

**Dunhill EcoPark, Waterford.
Co. Waterford**

***Works Requirement document – Volume A.2.3.
Specification of Performance, Standards and
Materials***

For

Mechanical Services Installation Works

Project Ref: 0595

Date: May 2026

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REV	ISSUE	DATE	DOCUMENT	AUTHOR	APPROVED
T1	Tender Issue	21/05/2026	0595 – Mechanical Specification	KM	JG

SECTION 1: PRELIMINARIES AND GENERAL CLAUSES:

01. Description Of Site:

The site is the existing Dunhill EcoPark, Waterford, which is easily accessible from the road. The site boundaries are defined on the attached drawings, and this Contractor shall confine his operations to the area indicated.

This Contractor shall be deemed to have made a thorough examination of the site and all features thereof, the existing premises, together with all internal and external services, adjoining premises and property or other things affecting the proposed works, to ascertain precisely the nature and extent of same and the condition under which the works will have to be executed, as no claim will be allowed on the grounds of want of knowledge in this respect.

It is the intention of this specification to provide for all work and materials necessary for the completion, testing and setting to work of the installation outlined in this specification and to provide for the supply and erection of all necessary or usual accessories for such an installation, whether such work, materials or accessories shall have been individually itemised or described in this specification or not and also to provide for the maintenance of the installation for twelve months after completion.

CONSULTANTS

The following persons from Geaney's Engineering will be responsible for this project:
Cian/Jerry Geaney - Project Lead – (info@geaneyengineering.ie)

The office phone number for Geaney Engineering is: 051-879371

This Contractor shall be deemed to have made a thorough examination of the site and all features thereof, the existing premises, together with all internal and external services, adjoining premises and property or other things affecting the proposed works, to ascertain precisely the nature and extent of same and the condition under which the works will have to be executed, as no claim will be allowed on the grounds of want of knowledge in this respect.

This specification will set out in general terms the design drawings and data to be used by the Contractor in order to submit a tender bid for the mechanical services installation and the works associated with the installation. The procurement, delivery, supply, handling, erection, installation and commissioning of the services as there under described as may be seen or inferred from the enclosed drawings and documents from the Consulting Engineer.

The Contractor shall satisfy himself that the installation is in accordance with all codes and standards. All works described shall comply with:

Notwithstanding the details of the specification, the contractor must note that, where applicable, this installation must conform in every respect with the full requirements of the most current regulations in terms of health and safety, construction standards, industry guidelines and best work practices, including but not limited to the following standards:

- Safety, Health and Welfare at Work (Construction) Regulations, 2006;
- Safety, Health and Welfare at Work (General Application) (Amendment) (No. 2) Regulations 2021 (S.I. No. 619/2021)

- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2021 (S.I. No. 610/2021)
- Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 (S.I. No. 528/2021)
- Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2020 (S.I. No. 102 of 2020)
- Safety, Health And Welfare At Work (Construction) (Amendment) Regulations 2019 (S.I. No. 129 of 2019)
- Safety, Health and Welfare at Work (General Application) (Amendment) (No.3) Regulations 2016 (S.I. No. 370 of 2016)
- Safety Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013)
- Code of Practice for Indoor Air Quality - HSA
- Safety, Health and Welfare Act 2005 - present;
- Safety, Health and Welfare at Work (General Application) Regulations 2007;
- Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013);
- Local fire officer requirements
- Memorandum on Council Directive 92/57/EEC;
- Construction Industry Research and Information Association: "Control of Risk: A Guide to the Systematic Management of Risk from Construction";
- Building Regulations Technical Guidance Documents;
- Equipment Manufacturers Instructions / Recommendations;
- Relevant BESA Codes of Practice;
- NSAI Gas Standard IS820;
- The Chartered Institution of Building Services Engineers Guidance Documents and codes of practice;
 - CIBSE design codes A, B, C, D, E, F, L, and CIBSE doc: am14:2010
 - Commissioning Codes A, B, C, L, M, R and W
- Electro Technical Council of Ireland;
 - National Rules for Electrical Installations, Latest Edition.
- I.S. EN 1366-1 Part 1 – 2014+A1-2020 – Fire duct, Kitchen Extract & Pressurisation.
- British Standards, including but not limited to,
 - EN 442-1&2:2014
 - BS 5422:2023
 - BS 6880-2:1988
 - EN 13831:2007
 - EN 303-2:2017
 - BS 8558:2015
 - BS 6644:2011
 - EN 1775:2007
- The Energy Efficiency Directive 2012/27/EU;
- European Commission (EC) and European Directives (ED);
- European Harmonisation Directives;
- Electro-Compatibility Regulations 2007;
- Local Authority Fire Safety Requirements;
- EU 2030 Climate target Plan
- REPowerEU Plan
- EU F-Gas Regulations
- SEAI Guidance Documents
- Renewable Energy Directive (2009/28/EC)
- EU ecodesign regulation for local space heaters (EU) 2015/1188

- Energy labelling and ecodesign requirements for local space heaters (2017)
- Harmonised standards for space heaters 2014/C 207/02
- Harmonised standards for water heaters 2014/C 207/03
- EU energy labelling regulation for water heaters 812/2013
- Energy labelling for ventilation units (EU) No 1254/2014
- EU ecodesign regulation for water pumps (EU) No 547/2012
- Harmonised standards for circulators 2013/C 254/04
- Amendment to the Ecodesign for circulators 622/2012
- Ecodesign required for cooking appliances
- Climate Action Plan 2023
- Energy Performance Buildings Directives
- Renewable Energy Directives
- Energy Efficiency Directives
- Current ESB Regulations
- Fire Officers Requirements and Fire Certificate.
- SEAI Triple E Register of Approved Products
- EU Commission Regulation (EC) 640/2009 – Energy Efficiency (Particularly with regard to Fans and Pumps).
- BS EN 378 Parts 1, 2 and 3: Refrigeration Systems and Heat Pumps.
- CIBSE Technical Memorandum TM13: 2013 Minimising the Risk of Legionnaires Disease.
- All other CIBSE Technical Memorandums and Application Manuals.
- HVCA Specifications TR20-Pipework Systems
- HVCA Specifications DW144 Code of Practice for Ventilation Ductwork.
- HVCA Specification TR19-cleanliness of Ventilation Systems.
- BS9999: 2008 Code of practice for Fire Safety.
- Factories Act / Statutory Instruments.
- Client safety protocol
- Client Specifications
- Tender Drawings
- Contract Preliminaries

02. Description Of Works:

The works covered by this specification comprises of the Mechanical Services Installation in the existing refurbished first floor as showing on the drawings attached . These works are to be carried out by a suitably qualified and registered Mechanical Contractor as a domestic contractor to the Main Contractor.

The mechanical contractor is required to carry out the installations to the highest standards using only materials and equipment of the highest quality and reliability. The mechanical services installations shall only be carried out by highly experienced and competent personnel that have been appropriately trained to carry out work of similar nature, scale and complexity.

The contractor shall include all labour, materials, import charges and transport which may be required for and in the construction of works detailed in the Specification and as shown on drawings, and shall provide at this own expense for all necessary power, plant, tackle, machinery, tools, apparatus, instruments, scaffolding, ladders, hoists, fencing, temporary works and other equipment for the workmen and for the erection, testing, demonstration and

commissioning of the complete plant in the manner described, together with the carriage thereof to the spot where they are required to be used and their subsequent removal.

This project is governed by the Building Control (Amendment) Regulations 2014, the mechanical contractor shall allow for the provision of all items associated with the mechanical installation. All work shall be carried out in accordance with relevant statutory instruments and safety regulations, government and local. The installation shall comply with statutory instruments and regulations current at the date of tender proposal.

Overview of Scope Of Works

The mechanical contractor is required to carry out the installations to the highest standards using only materials and equipment of the highest quality and reliability. The mechanical services installations shall only be carried out by highly experienced and competent personnel that have been appropriately trained to carry out work of similar nature, scale and complexity.

The description of tasks explained in the “Scope of Works Section” is a legitimate account of all works that need to be carried out but is in no way an exhausted list of all tasks that need to be completed by the mechanical contractor. The mechanical contractor should envision the full body of work associated in the completion of the work set out in these specification/drawings when developing a tender for the works.

Mechanical and Electrical Tender drawings are coordinated design drawings only. Contractor shall produce coordinated construction drawings for construction purposes. Contractor to ensure adequate access is provided to plant and equipment for purposes of routine servicing, maintenance, and component replacement. Mechanical contractor shall be fully responsible for the complete co-ordination of all M&E services in ceiling voids, risers, HRU boxouts, plantroom etc. All work shall be carried out in accordance with relevant statutory instruments and safety regulations, government and local. The installation shall comply with statutory instruments and regulations current at the date of tender proposal.

DRAINAGE AND REFUSE DISPOSAL - ELEMENT 52

All soils and waste above ground installation shall be as per the accompanying drawings. All above ground soils and waste pipework shall be the responsibility of the mechanical contractor. Soil vent pipes (SVP) will terminate above the roof of the building in a suitable cowl and shall be weatherproofed to suit. Condensate drainage from the MVHR will run to the closest drain point.

HOT AND COLD WATER SERVICES - ELEMENT 53

All water services installation shall be as per the accompanying drawings and relevant schematics. Mains water pipework shall be installed in a non-metallic pipework.

VENTILATION - ELEMENT 57

Ventilation installation shall be as per the accompanying drawings. Fresh air requirements shall be achieved using a mechanical ventilation with heat recovery (MVHR) unit. All ducts

will terminate as shown as in the accompanying drawings. The MVHR shall come complete with Co2 sensors reheat and attenuators

PROTECTIVE SERVICES - ELEMENT 58

Fire protective services installation shall be as per the Scope of Works defined on the drawings

BUILDERS WORK - ELEMENT 60

Builder's work will include off-loading, scaffolding, fire proofing, hole coring, painting and priming of pipework and snagging and tidying and making good all finished work.

Please note that 'The Contractor' in this specification refers to the Mechanical Contractor. Main Contractor refers to the PSCS/Main Builder.

03. Site Conditions:

This Contractor is strongly advised to visit the site and ascertain the facilities of access thereto, the supply of labour and materials the district will afford and general convenience of working. He shall be taken to have made himself acquainted with the nature of the works; the site and all existing systems and all other things insofar as they may have any connection with or effect the works.

Contractors must refer to the Construction Industry Federation standardised approach to commencing construction projects in Ireland which incorporates the COVID-19 public health requirements and ENSURE that all measures required in order to comply with these guidelines are included for. This document is available at www.cif.ie and a copy of same is included with the tender documentation issued for the works.

All the above matters must be considered when tendering and no charge for any extra labour or materials will be allowed in consequence of this Contractors failure to do this.

The Contractor must notify the project Architect/Engineer immediately should site conditions alter significantly from those as stated in the tender documents.

04. Covid 19

The contractor shall allow in his tender for working on site in line with the CIFs Standard Operating Procedure (SOP) and, for any additional time and cost incurred to accommodate the implications of C19 restrictions. Please refer to CIF Construction Sector C-19 Pandemic SOP – V.9 October 2021, and/or all subsequent editions.

Ensure all directly and indirectly employed staff have undergone the CIF's COVID-19 safety induction programme and have a digital card and follow the instructions of the main contractors C-19 compliance officer.

05. Tender/shop Drawings

The design drawings issued within the tender package must be read in conjunction with all relevant project specifications. If the contractor has any queries regarding design drawings issued prior to tendering, they shall notify this office immediately. It shall be otherwise deemed that the contractor has understood and priced for all works as designed.

Contractor will be responsible to cater for the production of shop drawings and coordinate all services including electrical containment.

06. Instructions for Tenders

The Mechanical Contractor shall be deemed, before tendering, to have made a thorough examination of the Drawings, Specifications, Conditions of Contract, the Site and other things affecting the proposed works to ascertain precisely the nature and extent of same and the conditions under which the proposed works will have to be executed.

The Tenderer must complete the tender return / pricing pages accompanying this specification document, in full, where each elemental item is to be priced for separately. The following instructions should be carefully noted by contractors tendering as failure to comply with them may invalidate the tender.

Note 1: Tender must be an official Form of Tender and accompanied by a priced Schedule.

Note 2: Should any doubt exist as to the meaning of any clause, description or dimension shown or described in the drawings, the contractor should refer same in writing to the Engineer not later than two weeks before the latest date for lodgements of tenders. All such queries received together with ruling on the points raised, will be circulated to all Contractors tendering.

Note 3: Attention is particularly drawn to the fact that omission to sign the Form of Tender or to insert therein the total amount of the tender or the making of any alteration or additional whatsoever in the test of the Form of Tender as prepared by the Engineers, may cause the Tender to be rejected. Any unauthorised alteration or addition will not be recognised by the Employer. Any qualification attached to the tender which attempts to vary or detract from the terms which the Contracting Authority has incorporated into its invitation to tender must be withdrawn as failure to do so may result in the tender being disqualified.

Where qualifications have been attached to all or some of the tenders submitted and all the tenderers have refused to withdraw their qualifications, the consulting authority, in order to secure the most economically advantageous price, reserve the right to deal with the most acceptable offer submitted.

Contract Award

The employer does not bind himself to accept the lowest or any tender. Contractors will not be remunerated for any trouble or expenses they may incur in making up their tenders. The award of contract will be made to the contractor whose tender has determined to be the lowest evaluated tender and who meets the required standards capability and financial responsibility.

Tender prices shall include for all labour and materials required for the execution of the works and shall include for all costs in connection therewith, such as freight and transport, insurance of goods and persons, taxes, duties and other such charges current at date of submission of tender and for all charges arising from statutory legislation effecting the cost of labour. The responsibilities regarding knowledge of the operation or amount of any of these charges shall lie with the tenders and no allowance shall be made for them after submission of tender.

The tender must comply fully with all the conditions set out in the contract documents and the services drawings as listed.

Quoted time of delivery of materials on site and time of completion of the contract together with the extent to which the materials are suitable for their purpose and otherwise acceptable as to performance will be taken into consideration in relation to acceptance of tender.

Disclosing Tender

Acceptance of tender documents by a tenderer will be held to imply a guarantee that the amount of his tender will not be disclosed by the tenderer to any person or body prior the lodgement of the tender and that a wholly bona fide tender will be submitted, in default of which the tender shall be deemed invalid.

07. Payment

The Contractor must submit Progress Statements for each Claim and Interim Certificate Amounts may be at the Engineer's Discretion.

08. Pricing:

Un-priced items -Any item left un-priced shall be deemed to be included for in the tender and the cost of the item shall be deemed to be spread across and included in the rates generally.

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

09. Ascertainment of Prices for Variations:

Any oral instructions, directions or explanations given by the Architect or Engineer upon the Works to Mechanical Contractor shall if involving a variation be confirmed in writing by the Mechanical Contractor to the Architect or Engineer within five working days.

The rates in the Priced Bill of Quantities referred to in the clause above applied to the Works shall determine the value of work carried out as a variation when such work is of a character similar to that to which the aforesaid rates apply and is carried out under similar conditions. The aforesaid rates shall also determine the value of any work omitted.

10. Bill Of Quantities:

The contractor shall, within seven days of being requested to, submit to the Engineers a detailed schedule, of rates covering every item fixed, as specified, upon which the sub-contractors estimate has been based. The number of items and quantities shall be given up to the totals as indicated in the Tender Summary.

The bill shall list separately the material costs and labour costs with the number of man-hours included for in the tender.

The Bill of Quantities shall remain with the Engineers until the works are completed and shall form the basis for agreement of variations by measurement. However, the Contract is a lump sum contract and is not subject to re-measurement.

11. Works Programme:

The Mechanical Contractor shall submit an overall program to tie in with the overall works program and include within his Programme, details of his intended timing and order for the construction of the Mechanical Services Works and the dates by which any significant items of information will be required from the Main Contractor.

Key dates and deliverables shall be submitted to the consultant and track records shall be included for each meeting with a red line track of deliverable dates and closed out items.

12. Installation and setting out of works/Builders work Drawings Record

The Contractor shall set out the whole of the works and be responsible for the correctness of the positions, levels and dimensions of the several works. All openings, plinths, bases and holes to be cut in the structure shall be positioned and marked by the Contractor. The tender drawings are diagrammatic only and the Contractor shall allow for a practical installation allowing for the setting around obstructions and other minor modifications which may or may not be apparent from the Architectural, Engineering, Structural, or services drawings.

The exact courses and positions of all pipes, ducts, flues, cabling, conduit, trunking etc. and other items of equipment shall be duly laid out and marked on the job by the Contractor and approved before execution as the best possible course and position, having regard to all considerations including temperature and the proximity to other services plant.

The Contractor shall make good any incorrectly set out works and shall be liable for costs of making good any work incorrectly carried out. The Contractor shall furnish all materials, labour and instruments necessary to enable the setting out to be checked.

Builders work Drawings

Design stage definition

A drawing to show the provisions required to accommodate the services which significantly affect the design of the building structure, fabric and external works. Drawings (and schedules) of work to be carried out by building trade and required to be costed at the tender stage e.g. plant bases.

Installation stage definition

Drawing to show requirements for building works necessary to facilitate the installation of the engineering services (other than where it is appropriate to mark out on site).

Specialist Drawing

A generic term for those drawings which may be supplied by supplier or sub-Contractor appointed to undertake design duties in relation to a specific aspect of project.

Drawing Review

Two hard copies and one soft copy of all of the Contractor's working drawings and builders work drawings will be submitted to the Engineer for review. The drawings submitted by the Contractor for approval will be reviewed by the Engineer, the Architect and the Structural Engineer and their combined comments will be marked upon one copy of the drawing which will be returned to the Contractor.

The Contractor shall make the appropriate amendments to his drawing and then submit one further copy for checking unless the comments have been of sufficient magnitude when the Contractor will be advised that he is required to submit three further copies of the amended drawing for approval. When the Engineer is satisfied that the comments have been correctly incorporated in the drawing, the Contractor will be notified, and he will be instructed to issue ten copies of the approved drawing to the Architect for general distribution.

All submissions for review must be made in writing and the Contractor shall allow in his programme a minimum period of 14 days for the review of drawings. If a drawing submitted for review requires such major alterations to comply with the requirements of the Contract that the process of review cannot be completed within 14 days, any costs arising from the delay in review will be at the Contractor's expense.

13. Guarantees and Warranties

All manufacturers guarantees and warranties on plant, equipment, etc., shall be valid up to the end of the Defects Liability Period.

14. Defects Liability Period:

All manufacturers guarantees and warranties on plant, equipment, etc., shall be valid up to the end of the Defects Liability Period. Refer to the Conditions of Tendering in the Main Contract Document.

Specialist items and all large items of plant shall come with a 5 years parts and maintenance warranty

ESCO items listed shall have a 15-25 years

Operation of Plant

The Contractor shall include for providing personnel and maintaining continuous operation of the plant and systems during 2 weeks prior to the handover of the Works for 24 hours each day for 7 days each week. The Contractor shall be responsible at his own expense for carrying out routine maintenance and for the rectification of defects during this period.

Once the Contractor has satisfied himself that the installation is in satisfactory working order, and expressed to the Engineer in writing his approval to the installation being put into normal service, the Contractor will assume responsibility for running the whole of the Contract

Works for a period of fourteen days from the date of practical completion and shall provide skilled supervision and attention during the required hours. During this period the Contractor shall be responsible for lubricating and maintaining all moving parts.

The Contractor shall, during this running period, indemnify the Employer against any damage or injury to the Sub Contract Works and indemnify the contractor against all actions, suits, claims, demands, costs, charges and expenses arising in connection therewith which will, in the opinion of the Engineer, be occasioned by the negligence of the Contractor, by the use of the Contractor of defective materials or workmanship, or by defective detail design.

15. Samples / Materials And Products:

The Mechanical Contractor shall include for providing samples of components as called for by the Engineer. The samples shall be provided free of charge and shall be used to determine whether the component proposed by the Contractor complies, in the opinion of the Engineer, which shall be binding with the requirements of the Specification. The Contractor shall provide samples of all mechanical equipment or components as requested by the Engineer.

The Mechanical Contractor shall issue details of all specified equipment and plant for approval prior to placing order. All equipment and plant shall be approved on site by the engineer prior to installation. Such approval shall not relieve the Contractor from responsibility for making good any defects which may arise as a consequence of failure or otherwise of any materials during the contract period.

The entire installation shall be constructed from new materials and equipment and all materials and workmanship shall be the best of their respective kinds in accordance with the specification. All materials and equipment selected or proposed by the Contractor shall be provided by manufacturers who have local maintenance and servicing capacity available within the Republic of Ireland as necessary.

All materials used in the works shall be fit for the use for which they are intended and for the conditions in which they are to be used in and includes materials which:

- Bear a CE mark in accordance with the provisions of the Construction Products Directive (89/106/EEC)
- Comply with an appropriate harmonized standard, European technical approval or national technical specification as defined in article 4(2) of the Construction Products Directive (89/106/EEC)
- Comply with an appropriate Irish Standard or Irish Agreement Board Certificate or with an alternative national technical specification of any member state of the European community, which provides in use an equivalent level of safety and suitability.

The installation shall be carried out and maintained in the best and most substantial and workmanlike manner. Workmanship shall comply with British or Irish Standards and the relevant codes of practice.

The economic life expectancy of all mechanical plant and components shall be in line with CIBSE Guide M Appendix 13.A1: Indicative life expectancy factors.

Contractors Submittals

The contractor is permitted to propose alternative equipment/materials in the form of a written submittal. Only one alternative may be included in each submittal to the engineer. The contractor shall be fully responsible for ensuring that the proposed submittal is based on the alternative plant/equipment being equal to or exceeding the technical performance/specification of the product/material.

Each submittal shall be presented with a signed certificate/statement from the supplier/manufacturer confirming that the proposed alternative has been fully assessed in terms of satisfying the requirements of the consultant's specification document and that the proposed alternative is at least equal in terms of performance, quality and reliability.

A maximum of two submittals shall be permitted for any equipment or material.

Should the submittals be found to be non-compliant with the specification/works requirement following a maximum of two presentations, the contractor shall then revert to the specified product/material set out in the specification document.

The consultant's acceptance of a submittal is based on the contractor having fully checked compliance with the specification and the information in the contractor's certificate being accurate in terms of meeting the specification requirements.

Should the equipment/materials be found to be lacking in performance or quality following the installation of same, the contractor shall remove and replace the installed equipment/materials at no cost, with the specified type to the satisfaction of the consulting engineer.

Where samples for alternative equipment are required, the contractor shall supply a sample of both the specified product and the proposed alternative for examining by the consulting engineer.

Appropriateness and suitability of any contractors' proposal shall be subject to the approval of the consulting engineer. The consulting engineers' decision on the matter shall be final and shall not be subject to challenge by the contractor. The consulting engineer will assess the proposal on the basis of compliance with technical performance, design intent, quality, conformance, durability, robustness, life cycle cost, appearance and finishes.

16. CE Marking

All mechanical equipment, systems supplied and installed shall conform to the appropriate EU Directives and shall carry the applicable CE Marking.

17. Triple E Register

The Triple E Products Register is a benchmark register of best-in-class energy efficient products. The European Union (Energy Efficient Public Procurement) Regulations 2011, SI 151 of 2011, state “a public body shall only procure equipment or vehicles which are (a) listed on the Register or (b) satisfy the published SEAI energy efficiency criteria for the equipment or vehicle concerned, and the public body shall specify this requirement in any documentation describing its procurement requirements”.

The contractor shall ensure that all products or mechanical equipment installed in schools are listed on the Sustainable Energy Authority Ireland’s (SEAI) Triple E lists of energy efficient equipment or are compatible with the criteria of the Triple E evaluation scheme.

18. Builders Work:

The Mechanical Contractor shall be responsible for the correct marking out and providing all builder’s works information/drawings to enable the Main Contractor to fulfil his obligations with regard to Builder’s Attendances.

Where services pass through partitions (walls, ceilings) the Mechanical Contractor shall maintain the fire rating if applicable within the services e.g. Fire dampers in ductwork etc. The Mechanical Contractor shall refer to the Architect to identify all Fire Walls within the areas of works.

The main contractor shall be responsible for making good of all builder’s work opes around services and ensuring that the making good does not damage the services installed.

19. Coordination Works:

The Mechanical Contractor shall allow for liaising with all other trades in relation to coordination. Before any works are started on site, the Mechanical Contractor shall hold a meeting with the Electrical Contractor to co-ordinate the M&E installations in the building. The co-ordination of the electrical installations shall be the responsibility of the electrical Contractor, but the Mechanical Contractor shall allow for co-ordinating the electrical installation with the Electrical Contractor.

The Mechanical Contractor shall mark out opes and holes on all floor and wall surfaces as required to the satisfaction of Services Engineer, Structural Engineer and Main Contractor in sufficient time to allow the Main Contractor to complete his works to programme.

20. Supervision:

The Contractor shall make available throughout the duration of the works a Project Supervisor or Site Foreman with appropriate qualifications and or experience to attend site meetings and receive instructions as are necessary for the execution of the contract, and to carry out superintendence of the works on site. The Project Supervisor /Site Foreman shall keep accurate records and details of all aspects of the works as necessary.

21. Labour:

This Contractor shall ensure that all employees are registered for PAYE / PRSI and that all employees have successfully completed a SafePass course. Only fully qualified and competent tradesmen, together with their necessary labourers, or helpers, shall be employed by the Contractor on the works, which shall be carried out and completed in the best substantial manner.

22. Site Establishment:

It is the responsibility of the Main Contractor to provide adequate temporary water, power and lighting supply for the duration of the Construction period.

23. Protection of Existing Services:

When stripping out the redundant services the Contractor shall ensure that no unnecessary damage is caused to either the equipment and/or the building fabric which is to be retained. This Contractor shall make good, at his own expense any damage caused whatsoever to existing services to the complete satisfaction of and in accordance with the instructions of the Engineer/Statutory Authority concerned and shall keep the Client indemnified at all times from claims in connection with the damage. Contractor shall allow for in his tender price a full dilapidation survey highlighting any previous damage

24. Electricity Supply:

The electricity supply to this project will be 380/220 Volts, 50 cycles, and all electrical plant and equipment must be suitable for this supply. Contractor is responsible for temporary Power on the site. Main contractor shall engage with the ESB for works that link in with the program

25. Wiring Details:

The General rules for wiring of supplies of Electrical Energy, as laid down by the Electro Technical Council of Ireland, National Rules for Electrical Installations, 5th Edition IS 10101:2020, together with the regulation laid down by the E.S.B., shall be strictly adhered to, as shall the requirements of the 18th Edition of the I.E.E. Rules and Regulations.

26. Trade Name

Any reference to Trade names shall be for the purpose of describing the Specification standard of the article or material to be used and it does not imply that the specified trade name solely must be used.

27. Inspection Prior to Concealment

Where work requiring inspection or testing is subsequently to be concealed, due notice shall be given to the Main Contractor/Engineer to accommodate necessary inspection and witnessing of testing where required before concealment. Failure to give due notice, of at least 48 hours, shall necessitate the Contractor uncovering the work and reinstating at their own expense.

The Engineer reserves the right to forego its inspection; however this will in no way relieve the Contractor's responsibility to comply with the specification and drawings. All work that is not installed to the required standard or does not demonstrate adequate co-ordination with the building and other services must be removed and re-installed in full compliance with the tender documentation and relevant standards at the Contractor's cost and without any associated increase in the project program

28. Tests/Commissioning On Completion:

The contractor shall test all installations on completion in accordance with standard test procedures, that is, relevant I.S. / B.S. / E.S. and Codes of Practice.

The Contractor shall notify the Main Contractor in writing when the mechanical services installation or parts thereof are ready for testing and commissioning, allowing sufficient time period for programming the testing, commissioning and handover of the systems. The contractor shall issue a seven day notice period to the Engineer prior to tests being carried out to allow for the Project Engineer to witness, if he so wishes.

The Contractor shall prove that all test results are in accordance with the performance based specification issued, and furnish the project Engineer with the report / certificate issued by the specialist commissioning company. All test / commissioning certificates are to be included in the project O&M manual.

29. BC(A)R 2014 Building Control (Amendment) Regulations:

The mechanical specialist shall allow in full, for compliance with all statutory obligations under the Building Control (Amendment) Regulations BC(A)R, S.1.9 of 2014, including all revisions thereafter.

Contractor shall be responsible for keeping a record of all inspection reports with a close out response to individual items or snags

30. Making Good Damage:

The Contractor shall inspect all equipment and materials on arrival on site for defects or any failure to meet the specification and shall replace any defective equipment or materials as necessary.

The Contractor shall take all necessary precautions to ensure that there is no damage or defacements caused by their employees or representatives to the furniture, fittings or other equipment within the buildings or to the premises themselves or to adjoining premises, and shall make good at their own expense any damage caused to the premises or its contents during the works, to the entire satisfaction of the Employer's Representative.

31. Instruction:

This Contractor shall liaise with the Main Contractor in providing for instructing the Employer in the operation of the mechanical services installations on completion of the installation works.

He shall provide two sets of record drawings, for the installed systems and full operating and maintenance manuals.

32. Drawings:

Copies of drawings of the building are issued with each Specification. Dimensions and other information shown on the drawings forming part of the Contract are believed to be correct, but no responsibility for same is accepted. This Contractor should note that, prior to finally positioning and outlets or fittings, these must be agreed with the Engineer. The Contractor shall be responsible for the setting out of the work and he shall rectify any errors he may make, either in setting out the work or during its progress.

The Contractor shall not deviate in the execution of the work from the Specification or Drawings herein referred to, except upon written order signed by the Employers Representative authorising such deviation.

This Contractor shall keep on site a full set of the Construction Drawings, on which he shall record and note the actual layout of all the mechanical services installations as installed, including routes. This Contractor shall include for the preparation of final marked-up drawings, in auto CAD, at practical completion stage of the project.

33. Maintenance:

The works shall be maintained by the Contractor in perfect condition for 12 months after the issue of the Engineers certificate of practical completion and any work or material exhibiting defects during that period shall be made good by the Contractor at his own expense.

34. Tax Clearance Certificate & C.I.F. Pension/Sick Pay Scheme:

It will be a condition for the award of the Contract that the firm being considered must be able to produce, within seven days of being requested to do so, a Tax Clearance Certificate from the Collector General of Taxes, Sarsfield House, Limerick and provide evidence of Membership of the Construction Industry Federation (C.I.F.) Pension/Sick Pay Scheme.

35. Insurances:

The Contractor shall comply with the requirements of Clause 10 of the “Short Public Works Contract” relating to Insurance and Compensation. He shall effect adequate insurance in his own name and also in the name of the Employer to cover all the risks or claims specified in the aforesaid “Short Public Works Contract” and shall hold the Employer indemnified against all such claims and risk in anyway arising out of the works included in the Contract.

The minimum sum for public liability insurance shall be €6,500,000.00 (six million, five hundred thousand euro) for any single claim, including employer’s liability of €13,000,000.00 (thirteen million euro) and including all risks as stated in the attached “Tender and Schedule.

CONTRACT SAFETY AND HEALTH PROCEDURES:

Introduction

The Contractor shall note the Preliminary Safety and Health Plan prepared by the Project Supervisor for Design Stage, information included within this report and include all costs relating to compliance with that set out within the various Sections of the Preliminary Safety and Health Plan.

The Contractor shall include for complying with the Safety, Health and Welfare at Work Acts and Regulations current at the date of tender.

The Contractor shall include for providing all necessary information as requested by the Project Supervisor for the Construction Stage to enable the preparation and completion of the Safety File.

The Contractor shall include for "As Built" drawings for inclusion in the Safety File.

The Contractor shall hand over all documentation in connection with the Safety File and full information must be handed over for sign off, to the PSDP prior to Practical Completion Certificate been issued

Procure and maintain insurance cover and provide indemnity in respect of any claim incurred by reason of the performance of functions and duties of the project supervisor for the Construction Stage of the Project. Assist in preparing and completing the Safety File.

Regulations

The Contractor shall comply and adhere to the general principles of prevention as stated in the following:

- Safety, Health and Welfare Act 2005 - Present;
- Safety, Health and Welfare at Work (General Application) Regulations 2007;
- Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013);
- Memorandum on Council Directive 92/57/EEC; and
- Construction Industry Research and Information Association: "Control of Risk: A Guide to the Systematic Management of Risk from Construction", Report FR/CP/32, 1995.
- Safety, Health and Welfare Act (Chemical Agents) Regulations (2015)

B1. BASIC LEGAL REQUIREMENTS:

Contractors must comply with the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021 and any other statutory provisions and common law duties. Steps must be taken to ensure the provision of adequate and suitable plant and equipment.

Only those Contractors and Employees having appropriate training and experience should be allowed work, on the premises. The Contractor shall appoint a Project Supervisor as required by the Site Health and Safety Regulations.

B2. SAFETY COMMUNICATION:

The Contractor is required to ensure that all the Employees, Sub-Contractors and all their Employees, whilst on the Company premises are informed of the Health and Safety Rules and Procedures.

B3. PERIOD OF WORK:

The Contractor must notify the Project Co-ordinator in an appropriate way before commencing and on completion of their task. Prior application must be made for any work to be undertaken outside of normal office hours.

If work is to be phased, the method of phasing the work is to be prepared, agreed and distributed to all parties.

B4. VEHICLES:

Vehicles used by Contractors or their Employees are allowed on the Companies premises for delivery, parking or collection subject to local instructions. All drivers are requested to exercise maximum care when on Company premises and particularly when Employees or Members of the Public are entering or leaving.

Drivers of large vehicles operating in confined circumstances must ensure there is a person in attendance to assist with reversing etc.

B5. DELIVERY AND DEPOSIT OF MATERIALS AND GOODS:

No materials, goods or equipment shall be stored in Plant Rooms or placed so as to obstruct general work areas, gangways or fire exit routes.

All rubbish especially dangerous or flammable materials must be removed from the premises daily.

B6. CONTRACTORS WORK AREA:

The Contractor must keep locked, the doors to flat roofs with unprotected edges, plant rooms and electrical apparatus, unless in attendance. Where possible, the Contractor's work should be clearly defined and physically separated from all parts of the premises. The area may be marked by a temporary partition or tape backed up with warning signs.

The segregated area will become the responsibility of the Contractor. Visitors to Contractor's work must be accompanied by Contractors representative. Under no circumstances should portable or temporary methods of heating be introduced to the Contractors Area, without prior written authorisation.

B7. RAISED SURFACES, HOLES AND PROJECTIONS:

Raised surfaces, holes, trailing leads or surface and projecting equipment must not be left at any time without taking the necessary safety precautions. All opening must be securely

fenced or covered over and marked with warning notices. Loose materials of whatever kind must not be left about or allowed to obstruct the roadway, gangways or working area.

B8. FIRE EQUIPMENT:

The removal or obstruction of Fire Extinguishing Equipment from its original location is prohibited. A Contractor is responsible for providing and maintaining any specialised fire extinguishers and equipment for the work in progress.

B9. EVACUATION OF BUILDING:

The contractor must read Fire Instructions displayed on the premises and comply in the event of an emergency evacuation. He/she is not to eliminate or diminish exists during alterations.

B10. EXISTING SERVICES:

It is the Contractors responsibility to ascertain the existence and whereabouts of electrical cables, drains, air, gas, and water mains. The Contractor must familiarise himself/herself and how to operate the main and/or local isolation points for services before starting work and in anticipation of an emergency. Phasing will be the responsibility of both the construction team and design team lead it shall be set out by the design stage.

B11. PLANT, TOOLS, AND EQUIPMENT:

All plant, tools and equipment brought onto the Company's premises should be of safe design and in a safe condition. Particular attention must be given to checking the electrical and mechanical integrity of any hired equipment. Earth leakage circuit breakers should be fitted on all 220-volt cables. Equipment operating at 110 volts is preferable.

B12. SAFEGUARDING OF MACHINERY:

All machines such as circular saw tables and pipe threaders must be guarded in accordance with statutory requirements.

B13. SAFETY STATEMENT:

Contractors are required to have safety statements available for inspection by the Clients H.S. and W. offices. They are also required to prepare method statements when undertaking tasks requiring special skills or technology.

B14. PORTABLE ACCESS EQUIPMENT:

Where ladders, step-ladders and trestles are necessary, they must be used in a safe manner for work to be done. Ladders should be securely tied at the top or held by a person at the bottom unless they incorporate suitable safety devices. The equipment should be of suitable construction and free from defect. Equipment and materials must be carefully moved and not thrown or dropped from a height.

B15. WARNING OF DANGER:

Care must be taken, at all times to protect the Client's employees and members of the public from danger and to protect property and work in progress from damage.

Any circumstances which give rise to such danger or damage must be reported immediately.

B16. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING:

All Contractors employees must be issued with, and make full use of, all such protective equipment or clothing, as required by statute or any regulations made thereunder. They must also meet any locally agreed requirements for protecting the employee, e.g., for the use of safety helmets and protective footwear.

B17. ACCIDENTS:

In addition to the statutory obligations for Contractors to report dangerous occurrences and accidents to the appropriate authority, all accidents must be reported to the safety co-ordinator of the Clients.

B18. HOT WORK:

In the event of the Contractor carrying out any of the following works he must carry the appropriate insurance and also comply with all the procedures and safety precautions set out in this insurances:

- ☐ All activities involving flame.
- ☐ Hot air or arch welding and cutting equipment.
- ☐ Braising and soldering equipment and blow lamps.
- ☐ Bitumen boilers and other equipment producing heat or having naked flam

B19. SAFETY, HEALTH, WELFARE & ENVIRONMENTAL ISSUES

This Contractor shall comply fully with all statutory safety, health and welfare regulations regarding work people, including those employed by Sub-Contractors employed on the site and particularly the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021 and provide all relevant details to the Main Contractor to carry out the function of Safety Planning Supervisor for the construction phase of the works.

This Contractor shall comply in all respects with the Factories and Safety in Industry Acts and any other Acts and with any Statutory Instruments or Regulations issued thereunder.

This Contractor is required to provide a safety method statement clearly indicating the proposed sequence of his works and the precautions he will be taking at each stage in the works to protect his employees, and those of the main contractor, other sub-contractors, visitors and the Employers personnel and any plant and equipment, etc. Full details of any chemicals or substances proposed to be used in the project construction process should also be detailed fully and the Employer's prior written approval received for it's use.

This Contractor shall include for complying with the Safety, Health and Welfare at Work Acts and Regulations current at the date of tender.

The Main Contractor shall be appointed by the Client under a collateral agreement to the main contract as Project Supervisor for the Construction Stage in respect of the project pursuant to the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021. This Contractor shall include all costs for the provision of the necessary services and details to the Main Contractor to perform his duties as Project Supervisor for the Construction Stage pursuant to Regulations 6 and 7 of the Regulations.

This Contractor shall include for providing all necessary information as requested by the Project Supervisor for the Construction Stage to enable the preparation and completion of the Safety File including record drawings, specifications, maintenance and operating manuals and commissioning certificates. The record drawings and Maintenance Manuals shall be as required under previous clauses of this document.

B20. COMPLIANCE

We can confirm that our design considers all the requirements as outlined in the current health and safety regulations and we have taken every practical step ensuring that the installations we design can be safely installed, used and maintained

SPECIFICATION PARTICULARS:

ELEMENT (52) : DRAINAGE AND REFUSE DISPOSAL

52.1 Extent And Programme Of Works

This section covers the running of soils and wastes from sanitary and other water using fittings from the waste outlets to the main soil vent stacks and to the underground drainage system, which will terminate just above ground floor level. Pipework includes anti-syphons and vent connections and traps to all fittings but **not** sink units, taps and waste outlets. The drain from the MVHR unit as shown shall be allowed for.

52.2 Soil And Waste Pipework

Soil and waste pipes generally shall be run in PVC pipe complying with BS 4514 with fittings generally in PVC complying with BS 5255. Other plastics such as polypropylene and high density polyethylene may be used for particular fittings and applications. Joints shall be solvent welded on PVC pipe, but special sockets with synthetic O-rings may be used in some cases, particularly with polypropylene. On no account shall solvents be used for jointing on polypropylene.

Pipe ends shall be cut square using a fine tooth saw and all swarf shall be removed with glass paper. The cut end of the pipe and the socket into which it shall be inserted shall be cleaned with a patent cleaner recommended by the pipe manufacturer. In the case of PVC pipe an approved solvent welding cement shall then be applied to both cleaned surfaces in accordance with the manufacturing instructions.

The pipe shall then be fully inserted into the socket with a slight twisting motion and any excess solvent removed with a clean cloth. The joint should then be held firm in position for at least 20 seconds to allow it to set and should not be handled for about 2 minutes.

In certain instances where soils and wastes are exposed on wall surfaces, wastes may be run in light gauge copper, painted or chromium plated as indicated on the drawings.

52.3 Soil And Waste Pipe Connections

Allow for connecting the outlets of all sanitary and other fittings with waste outlets to the soil or waste pipework as appropriate. Traps generally shall be in polypropylene unless otherwise stated, mounted immediately below the fitting and complying with BS 5572. All traps shall be accessible and provided with adequate facilities for cleaning, and where necessary shall be capable of being easily dismantled or removed. Traps from bowl type urinals should be in brass chromium plated, where required.

Traps with outlets for pipes up to and including 50 mm size should have minimum water seal of 75 mm and where over 50 mm outlet the seal should not be less than 50 mm unless otherwise indicated.

52.4 Soil And Waste Pipe Supports

Plastic pipe used for soil and waste installations shall be supported generally as outlined in the Guide published by the Institute of Plumbing. Supports shall be spaced at not more than 12 times the diameter of PVC pipe 32 mm and above whilst vertical pipes should be supported at intervals not greater than 24 times the pipe diameter. UPVC pipe should be supported at intervals not greater than 8 times the diameter of the pipe.

Pipe supports should be by a suitably designed galvanised metal collar or intermediate bracket and suspension for fixing to wall or underside of floor. Collars on vertical pipes should be located so that the support is at the boss branch. Metal pipe clips can be adapted to suit the outside of a vertical pipe by the addition of a barrel clip collar. UPVC pipe clips should be used between anchor points on vertical pipes when it is necessary to accommodate some movement due to thermal expansion.

52.5 Blank Caps And Cleaning Doors

Blank caps and cleaning doors shall be provided at all branches and other locations where rodding access is necessary for cleaning or removal of blockages. Generally their position shall be at branches as indicated on the drawings but the Contractor shall review the proposed runs before installation and shall consult with the Engineer before installation commences to see whether any additional cleaning doors are necessary.

52.6 Vent Pipes

All vent pipes shall be taken to roof level as indicated on the drawing and shall terminate in a patent vent cowl, which shall be supplied and installed by the main contractor in accordance with the manufacturers details.

52.7 Connections To Main Contractors Drainage

Make off all soil and waste connections to the sockets provided under the main building contract, and which generally are to finish flush or close to the floor. Where this is of PVC a joint ring socket should be located at ground level to allow for some differential movement without damaging the vertical stack.

Where connections are to cast iron, a ring seal collar shall be fitted and caulked with lead and gaskin. Where the connection is to a clay drainpipe a 2 : 1 sand and cement adapter and gaskin shall be used around the ring seal.

52.8 Overflows From WC Cisterns

All WC and other flushing cisterns are to have built in overflows. Should any other fittings be proposed, the Contractor shall contact the Engineer immediately for instructions.

52.9 Inspection And Testing:

All sanitary pipework installations shall be tested in accordance with BS 5572. Inspections and tests should be carried out as the work proceeds to ensure that all work is free from defects, sound and unblocked before building work enclosing it or making it more difficult of access proceeds.

Completed works should be carefully inspected to see that no foreign matter is lodged or has adhered within the pipes, and no jointing material projects therein. It should then be tested for soundness and performance.

The soundness test should be carried out by charging the water seals of all fittings and inserting test plugs or bags in to the open ends of all pipes to be tested, a small quantity of water being admitted to the lowest plug or bag to ensure a good seal. A tee piece should be provided on one opening, fitted with a cock at each end. A manometer should then be connected to one of the cocks so as to measure the air pressure inside.

Alternatively, the manometer can be connected through a suitably modified plug, or through a flexible tube inserted through a water seal, any water in the flexible tube being removed. Air should then be pumped in to the system until a pressure of 38 mm w.g. is achieved, when the cock on the air line should be closed, the pressure should be maintained constant for five minutes.

Should a drop in pressure indicate a leakage at a joint this should be located by applying a soap solution to the joint, those leaking being identified by the soap bubbles. Smoke should not be used on UPVC and MPVC pipes due to the risk of naphtha damage.

When the system is complete it should be tested to ensure that all appliances drain speedily, quietly and completely, after which it should be tested for self and induced siphonage in branches, and for induced siphonage and back pressure in discharge stacks, as set out in BS 5572. Fittings should be filled to overflowing, the plug pulled, and the seal checked by dipstick or otherwise after emptying to ensure that at least 25 mm seal remains.

WC's should be similarly tested by flushing. Each test should be repeated 3 times, and the maximum losses of seal taken as the significant result. Where a range of appliances is connected to a common discharge, the number to be tested simultaneously should be as set out in Table 14 of BS 5572, the seal remaining in all traps being measured at the end of the discharge.

Tests for induced siphonage and back pressure in discharge stacks should be carried out by discharging the requisite number of fittings close to the top of the stack, simultaneously, as set out in Table 14 referred to above. Baths should not be used for discharge in either case.

52.10 Fire Stopping Of Soils And Wastes Pipes

Soils and wastes pipes of 40 mm diameter and over, where passing through fire compartments (i.e. floor to floor) or between compartments on the same level shall be fitted with fire sleeves.

The fire sleeves shall be of galvanised steel with an intumescent liner which shall enclose the P.V.C. pipe where it passes through the wall, floor or ceiling and which shall when reaching a temperature of approximately 150°C expand inwards to close the P.V.C. pipe and seal the aperture completely against the passage of flame and fumes.

52.11 Disconnection and Removal of Obsolete Services Complete

This includes the disconnection and removal, off site of the existing soils and waste pipework etc.

The contractor is strongly advised to visit the site to familiarise himself with the full extent of the works to be disconnected and removed. The contractors attention is drawn to the fact that no allowance will be made due to lack of knowledge of the existing on site conditions and the extent of the works to be disconnected and removed as part of this element of the works.

ELEMENT (53) : MAINS WATER HOT & COLD WATER SERVICES

53.1 Extent Of Works In This Section

This section covers the connection and extend of the existing mains water service on the site as showing and detailed on the attached drawings

53.2 Pipework

All pipework for the hot and cold water services shall be in light gauge copper complying with Irish Standard IS 238 and BS 2871 with brazed joints. Compression fittings shall not be used except with the expressed approval of the Engineers.

Copper pipework shall either be certified as complying with the Irish Standard Specification I.S.238 in accordance with the Irish Standard Authority of Ireland on behalf of the Institute of Industrial Research and Standards and shall bear the Irish Standard Mark or shall be certified to an international standard or a national standard of another Member State of the European Community which provides an equivalent guarantee of safety and suitability.

53.3 Pipe Supports

Pipework where run on the surface shall be supported by means of bronze brackets built-in or screwed on according to location. In certain positions single or multiple brackets may be used.

Pipework run in horizontal formation at high level, or in the false ceilings/roof space shall be supported on unistrut sections supported from the underside of the concrete slab or roof steelwork with drop rods. Pipework shall rest on patent individual pipe rollers fixed to the unistrut channel.

53.4 Control Valves And Stop Cocks

Stopcocks of the 'Ballofix' type or similar approved, shall be provided where indicated or required to allow isolation of supply for renewal of washers or other maintenance. Where possible they shall be so arranged as to control fittings or groups of fittings in individual locations, and shall be mounted in such positions as to be screened by the fittings. No stopcocks shall be fitted in an exposed position except with the Engineers approval. Stopcocks shall be fitted to all branches of the external water main.

Cocks shall be gunmetal gland pattern, key operated, and shall be supplied with a suitable key, and hinged C.I. cover which shall be handed over to the main contractor for fitting to a concrete chamber provided by him.

53.5 Pipe Sleeves

In all places where pipes pass through solid walls or floors suitable sleeves shall be provided and fitted at such points. Sleeves shall be in one length and to be fixed flush with the surface of the finished wall or floor.

53.6 Wall And Ceiling Plates

The Contractor shall supply and install wall, floor and ceiling plates on all pipes which are installed through floors, walls or ceilings. These shall be of set screw pattern zinc alloy die castings type with chromium plated finish, all to the approval of the Engineers. They should be heavy quality Halls Thimble type or equal approved.

53.7 Branches And Connections To Fittings

All sanitary fittings complete with taps shall be supplied and placed in position by others.

All branches from the mains to fittings shall be located in the position shown on the drawings and shall generally be run on the surface except where otherwise indicated, or where concealed by wall fittings. They shall be secured by bronze pipe saddles multiple or single according to location, and securely fixed to the wall. Connections to fitting shall be made with a copper to iron adapter, Braided flexible connections shall be provided as required.

53.8 Special Risk Fire Posts:

Special risk fire posts shall be established and equipped in the positions as detailed in the attached schedule. They shall conform to the following and shall comply with I.S.290 : 1986 and I.S.291 : 1986. The foam spray extinguisher (AFFF) shall be 6 litre capacity and the Co2 extinguisher shall be 3 kg, all located internally and wall mounted.

53.9 Insulation:

All hot and cold water services pipework in rising ducts in ceiling spaces in wall cavities in tank room or anywhere there is a risk of causing condensation shall be insulated with performed rigid insulation sections of density 80 kg/m² fixed with circumferential bands of non-ferrous metal, plastic fabric of approved adhesive sheet.

Finish to insulation on concealed pipework shall be canvass or performed sections, factory applied, and secured on site with adhesive and bands. Finish to insulation on visible pipework shall be pliable plastic performed, taped and sealed with adhesive or wrapped and sewn on, left unpainted. Insulation thickness shall be as follows:

Pipework up to 50 mm bore	32 mm thickness
Pipework 65 mm and over	40 mm thickness

Valves below 25 mm bore need not be insulated. Valves of 25mm bore and above shall have their bodies and flanges insulated with performed muff covers arranged for easy removal, finished with fabric sewn-on or applied with adhesive.

53.10 Testing:

After the installation is complete but before the insulation is applied the pipework and valves shall be hydraulically tested to 7 bar (about 100 psi) and shall remain droptight at

that pressure for a period of eight hours. All fittings shall be disconnected during the hydraulic test, and open ends capped. All brazes shall be lightly hammer tested and pulled by hand while under pressure. Should any leakage occur, the Contractor is to make good at his own expense, notwithstanding that previous tests may have been satisfactory. If necessary the Contractor may be required to test the system in sections and no extra will be allowed on this account unless previously agreed. After a satisfactory test under cold water pressure and once the insulation has been applied, the valves connecting the circulating mains shall be opened up and the system shall be operated to ascertain that circulation is satisfactory. The Contractor shall be held responsible for the efficient working of the system (faulty design excluded) and for defects arising from faulty materials and workmanship.

Outlets shall then be opened one at a time to demonstrate that they can deliver the requisite flow of water, after which about 1/5th of those installed shall be opened simultaneously to demonstrate that the system can meet normal load in a satisfactory manner.

The Contractor shall demonstrate that all thermostatic mixing valves can maintain the range of temperatures on the valve control plate to the engineers satisfaction. The Engineer is to be duly notified before each test is made.

53.11 Commissioning

The Contractor shall include for instructing the personnel responsible for the operation of the system in the correct operation and maintenance of the entire system. During the commissioning period he shall go over with them the commissioning and servicing manuals and shall ensure that they understand fully and are properly instructed in planned maintenance of all aspects of the plant. A signed statement from the employer stating that such instructions have been given will be required.

53.12 Labelling

All valves etc., shall be carefully labelled to indicate their purpose, size and duty. Labels shall be manufactured from 3 mm thick brass plate chromium plated and having the wording engraved in 6 mm high block lettering. They shall be secured to the apparatus concerned by 3 mm diameter chromium plated screws.

53.13 Painting

All exposed metalwork shall be thoroughly wire brushed and painted with two coats of approved rust inhibiting paint. The Contractor shall pay special attention to the pipe supports in the under floor ducts ensuring that they are completely protected against corrosion.

53.14 Chlorination of system

The contractor shall include for the chlorination of the domestic services pipework systems, new works on completion of the systems but prior to the clients taking occupation, in accordance with BS6700.1997 Standards. Evidence must be provided that the system is fully treated in accordance with the standards and a signed statement

to this effect must be presented to the engineer at practical completion stage of this project.

53.15 Disconnection and Stripping out of Obsolete Services

This includes the disconnection and removal, off site of all existing water services. The contractor is strongly advised to visit the site to familiarise himself with the full extent of the works to be disconnected and removed. The contractors attention is drawn to the fact that no allowance will be made due to lack of knowledge of the existing on site conditions and the extent of the works to be disconnected and removed as part of this element of the works.

ELEMENT (57) : VENTILATION SERVICES

57.1 Extent Of Works In This Section

This section includes for the new MVHR unit, as shown and as detailed on the accompanying drawings.

57.2 Ductwork

The Contractor shall supply and install sheet metal ductwork as shown on the accompanying drawings. The sizes of the ductwork shall be as indicated on the drawings but the Contractor shall satisfy himself that the ducts can be accommodated in the positions shown before proceeding with fabrication. The ductwork shall be constructed of best quality galvanised sheet steel complying with B.S.EN10143 : 1993 and fabricated in accordance with good practice in a neat and workmanlike manner true to size and internally free from sharp edges and obstructions.

All ducting where the width or height dimension is more than 600 mm must be cross broken during construction so that when erected it shall be rigid and free from movement or drumming, and truly airtight under all operating conditions.

The gauge of sheet metal used shall be as follows:

- Up to 300 mm longest side 22 BG
- Over 300 mm and up to 530 mm 20 BG
- Over 530 mm and up to 1500 mm 18 BG

All ductwork shall be jointed in accordance with the following:

- Up to 300 mm longest side-slip joints and self-tapping screws
- Over 300 mm longest side as detailed below.

<u>Longest Side</u>	<u>Gauge</u>	<u>Distance Apart of joints</u>	<u>M/S Angle sections for duct stiffening and at joints</u>
Up to 300 mm	22	2 metres	Slip joints
300 to 500 mm	20	2 metres	25 mm x 25 mm x 12.5 mm
500 to 1000 mm	18	2 metres	31.75 mm x 31.75 mm x 4.75 mm

Joints shall be properly made with jointing compound and tightened up with nuts and bolts. Flat washers to be provided under all nuts, and nuts, bolts and washers shall be rust proofed. Access doors at least 200 mm diameter with suitable airtight sealing gasket shall be provided in the ductwork at each side of all dampers.

57.3 Ductwork Supports

All ductwork shall be supported at 1.5 metres intervals irrespective of size.

The supports shall be as indicated on the drawings and in general shall consist of two 6.35 mm diameter drop rods connected under the duct by means of 19.05 mm x 25.4 channel manufactured from 14 s.w.g. galvanised mild steel with 38.1 mm x 9.525 mm thick soft rubber inserted between the ductwork and bracket and secured to the latter by a suitable adhesive. The insert shall extend over the complete width of the duct.

The drop rods shall be threaded and screwed into suitable fixings "Rawlsets" "Redheads" or similar to approval. The bottom of the suspension rods shall be threaded at least 76 mm to allow for height adjustment and when finally located at level, locknuts shall be fitted.

57.4 Access Doors

Access doors at least 200 mm diameter with suitable airtight sealing gasket shall be provided in the ductwork at each side of all dampers, heater batteries, duct stats and other accessories.

57.5 Turning Vanes

Double thickness galvanised sheet metal turning vanes shall be installed in all right angle bends and at all supply duct branches and at all splitter dampers and should be fitted in such a manner that no vibration shall occur.

57.6 Balancing And Control Dampers

The Contractor shall supply, deliver, erect and adjust balancing and control dampers in the ductwork to the sizes and in the locations indicated on the drawings.

Dampers shall have low profile aerofoil blades and concealed linkage.

57.7 Grilles And Diffusers

The Contractor shall supply, deliver and install extract grilles in the positions and to the size and type as scheduled on the accompanying drawing / detailed at the back of this specification document.

The grilles, incorporating dampers, shall be manufactured of anodised aluminium. The Contractor shall also include for the supply and fixing of 12 swg galvanised sheet metal spigots to suit each grille size. All grilles shall be fitted with suitable sealing strips around their complete periphery and the grilles shall be fixed so that no air leaks occur.

57.8 Extract Fans

The Contractor shall supply, deliver and install the extract fans in the positions indicated of material specification, the applicable standards and the performance specified and as scheduled on the accompanying drawings. The fans shall incorporate mechanically operated back draught shutter.

Fans shall be provided with matching speed controllers an inline duct attenuator section and the fan suction side, as scheduled.

57.9 Ductwork Connections To Grilles And Diffusers

The Contractor shall ensure that special care is taken to ensure an airtight joint between the ductwork and other components of the extract system. All joints shall be covered with approved sealing bands and soft rubber gaskets shall be used on flange bolts.

Approved type flexible jointing material shall be used at flexible joints in ductwork and where ductwork is connected to any item of equipment likely to create vibration.

57.10 Test Points:

Test points for commissioning shall be provided, as required. These shall consist of 25 mm threaded brass parallel nipple braces to the duct and fitted with 25 mm blank cap for air tight seal.

57.11 Air Registers:

This includes for the supply and fixing of all supply and return / exhaust air registers, as shown and as scheduled.

57.12 Supports:

Ductwork systems shall be supported in accordance with DW 142 for low velocity ductwork systems.

57.13 Inspection, Testing, Certification and Commissioning:

Commissioning of the dust extract systems shall be carried out in accordance with the procedures, checks and tolerances given in the BSRIA Application Guides for Air Systems to achieve the standards set out in the CIBSE commissioning codes. Preliminary checks and procedures shall be performed as detailed in the CIBSE commissioning codes. The purpose of these checks are to ensure that the system is statically completed, as defined in section B4 of BSRIA 3-89 commissioning of air systems in building.

It should be noted that all ductwork shall be completed before plant is first run using access openings in ductwork.

As part of the inspection, testing and commissioning, a measurement of the ducts input velocity should be taken to check if the equipment installed is achieving the correct amount of air extraction.

Instrument and methods of measurement shall be as detailed in BSRIA application guide, 3-89 and CIBSE commissioning guide section A3. A commissioning sheet will be provided for recording the commissioning results in due course.

57.14 Training and Demonstration:

On completion of the installations a certificate shall be completed to confirm that the systems have been demonstrated to the users and that instruction manuals have been issued to the Client. Each certificate shall be signed and dated by the Client, and the Consulting Engineer.

Usurer shall be provided, prior to demonstration when an operating and maintenance manual, which clearly indicates all aspects of operation and equipment and sets out the procedures for routine maintenance. The manuals shall include contact details for suppliers and replacement parts.

57.15 Commissioning

The Contractor shall be responsible for the starting up of the systems and the setting up and balancing of the air quantities passing through all grilles, ducts and fans provided under this section. He shall produce the following data for system review:

- (a) Total air quantity handled by each fan, duct and grille.
- (b) Running and rated fan speeds.
- (c) Fan running current under design load and rated motor current.
- (d) Fan total pressure under design load.
- (e) Static pressure drop across ductwork systems under design load.
- (f) Noise levels in occupied spaces.

Tabulated results shall be provided for each plant item laid out separately in a format to be agreed by the Engineers so as to demonstrate that the systems are operating correctly and in accordance with the design.

The Contractor shall provide all reasonable assistance to the Engineer including the use of all necessary instruments, ladders, etc., to check the test results provided by the Contractor.

57.16 Testing

The Contractor shall include in his tender for testing all the equipment covered in this section. Testing may, if necessary, be carried out in sections and the Contractor shall be allowed no extra on account of this. Tests shall cover the air tightness of the plant, plenums and all ductwork, the correct operation of all motors, dampers, and any other equipment in this section.

The tests shall also include the adjustment of the air system and its related plant and shall ensure that the air quantity through each grille is as indicated on the schedule.

All balancing and other dampers shall be tested for free movement and correct operation.

The Contractor shall be held responsible for the efficient working of the system (faulty design excluded) and for defects arising from faulty materials and workmanship.

57.17 Labelling

All plant items supplied under this section shall be provided with labels manufactured from ivoring or similar approved plastic and wording to approval. Labels shall measure approximately 150 mm x 100 mm and be affixed to the plant item by C.P. self lapping screws.

57.18 Painting

All exposed metalwork, etc., shall be thoroughly cleaned and painted with one base coat of rust inhibiting paint and two coats of an approved colour finishing paint.

Dunhill EcoPark, Waterford

Specification extract for noise attenuated in line fan

Silent mixed flow in line fan, high aerodynamic performance, low noise, compact design to minimise noise breakout and floor generated noise. Sound attenuated casing of ABS PVC, with minimum of 15mm sound absorbent material. Integrated mounting foot for wall or ceiling mounting. Motor and fan assembly easily demounted from the attenuated casing, with rubber gasket for tight air seal connection.

Terminal box rotatable through 360deg, two speed, speed controllable motor. Insulation class 'b', S1 continuous rated IP44 motor. Maintenance free ball bearings, and motor thermal overload protection in accordance with EN 60335280.0

Dunhill EcoPark, Waterford

Specification Grilles and Diffusers

Grilles and diffusers shall be manufactured from injection moulded engineered polymer. The units are to be self coloured white as standard.

Grilles and diffuser to be class 'o' fire rated.

They must be suitable for use in any air distribution system where air temperatures do not exceed 50°C.

Propriety components and accessories shall be used to promote smooth flow lines, ensuring an exception aerodynamic and acoustic performance.

Dunhill EcoPark, Waterford

Attenuator Specification

Splitter type noise attenuators shall be installed where shown on the drawings and as called up in the specification, to meet the noise criteria levels in the various areas as elsewhere defined. The casings and flanges of the attenuator shall be constructed from high quality pre-galvanised sheet steel, the flanges shall be drilled to facilitate erection on site.

All internal acoustic absorption facings shall be constructed from galvanised sheet steel mesh. Al linings, splitters and pods shall be packed with acoustic absorptive media, of constant density faced with a fibre glass cloth to prevent fibre erosion. Where attenuators are used in kitchen applications, the attenuator acoustic elements should be faced with a non permeable membrane. The changed acoustic performance of the attenuator with this facing must be taken into account to meet the required insertion loss, and to ensure that the specified area noise criteria are met. Attenuator selection must take into account the pressure loss through the airways to ensure that the system resistance does not exceed the stipulated fan performance.