooring	- BSCP 203
In-situ floor finishes	- BSCP 204
Wood block flooring	- BSCP 201

Surfaces to receive plaster or render shall be thoroughly prepared as appropriate to the finish. The preparation of surfaces and the application of gypsum based plasters shall be strictly in accordance with the recommendations of the suppliers of the plaster being used.

Do not commence internal plastering until it is protected at all times from the weather. Premature or localised drying of coatings shall be avoided. No plastering shall be done while the air shade temperature is below 5oC on a falling thermometer and the temperature shall be kept above 4oC for at least 24 hours after setting.

Plastering shall be protected from frost, continued dampness or extreme drying conditions. Materials shall be measured and mixed in clean containers and these shall be cleaned after each use. All tools shall be kept clean and fresh plaster shall not be mixed with old or set plaster. Cement-lime-sand plasters shall be used within two hours of gauging with cement. Gypsum and lightweight plaster shall be used within one hour of adding water. Plasters shall not be re-tempered with water.

Cement-lime-sand plasters shall be allowed to dry out thoroughly before a further coat is applied. Further coats may be applied to gypsum or lightweight plasters as soon as the undercoat has set and developed reasonable suction. On metal lathing the first coat shall be allowed to set sufficiently to prevent breaking the key when the second coat is applied.

All undercoats shall be scratched thoroughly to provide a key for subsequent coats. Unless stated to the contrary all finishing coats in cement-lime-sand plasters shall be finished with a wood trowel and gypsum or lightweight plasters with a steel trowel.

Fair joints, edges, internal and external angles shall be provided at all occurrences. Temporary rules, temporary screeds and templates shall be provided wherever necessary. Finishes shall be worked into beads, dividing strips and the like. Arises on all in-situ finishes shall be pencil rounded. All joints on plaster boards shall be jointed with reinforcing tape. Fair intersections shall be provided on all work specified as being laid to cross falls.

15.3 STORAGE

Hydrated lime, gypsum plaster and cement shall be stored separately from each other in dry ventilated conditions on a raised floor or in suitable silos. Ready mixed sand-lime shall be stored on a clean impermeable surface under weatherproof conditions and the storage period shall be kept as short as possible. Different aggregates shall be stored separately on hard self-draining areas or in suitable hoppers.

15.4 THICKNESS OF RENDER AND PLASTER COATS

The following thicknesses shall be applied unless otherwise specified

<u>External Work</u>	Thickness
Scudding coat	Minimal
Undercoat render	12mm
Finish coat render	8mm
<u>Internal Work</u>	
Scudding coat	Minimal
Undercoat - render	8mm
Finish coat - render	5mm
Gypsum undercoat to concrete blockwork	11.1mm of Gyplite undercoat
Gypsum undercoat to concrete	7.9mm of masonry
Gypsum undercoats	1.5mm of Gyplite "finish"plaster.
Gypsum board finish to plasterboard	Single coat board (one coat work) 3mm
Gypsum hard wall finish to render	1.6mm of Pinnacle plaster
Gypsum finish to plasterboard ceilings	3mm of Pinnacle Board finish

The permitted deviation under a 2m straight edge from the flatness of the finished plaster surface at any point shall not be more than 3mm.

15.5 PLASTER BOARD COVERINGS

Plasterboard coverings shall be either lath or wallboard as manufactured by Gypsum Industries Ltd. or equivalent of the thickness, type and edge profile described. They shall be fixed and finished in strict accordance with the manufacturer's instructions.

15.6 DAY JOINTS / PROTECTION OF WORKS

Day joints shall not be permitted in the plastering. Plastering shall be protected from the frost, extreme drying conditions and continued dampness.

15.7 MISCELLANEOUS MATERIALS

Variations to the materials shown on the drawings (or listed below), may be approved subject to the Contractor submitting full details of his proposals in writing.

16.8 FLOOR FINISHES

Generally workmanship shall conform to B.S.C.P. 201 and B.S.C.P 203. Laying is to be carried out by an approved firm. Operatives must be skilled in laying the materials specified.

15.9 CONDITIONS

Do not lay materials before building is weather tight, wet trades have finished their work, the building is well dried out and all paint work is finished and dry. Before during and after laying, maintain temperature and humidity at levels approximating to those which will prevail after building is occupied.

Do not lay if air temperature is less than minimum recommended by the manufacturers of materials. Do not lay if moisture content of floor is above the max recommended by the manufacturers of materials.

15.10 MOISTURE

Where materials are to be struck to new wet laid substrates.

1. Turn off drying aids for not less than 4 days.
2. Test for moisture content using a hygrometer as in CP 203, Part 2 and BRE digest 16.
3. Take readings in all corners, align edges and at various points over the area being tested.
4. Do not lay until all readings show 75% RH or less.

15.11 ACCLIMATISATION

Store plastic sheets and tiles in air temperature of 18C or more for at least 24 hours immediately beforehand.

15.12 ADHESIVE

Use in accordance with manufacturers recommendations. Remove surplus adhesive from face of materials being laid and any other surface, as the work proceeds

15.13 FLOOR SCREEDS

Surfaces to receive screeds shall be cleaned off and free of debris and dust. For screeds less than 50mm thick the concrete surface shall be mechanically hacked to expose the aggregate, washed and brushed clean. Not less than 12 hours later any surplus water shall be removed and a cement and water grout brushed onto the surface just ahead of the application of the screed.

Where screeds are greater than 50mm thick it is not necessary to expose the aggregate but the same cleaning and grouting procedure should be followed. Where an un-bonded construction is required the screed shall be laid on an isolating membrane. Screeds with a nominal thickness greater than 40mm shall be laid in two layers with the lower layer thickest and neither more than 20mm thick. The upper layer shall be laid and compacted immediately after the first.

Screeds to receive thin sheet or tile finishes shall generally be laid in room sized bays. The position of day joints, if required, shall be to the Employers Representative's approval. Screeds to receive in-situ tile, slab or block finishings or heating elements shall be laid in square bays not exceeding 15 square metres. At least 24 hours shall elapse between the laying of adjacent bays and bays should be laid to break joint.

15.14 RENDER

Plastering shall be protected from frost, continued dampness or extreme drying conditions. Materials shall be measured and mixed in clean containers and these shall be cleaned after each use. All tools shall be kept clean and fresh plaster shall not be mixed with old or set plaster. Cement-lime-sand plasters shall be used within two hours of gauging with cement. Gypsum and lightweight plaster shall be used within one hour of adding water. Plasters shall NOT be re-tempered with water.

Cement-lime-sand plasters shall be allowed to dry out thoroughly before a further coat is applied. Further coats may be applied to gypsum or lightweight plasters as soon as the undercoat has set and developed reasonable suction. On metal lathing the first coat shall be allowed to set sufficiently to prevent breaking the key when the second coat is applied.

All undercoats shall be scratched thoroughly to provide a key for subsequent coats. Unless stated to the contrary all finishing coats in cement-lime-sand plasters shall be finished with a wood trowel and gypsum or lightweight plasters with a steel trowel. Arises shall be pencil rounded.

15.15 PLASTER STOPS

Use Catnic Galvanised Steel Plaster Stop Beads and Angle Beads to BS 2989 and BS 6452 or equivalent. Bead size to depend on plaster thickness. Apply Beads to all wall-to-wall, and ceiling-to-wall junctions.

15.16 DIMENSIONS

Do not start work until socket outlets, duct covers and other fixtures round which materials will have to be cut have been fixed.

15.17 SETTING OUT

Lay tiles or sheets with joints parallel to room axes. All sheets are to be laid out so as to give wide enough margins at walls, and are to be scribed to walls and other edges. No patching will be allowed. Joints are to be overlapped by 12mm and cut in, not butted. The seams are to be welded using hot welding rods in colours to be selected by the Employers Representative to match or contrast. PVC sheeting is to be manufactured by approved firms. Remove all scrap and clean surfaces in accordance with their manufacturer's recommendations.

16. PAINTING AND DECORATING

16.1 MATERIALS

Materials shall comply with the following specifications:

White spirit	- IS 11
Knotting	- IS 16
Gold size	- IS 17
Oil paints	- IS 15,32,115
Priming paints	- IS 18,33,110
Varnishes	- IS 10,103,104
Emulsion paint	- IS 129
Linseed oil	- IS 14,93,94
Turpentine	- IS 12
Wallpaper	- IS 55, 56
Surface preparation of steel for painting Swedish Standard	SIS 05 5900.

Obtain approval from the Employer's Representative for the brands of paint to use. All paints, varnishes, distempers and other surface coatings shall be delivered in sound and sealed containers, clearly labelled by the manufacturer to show the type of product, its brand name, the use for which it is intended and the manufacturer's batch number. Labels shall be printed. Hand or type written labels will not be accepted. No paints other than water based paints and bituminous paint shall be delivered in containers exceeding 5 litres capacity.

Materials for the works may be obtained from different manufacturers but undercoats and finishing coats to be used together must be obtained from the same manufacturer. Materials shall be kept in a clean, dry and well ventilated store and be protected from frost. Paint shall not be thinned or reduced in any way except where specified by the manufacturer. Thinners shall not be added in excess of 5% by volume unless specified by the manufacturers.

16.2 WORKMANSHIP

Workmanship shall comply with the following Code of Practice: Painting of buildings BSCP 231

Painting work shall not be carried out when:

- (1) air shade temperature is less than 5 degrees Centigrade.
- (2) relative humidity is such that condensation is present, or may be expected, on the surfaces or when there is a possibility that it will affect the application and or drying of the coating.
- (3) the moisture content of the surface to be painted exceeds 19%, or the level specified by the paint manufacturer if lower, when measured with an electronic meter.
- (4) heat is liable to cause blistering or other defects.

All brushes, tools and equipment shall be kept in a clean condition and surfaces shall be clean and free from dust or contaminants such as oil during painting. No painting shall be carried out in the vicinity of operations generating dust. Provide a mobile receptacle into which all liquids such as brush cleaning fluid, slops from tins etc. are to be placed. Under no circumstances must brushes be cleaned or painting materials disposed of into gullies, manholes, sinks, lavatories, WC's or any other sanitary fittings. Refuse and flammable residues must be removed from the site.

16.3 APPLICATION AND FILM THICKNESS

Paints shall be applied at the coverage rates specified by the manufacturer for the particular application. Dry film thickness shall correspond to that specified by the manufacturer. The average of the dry film thicknesses taken over any square metre of surface shall equal or exceed the specified

nominal thickness and in no case shall any reading be less than 75% of the specified nominal thickness.

16.4 PREPARATION AND PAINTING GENERAL

Each coat of paint applied shall be tinted so that it can be clearly differentiated from its substrate. This shading shall not be allowed to affect the final colour.

Surfaces shall be prepared in accordance with the recommendations issued by the manufacturer of the paint to be used on the surface. Any materials used in preparing surfaces shall be compatible with the paint to be used, i.e. stopping and fillers. Stopping for clear finished surfaces shall be of a colour to match the finished colour of the adjoining surfaces.

Paint shall not be thinned or reduced in any way except where specified by the manufacturer. Thinners shall not be added in excess of 5% by volume unless specified by the manufacturer. All surface fixed ironmongery (except hinges) on doors and windows and similar fittings shall be removed prior to the commencement of painting and shall be re-fixed on completion. The tender shall be deemed to include for removing and re-fixing the ironmongery and fittings. Any items which it is not possible to remove shall be protected to ensure they are not marked with paint and the Contractor shall ensure that the function of any moving parts of components or hardware is not impaired by paint.

Unless otherwise specified the following surfaces shall not be painted:

- Acoustical tiles and plaster
- Naturally finished metalwork such as bronze, brass, anodised aluminium, stainless steel etc.
- Self-finished equi or fittings such as Formica veneered worktops
- Ceramic and glazed surface
- Floor coverings
- Valves, sprinkler heads, fusible links, thermostats etc.

Items not to be painted shall be carefully masked or otherwise protected during the course of the work and the tender shall be deemed to include for protecting and removing the protection. Each coat of paint must be allowed to dry and be rubbed down with a fine abrasive paper and dusted off before the subsequent coat is applied.

Roller application of paint will not be permitted except for the application of emulsion paint to internal walls and ceilings. Brushes shall be used for cutting in on these areas. Rollers shall be either foamed plastic or short pile sheepskin.

16.5 MOISTURE CONTENT

No paint or decoration shall be applied until the surface and its substrate have dried out to a moisture level acceptable to the manufacturers of the specific products being used.

16.6 SURFACES PREPARATION

Surfaces shall be prepared in accordance with the recommendations issued by the manufacturers of the paint to be used on the surface. Any materials used in preparing surfaces shall be compatible with the paint to be used, i.e. stopping and fillers. Stopping for clear finished surfaces shall be of a colour to match the finished colour of the adjoining surfaces.

Preparatory work listed below shall be deemed to be included in rates for painting. The carrying out of this preparatory work shall not release the Contractor from his obligations to provide a satisfactory painted finish should the paint system applied fail in any way. All wood is to be sanded down smooth prior to the application of any paint, stain or clear finish.

16.7 SOFTWOOD

Apply two coats of knotting to small knots (large knots should already have been cut out), prime with aluminium wood primer and apply extra coat to end grain, stop nail holes or cavities, sand down stopping flush with adjoining surface and prime over stopping, apply filler to grain or surface depressions. If wood is to have a clear or stained finish then the knotting will not be necessary as 'selected' timber will have been used and the stopping shall be chosen to match the colour of the coated wood. The wood shall be primed if the paint manufacturer recommends that a primer be used under his product.

16.8 HARDWOOD

Hardwood to be painted shall be primed with a primer suitable for the type of hardwood. Hardwood to receive a clear or stained finish shall be stopped with a material matching the colour of the coated wood and should be primed if the manufacturer of the paint recommends the use of one.

16.9 STEEL

Pre-primed steel shall have any damage to the primer touched up .

16.10 PREVIOUSLY PAINTED MATERIAL

All loose material shall be removed back to a firm edge. The edge shall be feathered with sandpaper and defects made good with primer, stopping, filling and undercoat to bring up stripped areas level with adjoining surfaces. Surfaces shall then be rubbed down with abrasive paper, washed and allowed to dry.

Clear finished work shall be sanded and washed down and any loose material removed. The timber left bare shall be built up to the level of the adjoining surfaces with as many coats of the finishing material as necessary. Surfaces where the existing finish has deteriorated extensively shall be stripped using either chemical stripper or a blow lamp. The wood must not be damaged or scorched should a blow-lamp be used. Chemical strippers shall be used strictly in accordance with the instructions. The stripped surfaces shall be prepared as for new work.

16.11 PLYWOOD

Plywood shall be primed and grain filled.

16.12 PLASTERBOARD

Any dents or imperfections in the surface shall be filled with a suitable filler.

16.13 PLASTERED SURFACES

All loose dust, plaster splashes and the like shall be removed, dents or imperfections filled and the walls generally lightly sanded and cleaned down to leave a smooth, level and uniform surface.

16.14 CONCRETE

All mould oil shall be removed by scrubbing with water and detergent. Loose dust shall be removed and imperfections shall be filled and sanded down to provide a smooth surface.

16.15 PLUMBING

All exposed metalwork in ducts to be thoroughly wire brushed and painted with two coats of rust inhibiting paint. Pay special attention to the pipe supports in under floor ducts, ensuring that they are completely protected against corrosion.

16.16 GENERAL

All exposed metalwork to be thoroughly wire brushed and painted one coat of rust inhibiting paint and two coats of an approved colour finishing paint. Walls with plastered background finish generally to be prepared and painted with three full coats of Vinyl Silk Emulsion Paint. Ceiling with plastered background finish generally to be prepared and painted with three full coats of vinyl matt emulsion paint.

16.17 INSPECTION

Painting will not commenced until the preparatory work has been completed to the satisfaction of the Employers Representative or his representative. Subsequent coats shall not be applied until the previous coat has hardened, been prepared, rubbed down and similarly approved.

17. DRAINAGE

17.1 GENERAL

All materials which the contractor proposes to use in the construction of the work shall comply with the requirements of the Irish Standard Specification latest publication the material shall be the best of its kind available and to the satisfaction of the Employers Representative. In general a material having the Irish Standard Mark product must be used in preference to a material which does not have it. Concrete and polythene pipes having this mark are available. The Contractor shall be responsible for all below ground sewerage/foul and surface water services and connection of all soil and waste pipe to the existing drainage system.

17.2 MATERIALS

Materials shall comply with the following specifications

Precast concrete pipes and fitting	- IS 6, 166 BS	5911
Field drain pipes	- BS 1194, 65,	540
UPVC pipes and fittings	- IS EN 1402, IS EN 13476, IS EN 23598-1, BS	4660, 5481,
Concrete manholes	- BS 556, IS20, 91, 189	
Manhole covers and frames and gratings	- EN 124	
Manhole step irons	- BS EN 13101	

17.3 PLASTIC PRODUCTS

Un-plasticised PVC pipes and fittings shall comply with BS 4514, 5255, 4660. Where using un-plasticised PVC gully traps and Armstrong Junctions the inlet and outlets must suit pipework and have gratings or covers as required.

17.4 AGGREGATES

Aggregates shall comply with IS EN 13242. The Coarse Aggregate shall be graded between the maximum size and 5mm. It shall be delivered to the site in separate sizes (20mm - 10mm to 5mm where the maximum size is 20mm; and 40mm - 20mm to 5mm where the maximum size is 40mm). Aggregates for use in lean concrete granular base shall consist of gravel 40mm nominal size combined aggregate, washed where necessary and complying with requirements of Standard Reference 3. It is assumed that sieving analysis will be carried out using B.S.S. sieves. Contractor to allow for costs of such tests in his rates.

17.5 HARDCORE

Hardcore for filling shall comply with SR 21.

17.6 GRANULAR BEDDING IN PIPELINE

Bedding material shall comply with WIS 4-08-02 and IGN 4-08-01.

17.7 PIPEWORK

All pipework and associated fittings will be uPVC, Wavin Pipes or equal approved.

17.8 ACCESS JUNCTIONS

Use Wavin 110mm Access Junctions, or equal approved, complete with risers as necessary, frame and cast iron cover.

17.9 JOINTS

All joints to be ring sealed socket joints.

17.10 WORKMANSHIP

Drainage work generally shall comply with BSCP 301, SR 7 and technical Guidance Document H (Building Regulations 1991), and shall comply with the requirements of the local Authority. Work will also comply with the following relevant standards:

BS 5572 : 1978
BS 6367 : 1983
BS 8301 : 1985
BS 5911 : 1982 Part 2

Code of Practice for sanitary pipework
Code of Practice for drainage of roofs and paved areas.
Code of Practice for building drainage
Precast concrete pipes, fittings and ancillary products:
Specification for inspection chambers and street gullies.

Set out the Works to the correct positions, levels, dimensions, gradients and alignments and shall provide all necessary facilities and equipment for this purpose.

Excess excavation below the required levels shall be filled up to the correct level with 1:12 concrete, or as the Employers Representative may require, at the Contractor's expense. The bottoms of excavations must be inspected and approved by the Employers Representative before any further Works are commenced.

Only lay foul and surface water drains and sewers in the same trench where he is either directed to by the Employers Representative or obtains the Employers Representatives approval. Except where specifically stated to the contrary trenches have been measured on the basis of one pipe being laid in each trench. Should the Contractor receive approval to lay more than one pipe in a trench he shall be responsible for any extra costs arising from providing extra supports, staggered backfilling, revised bedding and surrounding, etc. Rates will be revised pro-rata the designed widths and depths of the trenches.

Temporary or permanent supports to pipes such as bricks, blocks, timber etc. shall not be used except where specified. Where a concrete bed is required to pipes a 50mm thick initial layer of concrete shall first be placed across the width of the trench. The pipes shall be laid, jointed and supported on precast concrete blocks which shall be separated from the pipe barrel by 25mm thick softwood packings. Backfilling of the trench shall not be carried out earlier than 36 hours after laying of the concrete.

Excavations shall be backfilled with either selected excavated material or granular material. Selected excavated material shall be dry, clean and capable of compaction to form a stable dense fill. It shall exclude the following

- 1) material from marshes or containing peat, vegetation or perishable matter.
- 2) material which by nature of its physical or chemical composition, frozen state, combustibility or moisture content will not compact to form a stable fill.
- 3) lumps exceeding 150mm in any direction.
- 4) builders rubbish
- 5) organic clays or silts
- 6) chalk or clay which is soft or wet.

Granular material shall comprise natural sands, gravels, crushed rock, concrete slag or hard brick, or well burnt non plastic shale. It shall pass a 75mm ring and shall be suitably graded with sufficient fine material to fill voids and produce a dense stable mass when compacted. Gravel in beds and surrounds shall be single sized irregular course aggregate complying with BS 882 table 1 and of the following nominal size.

Pipes not exceeding 500mm diameter 10mm
pipes over 500mm diameter 20mm

Gravel beds shall be well compacted and shall extend the full width of the trench with sufficient material at the sides to permit the pipe to be worked into the material and be firmly supported true to level and line. When the level and line are satisfactory the side filling shall be placed in 75mm layers and compacted before the covering to the pipe is placed in 75mm layers and thoroughly compacted ensuring that all spaces between the trench sides and pipe are filled. Drainage bed widths are in all cases the minimum required and the rates quoted by the Contractor in his Schedule of Rates are those which will be paid for the work regardless of what width the Contractor chooses to excavate the trench to.

The starting levels from which excavation items are described in the drawings are measured. The Contractor shall be responsible for any extra costs arising from his decision to choose a different starting level, should he do so.

Flexible mechanical joints shall be formed in accordance with the manufacturer's instructions. Joints to cast iron pipes and fittings shall be made with a synthetic seals.

Rigid joints to concrete or clay ware pipes and fittings shall be made with synthetic seals placed into the socket. Pipes passing through walls or foundations shall have sleeves around them to allow a clearance around the pipe. The first 300mm of backfilling above the crown of the pipe shall be compacted by hand. The remainder of the backfilling shall be placed in 150mm layers and mechanically compacted. Granular material shall be used in trenches under buildings or paved areas. Elsewhere, selected excavated material shall be used.

17.11 SCOPE

All drainage work up to and including gullies and connections to W.C's soil vent pipes and rainwater conductors is to be executed in accordance with this specification.

17.12 ORDER AND EXECUTION OF THE WORK

Before commencing work on the site the Contractor shall submit for approval a programme for the execution of the works, which shall allow for carrying out of drainage works after formation level is achieved.

17.13 NOTICES

Before commencing any of the proposed works, notify the Employers Representative and any other affected authority of intention to proceed with the works and shall satisfy the Employers Representative of each authority as to precautions to be taken to preserve all underground or over ground services in the vicinity of the works. He shall comply with all statutory regulations, pay any fees arising therein and serve such notices as are required.

17.14 SETTING OUT

At the commencement of the works and before the existing ground is disturbed the contractor shall signify his agreement to the correctness of the existing ground levels as indicated on the drawings. After setting out any drainage works which are related to existing levels but before the ground is disturbed, the existing ground and other relevant levels shall be checked in order that the details of the proposed work may be confirmed or if necessary amended.

17.15 LOCATION OF EXISTING SERVICES

Ascertain the position of their apparatus and allow for checking the correct nature and location of all services by trial holes or other means before commencing general excavation. Diversion of existing services will only be paid for where the Employers Representative orders previously unforeseen work necessitated by the permanent construction.

17.16 CONTROL OF TRAFFIC TEMPORARY SIGNS, ETC

If required, erect and maintain on the works and at prescribed points on the approaches to the works, traffic signs for the direction and control of traffic to the satisfaction of the Employers Representative including the provision of approved adequate illumination.

17.17 TEMPORARY WORKS

Provide, maintain and remove on completion all temporary works for the proper and safe construction of the permanent works and for the protection and security of all adjoining property including services, watercourse, footpaths, fences and the like. All vehicle and pedestrian access to property shall be maintained in a safe condition.

17.18 COMPLETION OF DRAINAGE WORKS

Before any general excavation or filling is commenced on the Site, sufficient permanent and temporary drainage works shall be carried out to provide adequate outfalls for all surface and subsoil water, including watercourse and pipes which will be severed by the execution of the works. Where necessary provide pumps or other methods to maintain outfalls at all times. During construction and on completion all drains, manholes, catch pits and gullies shall be kept clean and free from accumulation of silt, etc. Any sub-soil drain, jointed pipe, manholes, catch pit or gully which cannot be cleaned shall be replaced at the contractor's cost.

17.19 CONNECTIONS TO EXISTING SEWERS

Before entering or breaking into an existing sewer give notice of his intention to the appropriate authority so that their representative can be available for supervision of the work. Where pipes are to be connected to existing manholes, channels shall be formed in the benching, the chamber walls cut at the correct level and the new pipes built in together with any backdrops necessitated by the difference in level of the existing and new pipes.

Where a new manhole is to be constructed on an existing sewer, allow for locating the sewer and checking its level before commencing to construct the drain run to be connected thereto. Where pipes discharge into watercourses the ends of the pipes shall be supported and the banks protected by concrete head walls constructed so as not to impede the flow in the channel. When working in existing sewers, and watercourses provide for dealing with existing flows to enable the new work to be properly completed.

17.20 GENERAL EXCAVATION FOR PIPE LINES, MANHOLES, CHAMBERS, ETC.

Except where headings are specified, permitted or otherwise ordered the ground shall be excavated to the lines and depths shown on the drawings or to such other lines and depths directed by the Employers Representative. Trenches shall be of sufficient width to enable the pipes to be properly laid and jointed and shall be excavated for full depth with vertical sides. Excavations taken out to a greater depth than necessary shall be filled to the required level with concrete at the contractor's own cost. Where a concrete bed or surround is required to the pipeline, manhole, A.J. etc., the excavation shall be taken out to the overall dimensions of the bed or surround. Any additional excavation shall be filled with concrete at the contractor's own cost.

Where pipes occur at or below existing ground under fill, they shall be laid before placing the fill material unless otherwise directed by the Employers Representative. Excavation at or near the toe of cutting or embankment slopes shall be carried out in such a manner that there is no excavation into the slope for working space and the trenches shall, unless the Employers Representative agrees to their being left open for a longer period, have the pipe line completed and be backfilled at the end of each day's work.

Surplus excavated material shall be promptly removed to tip off site and spoil heaps or uncollected rubbish shall not be left along trench lines on any site. Whether excavating by hand or machine, prevent disturbance or softening of wet fine grained soils such as clays, silts and fine sands in the trench bottom, by proper drainage and by placing a blanket of coarse sand and gravel or other approved granular bedding material on the virgin formation as soon as it is uncovered. No traffic shall be allowed in the trench bottom until this blanket is in place. In very soft ground this blanket shall be additional to the normal bedding required for the pipes. Peat or boggy material before formation level shall be removed and replaced by sand or other approved stable filling materials.

17.21 WATER IN TRENCHES

Trenches shall be kept free from water and shall be shaped to prevent any accumulation of water either in or adjoining the excavation of the spoil therefrom. Provide any temporary drains, sumps, pumps, etc. that may be necessary and shall at all times during the contract, prevent silt, oil or other contaminating material being discharged into existing or completed drains, watercourses or soak ways. Catch pits or other means necessary to comply with this requirement shall be provided and kept clean by the contractor at his own cost.

17.22 ROCK

The term shall be taken to mean any material met in excavation which is of such size or position that it can only be removed by means of wedges, compressed air or other special plant or explosives. Soft surface rock or the soft top rock or rock easily removable shall be classified and paid for at normal excavation rates. The Employers Representative's decision in this is binding. The item included in the Appendix D for hard rock excavation is provisional and only that quantity actually removed will be paid for as an extra on normal excavation. Where rock is met in trenches it shall be excavated and trimmed to prescribed level of underside of the pipeline. Rock excavation shall also be deemed to include solid boulders of 0.25 metres or over in volume.

17.23 REFILLING TRENCHES

The initial layer of backfill material, shall not be thrown directly onto the pipes but be carefully placed and consolidated in thin layers by hand up to at least 300 above the top of the pipe or special surround. Backfill around pipes, including concrete or other special materials shall be carefully packed under and around the pipes. Filling above the initial layer shall be deposited and compacted in layers not exceeding 225 loose depth. Great care shall be taken in all cases to ensure that the filling is fully compacted and rammed against the sides of the trench.

17.24 GRANULAR BEDDING TO FLEXIBLE JOINTED PIPES

The construction of beddings for flexible jointed pipes shall be generally in accordance with the recommendations of Special; Report No. 35 issued by the British Ministry of Public Building and Works (HMSO) and Technical Bulletin No.1 Construction of Flexibly Jointed Concrete Pipelines. Standard Reference 27. Bedding shall be well compacted and brought true to line and level providing a depth not less than the values given in the detail drawings. Side fill shall be thoroughly compacted and completely fill the space between the sides of the trench and the pipe.

17.25 LAYING AND JOINTING PIPES

Set up and maintain bench marks on site. Sight rails shall be set up for all lines of drains. Sight rails shall be of wrought deal at least 150 x 25 securely fixed to two substantial uprights firmly driven into the ground. Sight rails shall be erected not more than 45m apart and at each change of gradient line and level.

Pipes shall be laid true to line and level each pipe being separately bonded between sight rails. All pipes shall be laid with the whole of the barrel of the pipe evenly and solidly supported by the bedding material with shaped holes to receive sockets or jointing collars.

17.26 PIPES WITH FLEXIBLE JOINTS

Flexible joints shall be made to the manufacturer's instructions with 12mm gap between the end of the spigot and back of the adjoining socket, (or spigot where jointing collars are used). The exterior of the joint shall be sealed with stone free cohesive soil or equivalent material to prevent the entry of granular material into the joint.

Jointing rings shall be carefully stored with the separation of natural and synthetic rings and those supplied by different pipe manufacturers. Completed pipelines shall have a smooth internal bore free from lipped joints, jointing or other material. Where waterlogged soil conditions are encountered the final excavation of the trench shall not be carried out until the contractor is in a position to place the granular bed.

When each length has been tested and approved the concrete haunching as required shall be placed. The concrete shall be carefully packed under the pipe barrels so that no space is unfilled.

17.27 TESTING OF PIPELINES

All sewers, manholes, chambers and other work shall be absolutely watertight. In order to make sure of this the sewers shall be subjected to a water test. No sewer shall be covered up until it has satisfactorily passed the test. The pipes shall be tested in sections (e.g. between manholes). Each section shall be tested by filling with water and testing to a head of not less than 1.0 metre and not greater than 2.4 metres. The head shall be maintained for 30 minutes. Any pipes or joints which show signs of leakage or sweating during the period of test shall be taken out and replaced or re-jointed at the contractor's expense until completely watertight. In the case of large sewers of internal diameter 450mm or over the Employers Representative may permit an air test for the water test. A suitable air pressure shall be built up with a tube. Pressure shall be built up to 150mm for 5 minutes without a drop of 25mm on thermometer tube the test will be regarded as satisfactory. If the pipeline fails under the air test a confirmatory water test shall be applied without extra cost on the contract.

Invert channels shall form a vertical transition between the gradients of the incoming and outgoing sewers and where there is a change in horizontal direction of these sewers, the channel shall be curved in plan to the largest possible radius. The channel shall be accurately finished to a smooth curved surface with purpose made channels. The sides of the main channels above half diameter shall be vertical up to the level of the soffit of the inlet pipe. Benching shall have a minimum fall of 25mm from back to front and 25mm radius nosing to the channel, the whole of the benching and vertical sides of the channel to be finished in 1: 3 cement mortar rendering.

Rendering shall be finished to a smooth hard surface with a steel trowel in 19mm of 1: 3 cement mortar. Where detailed, galvanised step irons to B.S. 1247 are to be fixed in manhole and shaft walls.

Manhole covers and frames to be of the pattern specified and shown on the Drawings. Frames to be bedded in 1 : 3 cement mortar on 8 No. concrete bricks with the surface flush with the existing or proposed adjoining ground levels. Normally acceptable tolerances will be within the range of true level and 6mm low. The covers and frames shall be coated before delivery by hot dipping in an approved bituminous material. Any damage to the bituminous material during transit or fixing shall be made good. Two sets of manhole lifting keys for each type of manhole shall be provided and handed over to the Employers Representative's representative as soon as fixing of the covers commences.

Section C – Detailed Requirements

Summary of Works

This project consists of the refurbishment of existing Lean-To offices in Gormanston Camp, Gormanston, Co. Meath.

The works are located within the compound area that is adjacent to Hangar No.1 and include the refurbishment of existing offices and ablutions to provide permanent offices and ablutions for Barrack Foremen of Works (BFW) staff within Gormanston Camp.

A summary of the works is as follows:

- Disconnect all existing electrical and plumbing services.
- Removal of all external and internal doors and windows.
- Demolition of existing block and concrete walls and lean to roof.
- Excavation of new internal and external foundations.
- Construction of new internal and external foundations.
- Construction of new lean-to roof including all new cladding, associated flashings and rainwater goods.
- Construction of internal and external block walls to form offices, kitchenettes, ablutions and openings.
- Installation of new electrical, mechanical and wastewater services.
- Installation of new floor coverings to offices, hallways and ablutions.
- Installation of 2no. new kitchenettes, sanitary ware and fittings and all internal and external joinery items.
- Painting of internal and external walls.
- Testing, commissioning and certification of all M&E and waste services.
- Cleaning of all areas used during the completion of the works.

General Notes

All dimensions and levels to be confirmed on site.

All levels relate to TBM 10.00m (Excluding FFL).

All concrete is to be Grade C30/37 U.N.O.

All Lean Mix Concrete Blinding is to be Grade C12/15.

Concrete to be placed in accordance with the associated specifications and BS8110.

The Contractor shall provide all necessary temporary works and shoring during the course of the works.

The design, installation and maintenance of temporary works shall be the responsibility of the Contractor unless detailed in the drawings.

Strength of all blockwork to be 7.5N U.N.O.

All concrete lintels shall have a minimum 225mm bearing each side of an opening.

All steel beams shall have a minimum of 450mm bearing each side of an opening.

All surplus materials and any materials arising from the alterations and demolitions are to be removed from site via a registered waste disposal contractor.

1. DEMOLITIONS AND ALTERATIONS

Note: Drawing T-02 to be referred to for all demolition and alteration works.

The Contractor shall carry out the following demolitions and make good in preparation for new works.

Existing Double Palisade Gates

The Contractor shall remove the existing Double Palisade Gates located in the North side of the Perimeter Fence. The existing Double Palisade Gates are to be stored and reinstalled at the end of the works.

The Contractor shall remove sections from the existing perimeter palisade fence to facilitate the reinstallation of the Double Palisade Gates.

The sections that are removed shall be reinstalled in the original location of the Double Palisade Gates.

Existing Manholes

The Contractor shall excavate and remove the 2no. obsolete manholes adjacent to the existing Double Palisade Gates on the North side of the yard area.

The Contractor shall fill and make good all excavated areas.

Existing Large Concrete Walls

The Contractor shall demolish and remove the 2no. existing large Concrete Walls located at the North and South ends of the Lean-To Structure.

Existing CCTV, Pipes and Services

All existing CCTV, pipes and services located at the North Double Palisade Gate are to be relocated.

Lean To Structure

The Contractor shall disconnect all existing electrical and plumbing services.

The Contractor shall remove and dispose of all existing external cladding.

The Contractor shall remove and dispose of all existing external doors and windows.

The Contractor shall remove all existing roof and wall cladding along with all associated structural steel supports, columns and timbers.

The Contractor shall remove and dispose of all steel roof trusses.

The Contractor shall remove and dispose of all existing 200 x 125 steel columns.

The Contractor shall remove and dispose all existing internal walls and allow for temporary propping as required.

The Contractor shall remove and dispose of all existing internal raised timber floors.

The Contractor shall remove and dispose of all existing internal doors, frames, architraves and skirtings.

The Contractor shall remove and dispose of the raised timber floor in Room 5.

The Contractor shall remove all existing reinforced concrete floor slabs and timber floors.

The Contractor shall remove and dispose of the existing ground beam.

The Contractor shall remove and dispose the existing reinforced concrete foundations and backfill for new foundations.

The Contractor shall remove and dispose of the high-level GRP cladding on Hangar 1 ready to receive new Perspex cladding and associated guttering and flashings.

Strip Out of Electrical and Plumbing Services

The Contractor shall strip out and dispose off-site all electrical items and cabling including, conduits, fittings.

The Contractor shall strip out and dispose off-site all existing domestic hot and cold-water services piping and sanitaryware.

Bloc Up Openings

The Contractor shall block up (off the existing foundation with 215mm blockwork) the existing openings in Room 3 and the existing door openings in Rooms 5, 6, 8, 9, 10 & 11.

Excavate New Wastewater Manholes and Trench

The Contractor shall excavate a new 100m trench with 2no. manholes from new Manhole at South end of yard to the existing 6" wastewater pipe on the Airfield. Location of connection to be confirmed on site. All spoil from trench excavation is to be removed from site.

Existing Stone Surface to Compound Area

Upon completion of the works, the Contractor shall return the surface of the Compound Area to its original surface and condition. The Contractor shall blind with 20mm down stone and roll to a level and even finish to the entire Compound Area.

2. FOUNDATIONS, WALLS & CONCRETE PATH

Note: Drawings T-03 and T-05 to be referred to for all external and internal foundation and wall works.

External Foundations

All external foundations to be constructed as per Section 1-1. Top of Foundation to be 99.100m.

50mm Lean Mix C12/15 (10mm maximum aggregate) concrete blinding.

A393 Mesh at 50mm above bottom of foundation.

900 x 300mm Reinforced Concrete strip foundation as noted.

235mm of T1 bound granular material.

250mm of T2 unbound granular material to be well compacted in layers of 125mm.

Radon Sump laid on T2 unbound granular material.

50mm of T3 sand blinding.

Damp Proof Course membrane and Radon Membrane with all associated tapes and sleeves for rising 4" service pipes.

150mm Concrete Subfloor Screed with A142 Mesh on 50mm chairs on Radon Membrane.

150mm PIR Floor insulation with Under Floor Heating System.

Supply and fit 1no. layer of 500g polythene prior to screed being laid; Supply and fit new CE marked hemihydrate flowing screed/ concrete based flowing screed to an average depth of 65mm.

External Walls

All external walls to be constructed as per Section 1-1 including all necessary DPCs and membranes.

100mm external block work, 150mm full fill cavity insulation and 215mm internal block work.

Supply and fit proprietary single flange cavity closers to all Window Reveals, all External Door Jambs to be returned with blockwork and have 35mm insulation and 150mm vertical DPC fitted.

35mm Vertical Kingspan Rigid Insulation to all external wall perimeters at floor level.

Thermal Block below DPC level. Block is to be installed so to avoid any effect of moisture on thermal conductivity.

Allow for 300mm wide Stainless Steel expanding metal ties at 450mm horizontal and vertical centres to tie to outer leaf as per Manufacturer's instructions.

Finished Floor Level to be 100.00m

Note: Blockwork Expansion Joint to be provided at 12m intervals and to include all necessary slip ties and sleeves as per Manufacturer's instructions, normal wall ties will NOT be accepted.

Smooth Plaster Finish to External Walls

12.5mm scratch coat sand/cement plaster on scudded wall with 12.5mm sand/cement Nap Plaster external SMOOTH finish.

External Level Entry Threshold Detail

All external level entry thresholds to be constructed as per Detail 3-3.

B7 foundation blocks for solid wall construction below DPC level as per Detail 3-3.

Block is to be installed to avoid any effect of moisture on thermal conductivity.

80 x 220mm CompacFoam CF200 or equivalent fixed to concrete step.

ACO Proprietary Drainage Channel with Proprietary flat nonslip perforated stainless steel heel guard grating cover type and suitable for wheelchair access.

Cast In-Situ concrete cill. Maximum slope to be 15 degrees.
Level Wheelchair threshold to have maximum height of 15mm.

Internal Foundations

All internal foundations to be constructed as per Section 2-2. Top of Foundation to be 99.100m.
50mm Lean Mix C12/15 (10mm maximum aggregate) concrete blinding to be laid under all foundations.
600 x 300mm reinforced Concrete strip foundation with 1no. layer of A393 mesh reinforcement laid on chairs 50mm above Lean Mix Concrete Blinding.
235mm of T1 bound granular material.
250mm of T2 unbound granular material to be well compacted in layers of 125mm.
50mm of T3 sand blinding.

Internal Walls

All internal walls to be constructed as per Section 2-2.
Thermal block for solid wall construction below DPC level. Block is to be installed so to avoid any effect of moisture on thermal conductivity.
DPC lapped with Radon Barrier. Rigid insulation to all wall perimeters.
35mm Vertical Kingspan Rigid Insulation to all wall perimeters.
100mm solid block walls with mechanically fixed 12mm plasterboard with 3mm skim finish.
50mm Rockwool Sound Insulation Slab or equivalent installed between block wall and plasterboard.
112mm Insulated Plasterboard mechanically fixed to the existing external wall of Hangar 1 with 3mm skim finish over as per drawing T-04. include for all necessary beads, bonding, fixings, skim etc. to complete the installation.
Finished Floor Level to be 100.00m.

Note: 4no. internal block walls to be built up to roof level as per Drawing T-03 and to include all necessary fireproofing within the attic space.

Finish to Internal Walls in Accessible WCs and WC

The Contractor is to supply and fit new fire rated and certified Vinyl Wall cladding to all walls of the 2no. Accessible WCs and Shower, 1no. Accessible WC and 1no. WC.

Vinyl Wall cladding to be installed from floor to ceiling and welded to the Vinyl flooring at the coved skirting and including all necessary curved internal corners.

Colour to be **Gerflor Mural Ultra Design 8010 Haze Wall Vinyl**.

Pop Up Trapped Outlets

All internal pipework to be constructed as per Detail 4-4.
New 100mm diameter pipework connected to new drainage system as per Drawing T-03.
New 100mm diameter fully trapped Popup/Upstand pipe below FFL.
Allow for all associated fittings, bends, trapes required and surrounding/bedding as noted.
Lap to be a minimum of 150mm. Tape DPC membrane to vertical Popup/Upstand pipe.

External Concrete Path

The Contractor shall construct a 1.8m wide concrete path adjacent to all 3no. external walls.

Concrete path to be constructed as per A4 Detail SK-1014. Precast concrete kerb to all external edges of the concrete path.

The Contractor shall construct a 1.8 x 1.8m level access at the front of each of the 4no. external doors.

Radon Sump

The Contractor shall supply and install 2no. Radon Sumps and associated pipework.

Radon Sump and pipe to be capped in external concrete path.

3. LINTELS

Note: Drawing T-04 to be referred to for Lintel Schedule.

Lintels

L1

Lintel to be 100 x 65 x 1700mm pre-stressed concrete lintel.

9no. L1 lintels required as per Drawing T-04.

L2

Lintel to be 215 x 65 x 1700mm pre-stressed concrete lintel.

8no. L2 lintels required as per Drawing T-04.

L3

Lintel to be 100 x 65 x 1400mm pre-stressed concrete lintel.

22no. L3 lintels required as per Drawing T-04.

L4

Lintel to be 215 x 65 x 1400mm pre-stressed concrete lintel.

4no. L4 lintels required as per Drawing T-04.

L5

Lintel to be 100 x 65 x 1100mm pre-stressed concrete lintel.

2no. L5 lintels required as per Drawing T-04.

L6

Lintel to be 215 x 65 x 1100mm pre-stressed concrete lintel.

2no. L6 lintels required as per Drawing T-04.

L7

Lintel to be 100 x 65 x 2000mm pre-stressed concrete lintel.

1no. L7 lintels required as per Drawing T-04.

4. TIMBER LEAN TO ROOF

Note: Drawings T-05 and T-07 to be referred to for all Timber Lean To Roof works and details.

Timber Notes General

STRUCTURAL TIMBER SHALL COMPLY WITH I.S EN 1995-1-1:2004 (EUROCODE 5: DESIGN OF TIMBER STRUCTURES - GENERAL COMMON RULES AND RULES FOR BUILDINGS) + AC:2006 + A1:2008 + A2:2014, INCLUDING IRISH NATIONAL ANNEX-NA:2010.

TIMBER TRUSSES FOR ROOFS SHALL COMPLY WITH IS EN 1995-1-1:2004 AND S.R 70:2015.

SPECIALIST SUPPLIERS: THE CONTRACTOR SHALL NOMINATE SPECIALIST SUPPLIERS FOR LAMINATED TIMBERS OR TRUSSED RAFTER AS APPLICABLE. THE APPOINTMENT OF THESE SUPPLIERS SHALL BE SUBJECT TO THE ENGINEERS APPROVAL.

TYPE & GRADE OF TIMBER USED:

TRUSSED RAFTERS & GENERAL STRUCTURAL TIMBER SHALL FALL WITHIN GROUP SPECIES SERVICE CLASS 3 IN ACCORDANCE WITH "TIMBER GRADES FOR STRUCTURAL USE" IRRESPECTIVE OF ANY OTHER GRADING CARRIED OUT AT SOURCE.

ALL STRUCTURAL TIMBER SHALL BE MIN. GRADE C16 TO I.S EN 338:2016 (STRUCTURAL TIMBER – STRENGTH CLASSES) (FORMERLY C16 TO I.S 444:1998, NOW WITHDRAWN), UNLESS NOTED OTHERWISE MARKING OF TIMBER & CE MARKING:

THE SPECIES GROUP AND STRESS GRADE SHALL BE MARKED ON ALL TIMBER. ALL TIMBER RE-SAWN FROM STRESS GRADED STOCK SHALL BE REGRADED BEFORE USE.

IN ORDER TO COMPLY WITH THE CONSTRUCTION PRODUCTS REGULATIONS, ALL 'STRUCTURAL TIMBER PRODUCTS/ELEMENTS AND ANCILLARIES' AND 'WOOD BASED PANEL ELEMENTS' MUST ALSO INCORPORATE THE LETTERS CE.

DECLARATION OF PERFORMANCE:

MANUFACTURERS ARE REQUIRED TO PROVIDE A DECLARATION OF PERFORMANCE (DOP) FOR ALL STRUCTURAL TIMBER USED ON THE PROJECT, WHICH CONTAINS TECHNICAL INFORMATION TO DEMONSTRATE THE PRODUCT'S FITNESS FOR PURPOSE.

Insulated Roof Panels

The Contractor shall supply and fit Kingspan Trapezoidal KS1000RW Quadcore Roof Panel or equivalent to entire Lean To Roof area.

Insulated Roof Panels to comprise of the following:

Thickness to be minimum 100mm.

Roof Panel to achieve a minimum U-Value of 0.16W/m²K.

Low Air Leakage of less than 3m³/hr/m².

Continuous 4mm diameter butyl rubber sealant applied to internal panel joint prior to next panel being installed.

Colour: **Agate Grey RAL 7038.**

Treated Roof Battens and Prefabricated Roof Trusses

The Contractor shall supply and fit a new timber Lean To Roof comprising of 150 x 50mm treated roof battens at 900mm centres, prefabricated timber Trusses at 600mm centres and 100 x 35mm timber bracing and rafter diagonal bracing.

Roof Trusses to be designed by a Specialist Truss Manufacturer and design is to include all necessary bracing. Double Trusses around each of 2no. Velux Window and infill loose Trusses on bridging. Specialist Truss Manufacturer to allow for 50mm overhang beyond outer leaf of external wall. Main Contractor to allow for cutting of Top Chord on site to provide for High Line Gutter.

Metal restraint wall ties at maximum 900mm centres at Ceiling and Top Chord level as per Rafter Ceiling Tie Detail on Drawing T-07. RSA under heel of roof to be mechanically fixed to existing Hangar wall at maximum 900mm centres with minimum 16mm x 160mm through bolts 8.8mm or 16mm threaded bar chemically fixed with associated lock nuts and washers.

100 x 75mm Grade C16 timber Wall Plate as shown in drawing and fixed to wall with 30 x 2.5 x 5 x 500mm long Grade 314 Stainless Steel L shaped straps at 900mm centres.

Pressed Metal Flashing

All existing Code 6 Lead Flashing is to be removed and replaced with Pressed Metal Flashing. Colour of Pressed Metal Flashing to match Insulated Roof Panel colour of **Agate Grey RAL 7038**.

New GRP Sheeting

All existing GRP fibreglass sheeting up to the eaves of Hangar 1 is to be removed as per Drawings T-05. New GRP fibreglass sheeting to be fixed to existing steel frame. Colour to be **Clear/Transparent**.

Roof Insulation

The Contractor shall supply and lay 2no. layers of 150mm Loftwool Insulation or equivalent.

1no. 150mm later to be laid between rafters. 1no. 150mm layer to be laid perpendicularly across the top of the rafters.

Velux Windows

The Contractor shall supply 2no. specialised Velux MK08 Low Pitch Windows or equivalent as per Drawing T-04 and include all necessary flashings and fixings allowing the windows to be fitted to the profile of the roof sheeting. Size: 780 x 140mm. Colour: **Slate Grey RAL 7015**.

High Line Gutter and Downpipes

The Contractor shall supply and fit a new High Line Gutter to the entire length of Lean To Roof. Gutter to be fitted directly to the underside of the insulated roof panel. See High Line Gutter Detail on Drawing T-08. Colour of High Line Gutter to match colour of Insulated Roof Panel colour of **Agate Grey RAL 7038**.

The Contractor shall supply and fit 3no. rainwater downpipes to the High Line Gutter as shown in A4Details Drawing SK-10370. Colour of downpipes to match High Line Gutter.

Vents

As per Detail B on Drawing T-05, the Contractor shall install 50mm diameter vents with fly mesh and cap at 900mm centres.

5. CEILINGS

The Contractor shall supply and fit a 62.5mm thick insulated plasterboard to the ceiling areas in all Hallways, Offices, Kitchenettes, Ablutions and Plant Rooms.

Insulated Plasterboard to be mounted directly to the underside of the trusses with mushroom washer heads to screws.

Include for all necessary beads, fixings and fixings, skim and tapes needed to complete the installation

NOTE: Single coat skim or taping and jointing will NOT be accepted, only 2no. coat skim finish to all surfaces will be accepted.

The Contractor shall install 5.no fire rated 550 x 700mm Attic Hatches as shown on Drawing T-04.

6. PVC WINDOWS

The Contractor shall supply and fit double glazed PVC windows as shown on Drawing T-04.

All windows to be Colour **Anthracite Grey RAL 7016**.

All windows openings and windows are to be constructed and installed as per Window Head, Window Reveal and Window Cill details on Drawing T-08.

Window Schedule

<u>Window Number</u>	<u>Location</u>	<u>Glazing</u>	<u>Window Size</u>
1	Office No.1	Double	1200 x 1050mm
2	Office No.1	Double	1200 x 1050mm
3	Office No.2	Double	900 x 1050mm
4	Office No.2	Double	900 x 1050mm
5	Office No.3	Double	1200 x 1050mm
6	Office No.4	Double	900 x 1050mm
7	Office No.4	Double	900 x 1050mm
8	Kitchenette	Double	1200 x 1050mm
9	Accessible WC	Double	600 x 1050mm
10	WC	Double	600 x 1050mm
11	Kitchenette	Double	1200 x 1050mm
12	Engineer Office	Double	1200 x 1050mm
13	Engineer Office	Double	1200 x 1050mm
14	Engineer Office	Double	1200 x 1050mm

7. FLOORS

The Contractor will allow for all necessary Damp Proof Membrane and floor levelling needed to complete the installation of the new floor coverings and all necessary build ups and filling that is required to fit the new coved skirting's throughout

NOTE: The Client will NOT accept any additional works requests in relation to the floors and floor coverings.

Floors to Hallways, Offices, Plant Room, WC Lobby and Kitchenettes

The Contractor shall supply and fit new Flooring **Code 0124 Tortora** to all Hallways, Offices, Kitchenettes, Plant Rooms and WC Lobby with all coved skirtings and cappings as required.

Include for all necessary adhesives, DPMS, levelling compounds and welding needed to complete the installation of the floors.

Floors to Accessible WC and WC

The Contractor shall supply and fit new Vinyl flooring with code **7386 Savana with an R10 slip rating** to the Accessible WC and WC Toilet areas all with coved skirtings and cappings as required.

Include for all necessary welding, filling, adhesives, trims, saddles, reducers and metal angle trims to hot press doors required to complete the floor installations.

Floors to Accessible WC Male and Female Shower Rooms

The Contractor shall supply and fit new Vinyl floor covering R11 to the entire floor area in both the Accessible WC Male and Female Shower rooms: Code **Gerflor Tarasafe H2o 7746 with an R11 slip rating**.

Vinyl Flooring Code No 7746

- Sheet shall be minimum 2.5mm thick and complete with all necessary adhesives, jointing, dressing around features, etc.
- Proprietary aluminium nosing's and trims at change in surface finishes/joints at doors etc.
- Vinyl Floor covering to be laid strictly in accordance with manufacturer's instructions to floor surface.
- Make up any discrepancies in level of floors.
- Vinyl covering to meet requirements of EN 548.
- Fire resistance in accordance with DIN 4102-1 Class B1.

The Contractor shall supply and fit coved vinyl skirting throughout the entire ablution areas.

Skirting to be fitted with top cap to all walls not being fitted with wall cladding and including for all necessary welding and adhesives required to complete the floor installations.

8. DOORS – INTERNAL AND EXTERNAL

External Doors

The Contractor shall supply and fit 4no. single half glass half panel aluminium External Doors as outlined in Drawing T-04.

All External Doors to have a minimum clear width of 825mm and a structural opening of 1000mm.

External Doors to be Munster Joinery Aluminium Ecotherm+ No.20 Malden Panel or equivalent.

External door glass to be double glazed with a U-Value of 1.5W/m²K. Colour to be **DARK GREY**.

External Door Schedule

<u>External Door Number</u>	<u>Location</u>	<u>Fire Door Rating</u>	<u>Door Size</u>
1	North Elevation	FD30	2100 x 900 x 45mm
2	East Elevation	FD30	2100 x 900 x 45mm
3	East Elevation	FD30	2100 x 900 x 45mm
4	Soth Elevation	FD30	2100 x 900 x 45mm

Internal Doors

The Contractor shall supply and fit 13no. FD30S internal door sets and 3no. FD60S Door internal sets to hallways under walls which are built to underside of roof cladding as shown on Drawing T-04.

All Internal Doors (except for FD60 Plant Room Doors) are to have a minimum clear width of 825mm and a structural opening of 1000mm.

Doors shall be a minimum thickness of 44mm and frames shall be a maximum thickness of 70mm.

Threshold gap under or around any door not exceeding 3mm at any point, failure to comply with this will mean the contractor has to address the issue at their own cost.

Doors to be solid cored, flush panelled, sheeted with plywood minimum 6mm thick and faced both sides with 3mm thick oak veneer, minimum 10mm thick solid oak slips all round finished in a clear lacquer.

Doorframes to be Hardwood painted, suitable for use as a FD30 and FD60 frame, frame thickness to be minimum 100mm wide rebated ready to receive liner as required; To be fixed with galvanised concrete screws, minimum 3 per jamb, countersunk and pelleted ready to receive painted finish;

Note : Softwood frames will not be accepted, frames to be supplied in hardwood for harder wearing and longevity.

Bed all frames in intumescent mastic and between the wall and door frame top and sides on the inside and outside of each door; Where the gaps are wider than 10mm use a recognised fire stop penetration seal from the likes of Rockwool.

Each door set to be individually tagged by a registered fire stopping company with all associated paperwork and certs being furnished to the ER on completion of project.

All frames to be checked by ER prior to being covered up with architraves to ensure the fire stopping works have been satisfactorily completed.

All fire doors to be fitted with Dormakaba TS 92 anti-tamper door closers or similar and approved; Standard type door closers will not be accepted.

Fire doors to receive all necessary ironmongery including locks, handles, push plates, kick plates, door closers and door stops fitted to floor; Locks to doors to be FD30/60 euro profile sash locks with associated certified cylinders which are thumb turn to internal of rooms and master key enabled; All ironmongery to achieve 30/60min minimum fire rating and to have all associated certs; all hinges to have intumescent hinge pads fitted with a minimum of 3 no per door; Handles to be certified lever-push-on rose with 1 no pair of euro profile escutcheons stainless steel, colour of hinges to match; All locks to be either Union OR Eurospec OR equivalent, cheaper versions will NOT be accepted; All ironmongery to be approved by the ER prior to being fitted to the doors.

18mm moisture proof liners to be fitted to any door which is wider than the fire frame, rebated into the new frame; Biscuit jointing will not be accepted.

Supply and fit of new 90mm bevelled and primed MDF architraves to both sides of the new frames; Existing skirting's to be cut and adjusted to leave a neat flush joint where they meet the new architraves on both sides of doors.

Supply and fit of good quality Aluminium Nameplate holders screwed to door face as required.

Supply and fit of good quality Aluminium Room Number tags, background to be Aluminium colour with black writing, screwed to door face as required.

Doors to have Fire Door Keep Shut aluminium signs as required.

Supply and fit of new timber saddle to cover the area which has been left once the original saddle has been removed.

Internal Door Schedule

<u>Internal Door Number</u>	<u>Location</u>	<u>Fire Door Rating</u>	<u>Door Size</u>
1	Office No.1	FD30	2032 x 864 x 44mm
2	Office No.2	FD30	2032 x 864 x 44mm
3	BFW Hallway	FD30	2032 x 864 x 44mm
4	Office No.3	FD30	2032 x 864 x 44mm
5	Office No.4	FD30	2032 x 864 x 44mm
6	BFW Hallway	FD30	2032 x 864 x 44mm
7	BFW Kitchenette	FD30	2032 x 864 x 44mm
8	Plant Room (Single Door)	FD60	2032 x 813 x 57mm
9	Plant Room (Double Door)	FD60	2no. 2032 x 813 x 57mm
10	Acc. Male WC Shower	FD30	2032 x 864 x 44mm
11	Acc. Female WC Shower	FD30	2032 x 864 x 44mm
12	Lobby WC	FD30	2032 x 864 x 44mm
13	Accessible WC	FD30	2032 x 864 x 44mm
14	WC	FD30	2032 x 864 x 44mm
15	Engineer Kitchenette	FD30	2032 x 864 x 44mm
16	Engineer Hallway	FD30	2032 x 864 x 44mm

Fire Certification and Marking

The Contractor shall, immediately prior to Substantial Completion, certify that the construction work carried out on the contract by him and his workers has been carried out in such a way as to ensure that the integrity of the fire zones within the building has been maintained. That all fire barriers, control elements, coatings and alarm systems have been provided and installed in compliance with the relevant Standards.

All fire-resistant coatings such as intumescent paints shall be clearly identified with an engraved plate identifying the designed fire rating and specifying that no paint or other decorative coatings shall be applied to the coating without the prior agreement of the person with maintenance responsibility for the building. The locations for the plates shall be instructed by the ER.

All fire rated door-sets with non-metallic leaves shall be permanently identified in accordance with the requirements of BS 8214:1990 identifying the period of fire resistance, the manufacturer's name and address, the year of manufacture and other pertinent details.

These details shall be engraved on a metal plate, fire resistant to 800°C, which shall be fixed to the hinge stile of the door leaf near the top edge and shall be clearly legible. Every fire door (i.e. the complete fire door assembly) shall be supported by a fire test report from an accredited laboratory (see Technical Guidance Document D of the Building Regulations) that indicates that the complete assembly will meet the required performance

Painting of Internal Doors

The Contractor shall sand down timber fire door sets including frames, liners and architraves ready to receive new paint finishes.

New timber architraves, liners and doorframes to be receive 2no. undercoats and 2no. finish coats of satinwood; Color to be White; New fire doors to be prefinished Oak with lacquer finish.

Intumescent strips to be fitted AFTER all painting of frames has been completed; Intumescent strips that have paint on them will be required to be replaced as this could have an impact on the performance of same.

9. KITCHENETTES

The Contractor shall supply and fit 2no. new kitchenettes and countertops with sinks in the BFW Kitchenette and the Engineer Kitchenette.

BFW Kitchenette

The Contractor shall supply and fit 1no. new kitchen unit and countertop on 3.3m long wall.

Kitchen unit to include:

- 1no. 600mm set of drawer stack with blum soft close runners.
- Standard single sided drain sink in a 700mm Sink Unit.
- 1no. Quooker Hot Tap or equivalent.
- Base and wall units to make up the remaining space. Exact unit sizes are to be confirmed on site by the ER.
- Doors to be high gloss finish Larissa from Noyeks or equivalent with good quality hinges.
- Colour to be **Alabaster**.
- Worktop to be from the Duropal post formed range, colour to be **Grey**.

The Contractor shall supply and fit all new base and wall units including plinths, fillers, cornice, pelmets and gables required to complete the kitchen installation; colours of all above items to match the kitchen doors.

Engineer Kitchenette

The Contractor shall supply and fit 1no. new kitchen unit and countertop on 2.4m long wall.

Kitchen unit to include:

- 1no. 600mm set of drawer stack with blum soft close runners.
- Standard single sided drain sink in a 700mm Sink Unit.
- 1no. Quooker Hot Tap or equivalent.
- Base and wall units to make up the remaining space. Exact unit sizes are to be confirmed on site by the ER.
- Doors to be high gloss finish Larissa from Noyeks or equivalent with good quality hinges.
- Colour to be **Alabaster**.
- Worktop to be from the Duropal post formed range, colour to be **Grey**.

The Contractor shall supply and fit all new base and wall units including plinths, fillers, cornice, pelmets and gables required to complete the kitchen installation; colours of all above items to match the kitchen doors.

10. SANITARYWARE

All fittings, equipment and furniture to be assembled and fitted to the areas indicated on the drawings in strict accordance with the manufacturer's guidelines.

The Contractor shall supply and fit the following sanitary ware, fittings and furniture:

SANITARY FITTINGS

WC

The Contractor shall supply and fit 1No. Sandringham 21 Back to Wall WC with concealed WC cistern or equivalent as indicated on Drawing T-04. WC to include:

Complete with seat and slow close cover and mechanical dual flush panel.
Finish colour to be WHITE.

Wash Hand Basin

Supply and fit 4no. WHB to positions as indicated on the drawings, including:

Armitage Shanks Sandringham 21 WHB (450 x 300mm) with overflow or equivalent complete with one tap hole including;

Fixing brackets.

Dual control 1 tap hole.

Basin mixer with pop-up waste.

S8910 Trap 1¼" plastic bottle, 75mm seal.

PVC trap and overflow.

Seal between WHB and vinyl wall cover with mould resistant silicone sealant. Colour **WHITE**.

Accessible WCs

The Contractor shall supply and fit 3no. Armitage Shanks Accessible Sandringham 21 WCs or equivalent that comply with TGD Part M. Accessible WCs to include:

Close coupled pan: Vitreous China, white, (455mm high).

Push button cistern.

Toilet seat: plastics, charcoal.

Wall hung WHB : Vitreous China, white (450 x 300mm).

Seal between WHB and vinyl wall cover with mould resistant silicone sealant.

Chrome level action spray mixer tap.

Chrome 32mm flush grated waste.

3no. Vertical Grab Rails (600mm x 35mm): coated steel, white.

1no. Vertical Grab Rails (600mm x 35mm): coated steel, white.

Hinged support rail including toilet roll holder.

Clothes Hooks mounted on wall.

Colour **WHITE**.

Accessible Shower Trays and Shower Screen

Supply and fit 2no. Armitage Shanks Idealite low profile rectangular flat top shower trays in Male and Female Accessible Showers. To Comply with TGD Part M and include:

1500mm x 900mm Shower Tray

Accessible Shower Screen to match shower tray size.

Shower Heads

Supply and fit 2no. PRESTOTEM 2 (88868) Shower Panel with TOUCH and standard Thermostatic Mixer Tap or equivalent as indicated on Drawing T-04.

Shower Heads to include:

6l/min with integrated flow limiter.

Anti-water-hammering device.

Fixed shower head with anti-limescale spikes

Flow time of 30 second and Start/Stop function.

Wall Mirrors

Supply and fit 4no. 765 x 400mm x 6mm polished wall mirrors with chrome plated fixing clips above each of 4no. Wash Hand Basins and centred above each set of taps.

1no. wall mirror to be mechanically fixed to wall above WHB in Male Accessible WC.

1no. wall mirror to be mechanically fixed to wall above WHB in Female Accessible WC.

1no. wall mirror to be mechanically fixed to wall above WHB in Accessible WC.

1no. wall mirror to be mechanically fixed to wall above WHB in WC.

All exposed edges to be smoothed.

Toilet Paper Dispensers

The Contractor is to supply and fit 1no. Toilet Paper Dispenser adjacent to toilet in WC.

Note: Defence Forces to provide Contractor with 1no. Toilet Paper Dispenser.

Hand Towel Paper Dispensers

The Contractor is to supply and fit 4no. Hand Towel Paper Dispensers.

1no. Hand Towel Paper Dispenser to be mechanically fixed to wall in Male Accessible WC.

1no. Hand Towel Paper Dispenser to be mechanically fixed to wall in Female Accessible WC.

1no. Hand Towel Paper Dispenser to be mechanically fixed to wall in Accessible WC.

1no. Hand Towel Paper Dispenser to be mechanically fixed to wall in WC.

Note: Defence Forces to provide Contractor with 4no. Hand Towel Paper Dispensers.

Fire Points

Supply and fit 3no. Fire Points as per Drawing PDE-B14-85-303.

2no. Fire Points in BFW Offices Hallway.

1no. Fire Point in Engineer Office Hallway.

Each Fire Point to include 1no. 2.5kg CO2 and 1no. 6 Litre Fluorine Free Foam extinguisher c/w brackets and wall mounted signage at each location,

(Total 6no. 2.5kg CO2 and 6no. 6 Litre Fluorine Free Foam).

11. WATER SERVICES

Note: Drawing PDE-B14-85-302 to be referred to for all Water Services.

The Contractor shall lay a new 28mm diameter Class C PVC Main Water Service pipe from the Plant Room to the existing 100mm diameter PVC watermain as shown on Drawing PDE-B14-85-302. Approximate distance is 25m. New Stopcock to be installed also.

The Contractor shall reroute the existing Water Service Pipe to South of site and install a new Bib Tap with external hose facility as shown on Drawing PDE-B14-85-302.

The Contractor shall supply and install a new 500 litre combined Water Storage Tank and Pressure Booster Pump in the Plant Room as shown on Drawing PDE-B14-85-302.

The Contractor shall supply and install a new 300 litre Hot Water Cylinder complete with a 6kW Immersion Heater in the Plant Room as shown on Drawing PDE-B14-85-302.

The Contractor shall supply and install a new Water Softener 40000 Grain as shown on Drawing PDE-B14-85-302. Water hardness is to be tested prior to installation to confirm the required Water Softener size/capacity.

The Contractor shall supply and install a new 22mm diameter Mains Water Service, 22mm diameter Cold Water Service, 22mm diameter Boosted Hot Water Service and 15mm diameter Hot Water Service from Plant Rooms to all WHBs and Kitchenettes as shown on Drawing PDE-B14-85-302.

The Contractor shall supply and install a new 15mm diameter Cold Water Service, 15mm diameter Hot Water Service and 15mm diameter Hot Water Return Service to the sink in each of the 2no. Kitchenettes as shown on Drawing PDE-B14-85-302.

The Contractor shall supply and install a new 15mm diameter Cold Water Service and 15mm diameter Hot Water Service to Shower Mixer Valve in each of the 2no. Accessible Showers as shown on Drawing PDE-B14-85-302.

Notes

Shower Mixer Valve to be Rada Meynell V8/3 Thermostatic Mixing Valve or equivalent.

All final branches to appliances/sanitaryware are to be fitted with isolating valves.

All pipework runs that are concealed and in the attic space are to be insulated with Fibreglass Rigid Sections Class 'O' finish.

All exposed pipework is to be Chrome Plated Copper.

All WHBs are to be fitted with Thermostatic Temperature Limiting Valves.

12. WASTEWATER & DRAINAGE

Note: Drawing T-04 to be referred to for all Wastewater Services and Drainage Works.

The Contractor shall supply and lay a new 150mm diameter PVC pipe from BFW Kitchenette to Manhole No.1. Approximate distance is 25m and a fall of 1:125.

The Contractor shall supply and lay a new 150mm diameter PVC pipe from Manhole No.1 to Manhole No.3. Approximate distance is 100m and a fall of 1:125.

The Contractor shall construct 2no. new manholes and connect into existing wastewater line using a 6" PVC manhole base with risers.

The Contractor is to construct 5no. Inlet Gullies and 6no. Access Junctions (AJ1, 2, 3, 4, 5 & 6).

All wastewater from kitchenette sinks and WHBs are to pass through Inlet Gullies before entering Access Junctions.

All pipework below ground level to be standard **orange** PVC piping; all pipework above ground level both inside and outside of the building is to be **black** including all fixtures and fittings.

The Contractor shall supply and fit all new waste pipework throughout and connect to new external 150mm diameter PVC pipe.

The Contractor is to ensure that all sinks and showers are connected directly into the 4" wastewater pipes internally and are laid to the correct falls running to the external walls of building where they will be connected to a back inlet gully prior to connection to an AJ.

Sink and shower wastes drilled out through external walls and bossed into 4" soil stack pipework via strap on boss or glued push in boss.

The Contractor is to ensure that all new toilet waste pipes are drilled directly out through the external walls and connected to a 90-degree bend with a rodding eye.

All pipework runs are to be horizontal and laid to correct falls and in turn connected to a new vertical Soil Vent Pipe which is to extend up and over the level of the gutter. Soil Vent Pipe is to be fitted with a bird guard.

The Soil Vent Pipe is to be connected to the mains sewer via a new PVC manhole; include for all necessary fixtures, fittings and bends required to complete the soil stacks.

Construction of 3no. soakaways for rainwater and surface water. Soakaways to be constructed as per BRE Digest 365.

13. ELECTRICAL

Note: Drawings PDE-B14-85-304, PDE-B14-85-401, PDE-B14-85-402, PDE-B14-85-403 & PDE-B14-85-404 to be referred to for all Electrical Services.

New Feeder Pillars FP1 and FP2

The Contractor shall replace the existing Feeder Pillar at FP1 and install a new Feeder Pillar at FP1. The Contractor shall remake all existing cable connections as shown in Drawing PDE-B14-85-304. See New Feeder Pillar FP1 Schematic for details.

The Contractor shall supply and install a new Feeder Pillar at FP2 as shown in Drawing PDE-B14-85-304. See New Feeder Pillar FP2 Schematic for details.

New Feeder Pillars to comprise of the following:

- Stainless Steel Enclosure to IP67.
- Fully prewired.
- Full Neutral and Earth.
- Light c/w Emergency Pack.
- Heater.
- 1no. 2-Gang 13A Socket.
- Removable Flash Guard (To be removable with power-on at Pillar).
- Rodent Proof Enclosure with Steel Floor Plate.
- Key lockable Door.
- Provision of space for 25% additional Future Capacity.

New Cu/SWA/XLPE Cable

The Contractor shall supply and install a new 5x70mm² Cu/SWA/XLPE cable from New Feeder Pillar at FP1 to New Feeder Pillar 2 at FP2 through the existing and new ducts as shown in Drawing PDE-B14-85-304. Approximate length of cable required is 150m.

New Communications Patch Panel

The Contractor shall supply and install a new Communications Patch Panel in Office No.1 as shown in Drawing PDE-B14-85-304.

New LV Ducts

The Contractor shall supply and install new LV Ducts and routed from an existing Access Chamber (LV) as per Drawing PDE-B14-85-304. Duct to be 125mm diameter and approximate length of 35m.

New Communications/ELV Ducts

The Contractor shall supply and install new Communications/ELV Ducts and routed from an existing Access Chamber (Comms/ELV) as per Drawing PDE-B14-85-304. Duct to be 125mm diameter and approximate length of 60m.

New Access Chambers

The Contractor shall supply and install 2no. new Access Chambers for new Communications/ELV cables as per Drawing PDE-B14-85-304 and Access Chamber Detail on Drawing PDE-B14-85-404.

New Main Distribution Board

The Contractor shall supply and install 1no. new Main Distribution Board in the Plant Room as outlined in the Schematic in Drawing PDE-B14-85-401.

New Motor Control Centre (MCC)

The Contractor shall supply and install 1no. new Motor Control Centre (BMS Controls) in the Plant Room as outlined in Drawing PDE-B14-85-401.

The Contractor shall supply and install 1no. new Motor Underfloor Heating Manifold in the Plant Room as outlined in Drawing PDE-B14-85-401.

New Fire Alarm Panel

The Contractor shall supply and install 1no. new Fire Alarm Panel in the BFW Hallway as outlined in Drawing PDE-B14-85-401. Fire Alarm Panel to be interlocked with MCC panel.

The Contractor shall supply and install 1no. new pulsed Water Meter in the Plant Room as outlined in Drawing PDE-B14-85-401.

BFW Office No.1

The Contractor shall supply and install 1no. 13A Twin Socket Outlet Switched, 1no. Space Temperature Sensor, 4no. Twin RJ45 Voice/Data Outlet wired back to Patch Panel, 5no. 13A Twin Socket Outlet Switched (mounted at 800mm above FFL) and 1no. new Patch Panel as outlined in Drawing PDE-B14-85-401.

BFW Office No.2

The Contractor shall supply and install 1no. 13A Twin Socket Outlet Switched, 1no. Space Temperature Sensor, 4no. Twin RJ45 Voice/Data Outlet wired back to Patch Panel and 4no. 13A Twin Socket Outlet Switched (mounted at 800mm above FFL) as outlined in Drawing PDE-B14-85-401.

BFW Office No.3

The Contractor shall supply and install 1no. 13A Twin Socket Outlet Switched, 1no. Space Temperature Sensor, 4no. Twin RJ45 Voice/Data Outlet wired back to Patch Panel and 4no. 13A Twin Socket Outlet Switched (mounted at 800mm above FFL) as outlined in Drawing PDE-B14-85-401.

BFW Office No.4

The Contractor shall supply and install 1no. 13A Twin Socket Outlet Switched, 1no. Space Temperature Sensor, 4no. Twin RJ45 Voice/Data Outlet wired back to Patch Panel and 4no. 13A Twin Socket Outlet Switched (mounted at 800mm above FFL) as outlined in Drawing PDE-B14-85-401.

BFW Kitchenette

The Contractor shall supply and install 1no. 13A Twin Socket Outlet Switched, 2no. 13A Twin Socket Outlet Switched (mounted at 800mm above FFL) and 1no. Extract Fan with Local Switch (EF5) as outlined in Drawing PDE-B14-85-401.

BFW Hallway

The Contractor shall supply and install 3no. 13A Twin Socket Outlet Switched and 2no. Space Temperature Sensors as outlined in Drawing PDE-B14-85-401.

BFW Male Accessible WC

The Contractor shall supply and install 1no. Chrome Hand Drier (World Airforce or equivalent) and 1no. Extract Fan (EF1) complete with Activity Sensor and a 15minute Overrun Timer as outlined in Drawing PDE-B14-85-401.

The Contractor shall supply and install 2no. Accessible WC Sounder/Lamp/PSU Pullcord as outlined in Drawing PDE-B14-85-401.

BFW Female Accessible WC

The Contractor shall supply and install 1no. Chrome Hand Drier (World Airforce or equivalent) and 1no. Extract Fan (EF2) complete with Activity Sensor and a 15minute Overrun Timer as outlined in Drawing PDE-B14-85-401.

For EF2, 125mm diameter duct to be installed a high level in bulkhead to external wall terminal.

The Contractor shall supply and install 2no. Accessible WC Sounder/Lamp/PSU Pullcord as outlined in Drawing PDE-B14-85-401.

Engineer Accessible WC

The Contractor shall supply and install 1no. Chrome Hand Drier (World Airforce or equivalent) and 1no. Extract Fan (EF3) complete with Activity Sensor and a 15minute Overrun Timer as outlined in Drawing PDE-B14-85-401.

Engineer WC

The Contractor shall supply and install 1no. Chrome Hand Drier (World Airforce or equivalent) and 1no. Extract Fan (EF4) complete with Activity Sensor and a 15minute Overrun Timer as outlined in Drawing PDE-B14-85-401.

Engineer WC Lobby and Hallway

The Contractor shall supply and install 2no. 13A Twin Socket Outlet Switched as outlined in Drawing PDE-B14-85-401.

Engineer Kitchenette

The Contractor shall supply and install 2no. 13A Twin Socket Outlet Switched, 1no.13A Twin Socket Outlet Switched (mounted at 800mm above FFL) and 1no. Extract Fan with Local Switch (EF6) as outlined in Drawing PDE-B14-85-401.

Engineer Office

The Contractor shall supply and install 1no. Space Temperature Sensor, 8no. Twin RJ45 Voice/Data Outlet wired back to Patch Panel and 8no. 13A Twin Socket Outlet Switched (mounted at 800mm above FFL) as outlined in Drawing PDE-B14-85-401.

Notes

All final locations of Power and Data Outlets are to be confirmed on site with the Employer's Representative prior to 1st Fix Installation.

A maximum of 6no. Power Sockets to be wired per circuit.

All Electrical Work to conform with current National Rules for Electrical Installations I.S. 10101:2020.

External Lighting

The Contractor shall supply and install 5no. Luminaires Type 8 (Flood Type), 100W LED Floodlight Pole/Bracket mounted with Photo-Cell and Timeclock Control Timer as outlined in Drawing PDE-B14-85-402. Luminaires to be mounted at 5m.

External Entry/Exits

The Contractor shall supply and install 4no. Luminaire Type 7 IP65 Emergency Luminaire as NVC Nebraska Lithium 2W 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Emergency Exit Luminaires

The Contractor shall supply and install 8no. Luminaire Type 5 Emergency Exit Sign Ansell Watchman 3w NM LED or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Office No.1

The Contractor shall supply and install 2no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Office No.2

The Contractor shall supply and install 2no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Office No.3

The Contractor shall supply and install 2no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Office No.4

The Contractor shall supply and install 2no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Kitchenette

The Contractor shall supply and install 1no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Hallway

The Contractor shall supply and install 9no. Luminaire Type 2 Rexel 15W LED 2DW LED or equivalent, 4no. PIR Lighting Presence Detector and 4no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Plant Room

The Contractor shall supply and install 2no. Luminaire Type 2 Rexel 15W LED 2DW LED or equivalent and 2no. Switches mounted at 1350mm above FFL as outlined in Drawing PDE-B14-85-402.

BFW Male Accessible WC

The Contractor shall supply and install 1no. Luminaire Type 4 Disano 1844 Globo 2.0 14w LED IP65 or equivalent, 1no. Switch mounted at 1350mm above FFL, 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent and 1no. Luminaire Type 3 (Over-Mirror Type- Switched) DIVA 8W LED Dual Voltage Shaver Light or equivalent as outlined in Drawing PDE-B14-85-402.

BFW Female Accessible WC

The Contractor shall supply and install 1no. Luminaire Type 4 Disano 1844 Globo 2.0 14w LED IP65 or equivalent, 1no. Switch mounted at 1350mm above FFL, 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent and 1no. Luminaire Type 3 (Over-Mirror

Type- Switched) DIVA 8W LED Dual Voltage Shaver Light or equivalent as outlined in Drawing PDE-B14-85-402.

Engineer Accessible WC

The Contractor shall supply and install 1no. Luminaire Type 2 Rexel 15W LED 2DW LED or equivalent, 1no. 1no. Switch mounted at 1350mm above FFL and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Engineer WC

The Contractor shall supply and install 1no. Luminaire Type 2 Rexel 15W LED 2DW LED or equivalent, 1no. 1no. Switch mounted at 1350mm above FFL and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Engineer WC Lobby and Hallway

The Contractor shall supply and install 3no. Luminaire Type 2 Rexel 15W LED 2DW LED or equivalent, 2no. PIR Lighting Presence Detector and 2no. . Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Engineer Kitchenette

The Contractor shall supply and install 1no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Engineer Office

The Contractor shall supply and install 4no. Luminaire Type 1 Prelux Campus 58W LED or equivalent, 1no. PIR Lighting Presence Detector and 1no. Luminaire Type 6 Emergency Luminaire Ansell Falcon 3W surface LED 3NM or equivalent as outlined in Drawing PDE-B14-85-402.

Attic Void

The Contractor shall supply and install 5no. Luminaire Type 9 corrosion proof NVC Cleveland Single LED 35W IP65 in the Attic Void and switched at each Access Hatch as outlined in Drawing PDE-B14-85-402.

Notes

A sample of each type of light fitting is to be provided to the Employer's representative prior to Contractor placing the order for light fittings.

Final locations of light fittings are to be confirmed on site with the Employer's Representative.

All Emergency Lighting is to be supplied, installed and commissioned to Irish Standard I.S. 3217.

All Emergency Lighting shall comprise of self-contained standalone fittings with 3-hour battery and inverter.

PIR Motion Sensors are to be adjustable for time duration and outside ambient lighting levels

Fire Alarm and Detection System

External

The Contractor shall supply and install 1no. External Combined Sounder with Flashing Beacon on the East External Wall as outlined in Drawing PDE-B14-85-403.

BFW Office No.1

The Contractor shall supply and install 1no. Optical Smoke Detector on the ceiling of Office No.1 as outlined in Drawing PDE-B14-85-403.

BFW Office No.2

The Contractor shall supply and install 1no. Optical Smoke Detector on the ceiling of Office No.2 as outlined in Drawing PDE-B14-85-403.

BFW Office No.3

The Contractor shall supply and install 1no. Optical Smoke Detector on the ceiling of Office No.3 as outlined in Drawing PDE-B14-85-403.

BFW Office No.4

The Contractor shall supply and install 1no. Optical Smoke Detector on the ceiling of Office No.4 as outlined in Drawing PDE-B14-85-403.

BFW Kitchenette

The Contractor shall supply and install 1no. Heat Detector on the ceiling of the Kitchenette as outlined in Drawing PDE-B14-85-403.

BFW Plant Rooms

The Contractor shall supply and install 2no. Optical Smoke Detectors on the ceilings of the Plant Rooms as outlined in Drawing PDE-B14-85-403.

BFW Hallway

The Contractor shall supply and install 3no. Combined Smoke Detector and Sounder on the ceiling of the hallway as outlined in Drawing PDE-B14-85-403.

The Contractor shall supply and install 3no. Optical Smoke Detector c/w Remote Indication in the Ceiling Void as outlined in Drawing PDE-B14-85-403.

The Contractor shall supply and install 1no. new Main Distribution Board and 1no. new Fire Alarm Panel c/w GSM Dial-Out facility in the Hallway as outlined in Drawing PDE-B14-85-403.

The Contractor shall supply and install 2no. BGU Call Points on the internal wall at each External Exit Door as outlined in Drawing PDE-B14-85-403.

BFW Male and Female Accessible WCs

The Contractor shall supply and install 1no. Internal Combined Sounder with Flashing Beacon in the Male Accessible WC and 1no. Internal Combined Sounder with Flashing Beacon in the Female Accessible WC as outlined in Drawing PDE-B14-85-403.

Engineer Accessible WC, WC & Lobby

The Contractor shall supply and install 1no. Optical Smoke Detector in the Accessible WC and 1no. Optical Smoke Detector in the WC as outlined in Drawing PDE-B14-85-403.

The Contractor shall supply and install 1no. Optical Smoke Detector c/w Remote Indication in the Ceiling Void as outlined in Drawing PDE-B14-85-403.

The Contractor shall supply and install 1no. Combined Smoke Detector and Sounder on the ceiling of the lobby as outlined in Drawing PDE-B14-85-403.

Engineer Hallway

The Contractor shall supply and install 1no. Combined Smoke Detector and Sounder on the ceiling of the hallway and 1no. BGU Call Point on the internal wall at the External Exit Door as outlined in Drawing PDE-B14-85-403.

Engineer Kitchenette

The Contractor shall supply and install 1no. Heat Detector on the ceiling of the Kitchenette as outlined in Drawing PDE-B14-85-403.

Engineer Office

The Contractor shall supply and install 1no. Optical Smoke Detector on the ceiling of Engineer Office and 1no. Optical Smoke Detector c/w Remote Indication in the Ceiling Void as outlined in Drawing PDE-B14-85-403.

Notes

The Fire Alarm System to be supplied, installed and commissioned to Irish Standards IS:3218L1-M with Automatic Detection in all areas and voids.

Fire Alarm System to be an Addressable System and Fire Detection to be included in all Roof Voids.

Sounders are to be incorporated into the Detectors and wired on Detector Loops.

Detectors in the Roof Voids are to be fitted with Remote Indicators and mounted outside the void.

Roof Void light switches to be provided at the Access Hatch and switch is to be fitted with a neon indicator.

3 Compartment DADO Trunking

The Contractor shall supply and install new 3 Compartment DADO Trunking mounted on the Internal Walls in BFW Office No.1, BFW Office No.2, BFW Office No.3, BFW Office No.4 and Engineer Office as per Drawing PDE-B14-84-404. Approximate length of DADO trunking is 52m.

75mm Sub Main Cable Tray

The Contractor shall supply and install new 75mm Sub Main Cable Tray from the MDB to MCC as per Drawing PDE-B14-84-404. Approximate length is 6m.

75mm x 70mm Trunking Run

The Contractor shall supply and install new 75mm x 70mm Trunking Run in the attic space as per Drawing PDE-B14-84-404. Approximate length is 45m.

100mm ELV Cable Tray Run

The Contractor shall supply and install new 100mm ELV Cable Tray Run in the attic space as per Drawing PDE-B14-84-404. Approximate length is 40m.

Notes

Mains SWA Cable to be carried on Galvanised Steel Main Cable Tray above ceilings and vertically on risers.

Communications/ELV Cables to be carried on Galvanised Steel Main Cable Tray above ceilings and vertically on risers.

Power and Lighting PVC cables to be carried in Galvanised Steel Trunking with drops in Galvanised Steel Conduit.

Intumescent Fire Barrier to be installed in all Trunking passing through each Fire Compartment.

14. MECHANICAL

Note: Drawings PDE-B14-85-301, PDE-B14-85-302, PDE-B14-85-303 & PDE-B14-85-304 to be referred to for all Mechanical Services.

Underfloor Heating and Water Heating System

The Contractor shall include for the supply, installation and commissioning of the Underfloor Heating System in the areas as indicated on PDE-B14-85-301.

The Contractor shall supply and fit a new 16kW Air to Water Heat Pump Panasonic WH-MXC16J9E8 or equivalent, a 300 litre Hot Water Cylinder complete with 1no. 6kW Immersion Heater energised via Timeclock and a 100 litre Buffer Tank with all associated pipework, circulating pumps, isolating valves, temperature control sensors and thermostats as indicated on PDE-B14-85-301.

The Contractor shall supply and fit 40mm diameter heating flow and return pipe runs in the attic space as indicated on PDE-B14-85-301. Approximate length of pipe run is 30m.

The Contractor shall supply and fit a new 500 litre combined Water Storage Tank and Pressure Booster Pump, Powerbox or equivalent. Water Storage Tank to be ground mounted and 700mm diameter.

The Contractor shall engage with a Specialist Supplier to supply and lay an Underfloor Heating System and Pipework Arrangement as indicatively shown on PDE-B14-85-301.

The underfloor heating pipe shall be Polytherm underfloor heating pipe 16mm x 2mm or equivalent. Pipe to be made of high-density crosslinked polyethylene pipe to DIN 16892/3, BS EN 1264-4:2009 with EVOH oxygen diffusions barrier to DIN standard 4726/9.

The Specialist Supplier shall provide a detailed Heating Scheme Design to include all pipework and equipment. All Proposed Scheme drawings, details, equipment and design data are to be submitted to the Employer's Representative prior to installation.

BMS Patch Panel

The Contractor shall supply and install a new BMS Patch Panel 12U in the BFW Office No.1 as shown on PDE-B14-85-301.

The Contractor shall supply and install a new MCC Control Panel in Plant Room and complete with TREND BMS Controller and Facia Mounted IQ4 View Control Pad as indicated on PDE-B14-85-301.

The Contractor shall supply and install 7no. new Temperature Control Sensors. 1no. in BFW Office No.1, BFW Office No.2, BFW Office No.3, BFW Office No.4, Engineer Office and 2no. in BFW Hallway as indicated on PDE-B14-85-301.

Notes

Air to Water Heat Pump is to be mounted on a Concrete Plinth Base and include for a condensate pipe to a drain.

Heating Pipework to be Steel with crewed Fitting. All Pipework to be sleeved where passing through openings. Pipe Brackets Type 238R to be used throughout.

Pipework to be supported at 2m intervals max. Supports to be fabricated from Unistrut sections with pipe rollers as required. Pipework to be identified using self-adhesive bands at regular intervals.

Pipework system to be pressure Tested before connection to emitters. 7 Bar for 24 Hours.

All Pipework to be primed and painted. External Pipework to have 2No. Coats of Red Oxide Primer before Insulation installed.

All Pipework to be insulated with Rigid fibreglass Sections Class 'O'.

15. PAINTING & DECORATING

Internal Painting

Offices and Kitchenettes

All new plastered wall surfaces in the 5no. Offices and 2no. Kitchenettes are to be painted with 3 no. coats of **PERMA WHITE** mould resistant paint by **ZINSSER** and tinted to the colour of **Batch Loaf by Colourtrend**.

Hallways, Plant Rooms and WC Lobby

All walls in all Hallways, Plant Rooms and WC Lobby are to be painted with 3 no. coats of **Premium End washable Matt Emulsion paint** (Crown Clean Extreme or Dulux Diamond Coat). Colour to be tinted to **Batch Loaf by Colourtrend**.

Ceilings

All ceilings in each Office, Hallway, Lobby, Shower/WC and WC are to be painted with 3no. coats of **Premium Brilliant White Ceiling Paint**. 2no. Velux Widow openings are to be included.

External Painting

External Walls

Apply 3no. coats of good quality Exterior Emulsion paint to all external wall surfaces. Colour to be **LIGHT GREY**.

All exterior windowsills and plinths to receive a darker Exterior Emulsion paint. Colour to be **DARK GREY**.

.

16. TESTING & COMMISSIONING

The Contractor is to ensure the testing, commissioning and certification of all electrical work carried out.

The Contractor is to ensure the testing, commissioning and certification of all mechanical works carried out.

The Contractor is to provide Fireproof Certification for all penetrations of walls and ceilings that were required for electrical and mechanical services.

The Contractor is to ensure the testing, commissioning and certification of the Fire Detection Alarm System and all Emergency Lighting.

The Contractor is to ensure that the testing of all new wastewater pipes prior to handover and to confirm no mixing of toilet and sink /shower wastewater occurs in same pipe prior to entering the manhole.

17. CLEANING & HANDOVER

The Contractor is to ensure that all Offices, Kitchenettes and WCs are thoroughly cleaned before hand over.

The Contractor is to ensure that all hallways and lobbies are thoroughly cleaned before hand over.

The Contractor is to ensure that all areas where the contactors compound was located are cleared of all materials and waste.

APPENDIX A

CIVIL & STRUCTURAL DRAWING SCHEDULE

DRAWING NUMBER	DRAWING CONTENT
T-01	Existing Plan Survey
T-02	Demolition Plan
T-03	Foundation Plan
T-04	Ground Floor Plan
T-05	Section B-B
T-06	Elevations
T-07	Roof Plan
T-08	Details
A4 Details	A4 Details

MECHANICAL DRAWING SCHEDULE

DRAWING NUMBER	DRAWING CONTENT
PDE-B14-85-301	Heating Services Layout
PDE-B14-85-302	Water Services Layout
PDE-B14-85-303	Fire Fighting Layout
PDE-B14-85-304	Site Services Layout

ELECTRICAL DRAWING SCHEDULE

DRAWING NUMBER	DRAWING CONTENT
PDE-B14-85-401	Electrical General Services Layout
PDE-B14-85-402	Electrical Lighting Layout
PDE-B14-85-403	Fire Alarm Layout
PDE-B14-85-404	Electrical Trunking Layout

APPENDIX B

TYPICAL INFORMATION REQUIRED

TO BE HANDED OVER TO THE EMPLOYER'S REPRESENTATIVE

ON COMPLETION OF THE PROJECT AND TO BE MADE AVAILABLE TO THE PSDP TO ALLOW

COMPILATION OF THE SAFETY FILE

- a. Identification of and locations of all potentially hazardous materials (eg certain insulation materials, two pack and other special paint coatings) and installations and the procedures to be followed in order to minimise the associated risks:
 - i) in the daily use of the building or structure
 - ii) when maintenance, repair, refurbishment or replacement of the materials or installations is to be undertaken.
- b. Marked up construction drawings showing how the work was built where it differs from the requirements shown on the drawings issued to the Contractor. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.
- c. Specifications and details of pipe and cable run layouts and fixed systems. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.
- d. Details of fixed equipment and systems including charts and manuals specifying the operating procedures and maintenance requirements and procedures.
- e. Test and commissioning certificates for mechanical and electrical installations installed or altered as part of the Works.
- f. Design criteria, where design work formed part of the Contract, for structural elements and for electrical and mechanical systems.
- g. Details of existing services and utilities encountered - either underground or in buildings - during the course of the Works, stating their location and describing them.