



PROFESSIONAL BUILDING SERVICES & ENERGY REDUCTION CONSULTANTS

DESIGN RISK ASSESSMENT

*Castleknock Community College, Carpenterstown
Road, Castleknock, Dublin 15*

*DoEY Emergency Works Scheme
Heating Centre Upgrade Works*

Mechanical & Electrical Design Risk Assessment

INTRODUCTION

Under the Safety, Health and Welfare at Work (Construction) Regulations 2013 to 2021, the duties of the designer extend to the following:

- Taking account of the Health & Safety Plan and Safety File,
- Providing in writing all relevant information necessary to the Project Supervisor for the Design Process (PSDP), so as the project supervisor can carry out his / her duties as per the regulations,
- Co-operating with other designers, the PSDP and the Project Supervisor for the Construction Stage (PSCS) to enable them to comply with the regulations,
- Providing all information known to the PSDP regarding particular risks to safety, health and welfare of persons at work,
- Identify any hazards that a design may present during the construction stage and subsequent maintenance and where possible eliminate,
- Providing information to the appropriate contractor if no project supervisor has been assigned,

DISCLAIMER

Geaney Engineering Consultants believe reasonable efforts have been made to ensure the accuracy of the information contained in this document. It may include inaccuracies or typographical errors and may be changed or updated without notice. It is intended for discussion and reference purposes only and is provided "AS IS", without warranty of any kind. Reliance on any information presented is at your own risk. Geaney Engineering Consultants hereby disclaims all warranties and conditions with regard to this information. In no event shall Geaney Engineering Consultants be liable for any damages of any form arising out of, or in any way connected with the use of this document. If you are dissatisfied with any portion of this document, your sole and exclusive remedy is to discontinue using this document.

Mechanical & Electrical Design Risk Assessment

PROJECT DESCRIPTION

The site comprises the existing Castleknock Community College, Carpenterstown Road, Castleknock, Dublin 15. The site boundaries are defined on the accompanying drawings, and the Contractor shall confine all operations to the designated work areas. The works comprise the decommissioning, disconnection and removal of the existing boiler plant, associated pumps, pressurisation equipment, flues, controls and ancillary services within the existing boiler room. The project includes the supply, installation, testing and commissioning of a new high-efficiency modular condensing gas boiler plant, new domestic hot water generation system, associated heating distribution pipework modifications, gas services, controls, electrical services, builders works and all associated ancillary works, as indicated on the accompanying drawings and specifications.

The Mechanical Contractor shall carry out the installation to the highest standards using materials and equipment of proven quality, reliability and durability. All works shall be undertaken by suitably qualified and competent personnel with appropriate experience in projects of a similar nature, scale and complexity.

The Contractor shall submit a detailed programme for the execution of the works. As the school will remain operational throughout the contract, the Contractor shall allow for phased working, temporary service interruptions outside normal school operating hours where necessary, and all measures required to maintain the safe operation of the school and minimise disruption to building occupants.

Please refer to the accompanying drawings and specification documents for full details of the proposed works.

Mechanical Services Installation Works

The works comprise the complete replacement and upgrade of the existing heating centre, including associated mechanical, gas, domestic water, controls and electrical services installations, to be carried out under a direct contract with the Client.

General Construction Notes:

The Contractor shall undertake a full review of all relevant information prior to commencing the works, including all drawings, specifications, existing record information and documentation provided by the School. The Contractor shall verify all existing mechanical, electrical, gas and builders services on site and liaise with the Design Team where necessary.

The Contractor shall note that the works are to be carried out within an operational school environment. Particular care shall be taken during the disconnection, demolition and removal of the existing plant to ensure the continued safe operation of the building and to minimise disruption to the school. Temporary service shutdowns shall be carefully planned and agreed with the School Authority in advance, with out-of-hours working allowed for where necessary.

Prior to any disconnection, drilling, demolition or stripping out works, the Contractor shall review the Health & Safety File and the Asbestos Register for the building, where available, and shall implement all necessary control measures. The Contractor shall also verify the location of all existing mechanical, electrical and gas services before commencing the works and protect all services that are to remain operational throughout the duration of the contract.

THE PRINCIPLES OF PREVENTION:

Regulation 15(1) of S.I. No. 291 of 2013 states that all designers must take account of the General Principles of Prevention which are contained in Schedule 3 to the Safety, Health and Welfare at Work Act 2005. They are as follows:

- a) The avoidance of risks.
- b) The evaluation of unavoidable risks.
- c) The combating of risks at source.
- d) The adaptation of work to the individual, especially as regards the design of places of work, the choice of work equipment and the choice of systems of work with a view, in particular to alleviating monotonous work, and work at a predetermined work rate and to reducing their effect on health.
- e) The adaptation of the place of work to technical progress.
- f) The replacement of dangerous articles, substances or systems of work by non-dangerous or less dangerous articles, substances or systems of work.
- g) The development of an adequate prevention policy in relation to safety, health and welfare at work which takes account of technology, organisation of work, working conditions, social factors and the influence of factors related to the working environment.
- h) The giving to collective protective measures priority over individual protective measures.
- i) The giving of appropriate training and instructions to employees.

It should be noted that:

- Only risks that can reasonably be foreseen at design stage can be assessed.
- Risks to those building and to those who might be affected by this work (eg: members of the public) must be considered. Risks during construction, and subsequent maintenance or repairs must be considered.
- Risk assessment may be simple or elaborate depending on the nature of the project and the risk in question. Conventions, generally taken, define a “hazard” as a condition or event with the potential to cause harm, and define a “risk” as the probability (P) that harm from a particular hazard will occur, combined with the likely severity (S) of the harm. $R = S \times P$. Note: it is accepted that this is a very subjective area where good judgement counts more than rigid formulae.
- As the project proceeds, designers need to assess the design and the materials to be used, to establish whether a risk is being introduced and to consider whether this risk can be removed or minimised.

Mechanical & Electrical Design Risk Assessment

RISK ASSESSMENT

A Design Risk Assessment has been completed. The risk ratings and action bands are defined as follows:

Likelihood

L	–	So unlikely that it can be assumed that it may never occur
M	–	Is unlikely but possible to occur during the life of the project
H	–	Is likely to occur during the life of the project

Severity

L	–	All other injuries or illnesses
M	–	3 day injury or illness
H	–	Death or major injury

Risk Rating

L	–	Minimal Risk
M	–	Low Risk
H	–	Immediate Risk

Action Required

L	–	Maintain Control Measures
M	–	Review & Improve Control Measures if necessary
H	–	Improve Control Measures Immediately

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
1.	Works near high voltage power lines or underground services	a) Sever Injury / Death	Electrical Contractors, General Contractors	L	H	H	Full Review of all relevant information required by the Main Contractor, review all drawings and information from Utility Providers, and liaise where necessary			Contractor to comply with the requirements of ESB and H.S.A. "Avoidance of Electrical Hazards when working near underground electric cables". GRP Survey and identification of all services within area of proposed works. Hand Digging in high risk areas where unclear.
2.	Work within attic spaces, ceiling voids, at high level, on roofs, etc.	a) Risk of personnel fall.	Public, General Contractors, Clients and Employees	M	M	M	Inform design / construction teams by issue of this document.			Contractor to co-ordinate all works. Contractor to provide safety signage and barriers where required and immediate area to be restricted from general personnel circulation routes. Any work required at height must have the necessary safety precautions, such as safety harnesses, scaffolds, etc. Use approved personnel mechanical access equipment where possible.
		b) Risk of falling equipment, tools, etc..	Public, General Contractors, Clients and Employees	M	M	M	Inform design / construction teams by issue of this document.			Contractor to co-ordinate all works. Contractor to provide safety signage and barriers where required. Where project work at height is required, area to be appropriately restricted from personnel circulation routes.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
		c) Working within confined space.	General Contractors	M	M	M	Identify as far as is reasonably practicable, any work required within a confined space. Minimise project work required within those confined spaces identified. Inform design / construction teams of possibility of confined spaces by issue of this document.			Contractor to co-ordinate all works. Contractor to provide safety signage and barriers where required. Review all project work to identify the possibility of confined space limitations, discuss potential risks and take measures to reduce risk to all personnel. If in doubt, ask.
3.	Installation of Electrical Services	a) Risk of Musculo-skeletal injuries.	Electrical Contractors, General Contractors	M	M	M	Identify as far as is reasonably practicable, any equipment items / services runs which must be handled as part of the project work, which may be heavy, difficult to handle and/or must be installed in space restricted locations. Inform design / construction teams by issue of this document. Where possible, select new equipment that can be easily installed, thus minimising project work at height, in confined areas, etc.			Allow for the appropriate mechanical handling equipment and personnel access equipment to be utilised where possible. Schedule access to the project work areas in advance and allow sufficient time / manpower to complete the works. Complete frequent “Toolbox Talks” with contract personnel during the course of the project work.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

Page 7

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
		b) Risk of falling equipment, tools, etc..	Public, General Contractors, Clients and Employees	M	M	M	Inform design / construction teams by issue of this document.			Contractor to co-ordinate all works. Contractor to provide safety signage and barriers where required. Where project work at height is required, area to be appropriately restricted from personnel circulation routes.
		c) Risk of electric shock, Risk of fire	Electrical Contractors, General Contractors	M	H	H	Communicate to construction teams by way of this document that all circuits must be isolated before project work can commence on same.			Identify electrical circuits prior to work and test to ensure that they are isolated. Contractor to carry out audit to identify any electrical risks prior to carrying out project work. Use safety signage and correct work wear as deemed appropriate.
4.	Is there a risk of crushing electrical equipment during the project works?	a) Risk of contact with electrical cables.	Electrical Contractors	M	M	M	Identify electrical equipment within the vicinity of the works and determine if same can be / needs to be isolated to facilitate the project work. Inform contractor by way of issue of this document.			Identify any equipment whereby project work may pose a risk to same. Provide for the use of appropriate signage. Take the necessary precautions to eliminate risk to contract personnel during the course of the project work.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
5.	a) Boiler / burner installation, heating System modification	a) Risk of Musculo-skeletal injuries as a result of heavy equipment and risk of same equipment falling.	General contractors	L	M	M	Specify equipment of modular or sectioned components. Where possible, position equipment so that it can be readily installed, minimising the need for lifting gear. In turn, position equipment so that it can be readily maintained.			Where possible, allow for mechanical handling equipment to be utilised. Install component ASAP during the construction phase to allow the best possible levels of access, and then protect while construction occurs around it.
		b) Risk of hot surfaces during commissioning activities.	General contractors	M	M	M	Specify equipment to have thermal insulation to protect against accidental burns from contact with hot surfaces. Allow for adequate labelling within the area.			Ensure that contractor personnel are protected from hot surfaces.
		c) Risk of pipe / plant fluid leaks during commissioning activities.	General contractors	M	M	M	Specify during commissioning that the system is checked for leaks. Review the use of a hydrostatic pressure test prior to equipment start up.			Ensure personnel within range of pipework and plant equipment are aware of the risks involved.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

Page 9

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants						Project: Castleknock Community College – Heating Centre Upgrade Works				
Project No. 0835						Date: 25/06/2025				
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
		d) Line breaks	General Contractors	L	M	M	Minimise the number of live piping breaks required. Specify breaks to pipes where the system can be drained down prior to breaking. If not possible, look at specifying tie ins close to block valves on the same piping.			Make hazards known to construction teams by issue of this document.
6.	a) Pumps and associated control gear installation – Heating Centre	a) Risk of Musculo-skeletal injuries as a result of badly positioned equipment.	General contractors	M	L	M	Consider final equipment positions before installation. Locate equipment to accessible areas, which do not present a hazard to personnel working / undertaking maintenance within the area. Specify hazardous labels where deemed necessary.			Ensure personnel working within range of the pipework and plant equipment are aware of all possible risks. Review the work area prior to starting.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
7.	Commissioning	a) Risk of electric shock.	Public, General Contractors, and Clients Employees	L	M	M	Inform design / construction teams by issue of this document			Contractor to carry out audit and to take responsibility to identify any electrical risks prior to carrying out any commissioning works. Method statement and safety procedures to be issued. Competent electrician to connect with qualified personnel in attendance.
		b) Rotating Machinery	General Contractors, and Clients Employees	L	M	M	Correct safety guards (if applicable) to be specified.			Make hazards known to construction teams.
		c) Risk of hot surfaces during commissioning activities.	General contractors	M	M	M	Specify equipment to have thermal insulation to protect against accidental burns from contact with hot surfaces. Allow for adequate labelling within the area.			Ensure that contract personnel are protected from hot surfaces. Ensure that appropriate safety equipment, such as lagging, has been installed correctly.
		d) Risk of pipe / plant fluid leaks during commissioning activities.	General contractors	M	M	M	Specify during commissioning that the system is checked for leaks. Review the use of a hydrostatic pressure test prior to equipment start up.			Ensure personnel within the vicinity and those working on the system are aware of the risks involved.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
		e) Line breaks	General Contractors	L	M	M	Minimise the number of live piping breaks required. Specify breaks to pipes where the system can be drained down prior to breaking. If not possible, look at specifying tie ins close to block valves on the same piping.			Make hazards known to construction teams by way of issue of this document.
8.	External Groundwork	a) Contact with existing underground live electrical services	General Contractors	M	H	H	Inform construction teams by issue of this document.			Make all known service routes knowledgeable to all affected. Contractor to scan area thoroughly for live electrical services before opening ground.
		b) Contact with existing mechanical services pipework	General Contractors	M	M	M	Inform construction teams by issue of this document.			Make all known service routes knowledgeable to all affected. Use caution when opening ground.
		c) Risk of cave-in, or collapse of a trench?	General Contractors	L	M	M	Inform construction teams by issue of this document.			Where large excavations are required, identify this risk and take the necessary steps to avoid an accident.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants						Project: Castleknock Community College – Heating Centre Upgrade Works				
Project No. 0835						Date: 25/06/2025				
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
9.	Gas Installation	a) Risk of gas/liquid leaks b) Risk of injury	General Contractors Mechanical Contractors	L	H	H	Interruption of existing gas services in-situ. Liaise with gas suppliers to ensure supplies infrastructure are identified. Minimum distances to be provided for and maintained at all times. Provide as much record information as possible to contract firms undertaking the works. The design specification and drawings issued in line with codes and standards with the necessary natural gas safety features incorporated.			The contractor shall take every care not to damage/interrupt any existing services. The contractor should ensure that all personnel are fully aware of the configuration of the system they are working on and any other system they are likely to come into contact with. Ensure all excavations are carried out in accordance with the H.S.A Code of Practise: Avoiding Danger from Underground Services. i.e. use of maps/records, identification of pipe locations & safe digging practises. Plant must be fitted with adequate safety and monitoring control devices and operated by competent persons.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)

DESIGNER'S RISK ASSESSMENT

Designer: Geaney Engineering Consultants							Project: Castleknock Community College – Heating Centre Upgrade Works			
Project No. 0835							Date: 25/06/2025			
Ref. No.	Activity / Element	Potential Hazards	Population at Risk	Risk Rating			Action at Design Stage	Action Taken		Possible Control Measures (Contractors)
				L	S	R		By	Date	
10.	Covid-19	Risk of contamination / infection	General Contractors	H	M	M	The contractor must comply with all safety measures, protocols and guidance for construction sites from the Department of Health in relation to Covid 19. Implement social distancing, cleaning, appropriate PPE and training. Allow for adequate duration for works construction			Ensure that all contractors personnel are aware of their responsibilities in this regard, and have the relevant PPE, and comply with all safety and guidance measures in accordance with HSA and CIF.

Key:

L = Likelihood (Low, Medium, High)

S = Severity (Low, Medium, High)

R = Risk (Likelihood & Severity)