



**TECHNICAL GUIDANCE DOCUMENT  
TGD-020**

**GENERAL DESIGN  
GUIDELINES FOR SCHOOLS  
(PRIMARY & POST PRIMARY)**

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# 1. INTRODUCTION

## 1.1 BACKGROUND TO THE LATEST REVISION

- (a) The Department of Education and Skills (DoES) has an ongoing policy of updating its suite of Technical Guidance Documents (TGDs) for primary and post primary schools with a view to improving the design and functionality of school buildings and providing updated guidance to school authorities and Design Teams.
- (b) Since the introduction of this guidance document in August 2007 a number of new and/or updated TGDs have been published by the DoES and this guidance document has been revised to reflect their implications.
- (c) The latest revisions are *highlighted in red* in this document. Where an entire section is new only the **headings** are in red text.

## 1.2 PURPOSE

- (a) This document comprises general Design Guidelines that state the general principles to be used in the design of Primary and Post-primary schools with the objective of achieving design quality, facilitating timely completion of buildings that represent value for money, and which can be effectively, efficiently and economically managed through their life cycle.
- (b) This document, in conjunction with other relevant design guidance, is intended both as a design tool-kit for the School Authority (i.e. the Client)\* and the Design Team and as part of a set of reference documents for the evaluation of design submissions.
- (c) The Suite of Design Guidance documents is intended to assist in the design and proper planning of buildings in response to the educational needs of a particular school as determined in the brief formulation process.

*\* In the case of Community and Comprehensive Schools and some Primary Schools the Minister for Education and Skills is the Client, but for the purposes of this document the term School Authority is used to encompass the client and the school management authorities.*

## 1.3 DESIGN GUIDANCE SUITE

- (a) The General Design Guidelines for Schools (Primary and Post-primary) is part of a suite of Department of Education and Skills (DoES) design guidance documents for Primary and Post-primary schools which is available on the DoES website at [www.education.ie](http://www.education.ie) under **"School Building and Design"**.
- (b) These Guidelines and the other relevant documents in the Design Guidance suite should be read in conjunction with

- The **Brief**,
- The current [DoES Design Team Procedures \(DTP\)](#) and
- All other [DoES Technical Guidance Documents \(TGDs\)](#) published on the DoES web-site.
- **Current Department of Housing Planning and Local Government (DoHPLG) Building Regulations and associated Technical Guidance Documents (herein after referred to as "the Building Regulations")**.

*Always check the Department's website for the most up-to-date versions of DoES documents.*

- (c) In applying these guidelines to projects, School Authorities and Design Teams will be obliged to comply in full with the DoES Design Team Procedures, DoES TGDs and other guidance issued by the DoES, except as stated in SECTION 1.5 APPLICATION herein.

## 1.4 DESIGN TEAM PROCEDURES

- (a) The [Design Team Procedures](#) (DTPs) set out the scope of service for all Design Team members individually and collectively for all projects stating the requirements and principles for each stage of the design and construction process starting with Preliminary Design, and proceeding through the design stages to Tender Documents, Invitation of Tenders, Construction and Final Account.
- (b) The DoES DTPs apply to all construction projects funded in part or in total by the DoES unless otherwise directed by the DoES in writing.

## 1.5 APPLICATION

- (a) These guidelines on school design (Primary and Post-primary) apply to all primary and post-primary construction projects funded in part or in total by the DoES (unless otherwise directed by the DoES in writing) where a decision to commence architectural design and planning has been confirmed in writing by the DoES Planning and Building Unit (PBU).
- (b) Where specialist accommodation for pupils with special educational needs is included as part of the accommodation brief, guidance and advice can be found in DoES TGD026, Primary & Post Primary School Specialist Accommodation for Pupils with Special Educational Needs.
- (c) In the case of Special Schools, additional guidance and direction should be sought from the DoES PBU, and some of the guidance in this document **and in TGD026** will not be applicable.
- (d) The scope of the building project will be the [Schedule\(s\) of Accommodation](#) and other briefing instructions as agreed between the School Authority and the DoES PBU.
- (e) Where it is proposed to construct a new school *or an extension to an existing school* these guidelines and all associated documents in the suite of DoES design guidance should be applied in full.
- (f) In the case of existing school buildings, where an extension, conversion or renovation is proposed, a flexible pragmatic approach will be required. The dimensions and areas stated in the [DoES TGD-022 PRIMARY SCHOOL DESIGN GUIDELINES](#), [TGD-023 POST-PRIMARY SCHOOL DESIGN GUIDELINES](#), and the [Primary Room and Post-primary Room Layouts](#) will apply in full to the new build portion of the project.
- (g) The dimensions and room areas in the existing building will be retained except where the PBU specifies otherwise (based on educational need). In existing buildings the room designation, dimensions, and areas will be as specified in the brief ([Future Use of Existing Accommodation](#)) except where otherwise indicated.
- (h) **Where reference is made herein to other technical documents, whether DoES documents or documents published by others, the most up to date versions available shall be used for reference.**
- (i) **Any Standards or Acts quoted are current at the time of writing: the prevailing versions of these shall be used at the time of design and installation**

## 1.6 FURTHER INFORMATION

- (a) This document and all other Guidance Documents mentioned above are available on the DoES website at [www.education.ie](http://www.education.ie).

*Always check the DoES website for the most up to date versions.*

- (b) For further advice on these guidelines or any other matters relating to this document, please contact:

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## 2. PROJECT BRIEF

### 2.1 BRIEF

- (a) Each project will have an agreed written Brief setting out the scope of works and the School Authority's requirements for that project. Every brief will comprise (where applicable):
  - (i) A [Schedule of Overall Accommodation](#)
  - (ii) A [Schedule of Future Use of Existing Accommodation](#) (with room areas)
  - (iii) A [Schedule of Residual Accommodation](#) (new build extensions to existing)
  - (iv) A [Schedule of Alterations to Existing Accommodation](#), where necessary for the implementation of that project only (if required)
  - (v) A Provisional [Schedule of Essential Remedial Works](#) applicable to that project only (see also Design Team Procedures)
  - (vi) A [Cost Limit for New Build](#) per square metre (if applicable).
- (b) In all cases the determination of the brief will be based on an assessment of overall medium-to-long term educational need, and the capacity and suitability of existing accommodation, and the site, to provide for this need.
- (c) For Primary and Post-primary School projects, this brief is determined by the *DoES* Schools Capital Appraisal Section (SCAS) of the PBU, in agreement with the relevant School Authority as follows:
  - (i) SCAS first determines the projected long-term enrolment for the school.
  - (ii) Then based on the current design guidelines, Educational Worksheets (Post-primary Schools only), staffing levels, and current area norms, SCAS determines a [Schedule of Overall Accommodation](#).
  - (iii) The PBU then assesses the Educational Suitability of the existing accommodation and prepares both a [Schedule of Future Use of Existing Accommodation](#) and a provisional [Schedule of Alterations & Remedial works](#) (if applicable).
  - (iv) The deficit in accommodation, i.e. the difference between the [Schedule of Overall Accommodation](#) and the [Schedule of Future Use of Existing Accommodation](#), is called the [Schedule of Residual Accommodation](#) and the total area indicated is the Total Floor Area (area limit) of new build to be funded.
  - (v) In the case of post-primary schools the above schedules will have already been issued to the school authority for comments/ acceptance leading to agreed schedule/s between the School Authority and SCAS.
  - (vi) [Schedule of Residual Accommodation](#) plus [Future Use of Existing Accommodation](#), plus the [Provisional Schedule of Alterations & Remedial Works](#) (if applicable) and the applicable [Cost Limit](#) all form part of the brief for the project.
- (d) The Project Brief setting out the scope of works must be agreed in writing by both the school authority and DoES PBU before the appointment of the Design Team, and before commencement of [Stage 1 Preliminary Design](#).

## 3. DESIGN PHILOSOPHY

### 3.1 DESIGN AIMS

- (a) The school should be lively and welcoming; a suitable place for intellectual, creative, physical and social activity **and inclusion**; a place that the students will make their own with an atmosphere and sense of scale that is not over-powering, or impersonal. The design should help to provide a stimulus for the school's curricular and extra-curricular activities.
- (b) The planning of the building should not be seen merely as the assembly of a series of teaching and non-teaching spaces but as a complex of spaces permitting the optimum degree of variety in use. The design should take into consideration the need for flexibility during the daytime and evening. It should facilitate effective and unobtrusive supervision of all indoor and outdoor activities.
- (c) The proposed new school or extension to an existing school should create an effective filter between its occupants and the external environment and should be designed to a high standard of physical and environmental performance combined with economy and efficiency of means and should lead to a balanced distribution of elemental costs within the overall cost target.
- (d) Although each individual design will vary due to the specific site context, the Design Team's primary aim must be to provide the quality and character of environment appropriate to the educational aims, philosophy and the ethos of the school.

### 3.2 DESIGN STRATEGY

- (a) All members of the Design Team must contribute towards a common and comprehensive view of the long and short-term needs of the school. All must agree at project inception to the integration of the design factors for which they might normally be individually and separately responsible.
- (b) The execution of different functions of the Design Team members shall be integrated, combining Architectural Design, Building Services Engineering, Civil/Structural Engineering and Quantity Surveying Services (and in exceptional circumstances other consultants as may be appointed from time to time by the client with the PBU's approval) to create a safe, well designed, sustainable, cost effective, durable low maintenance building.
- (c) From the very beginning of the design process all members of the Design Team must design with Health & Safety uppermost in their minds, both during construction and in use. The design shall allow for repair or replacement of components of the building such as fittings, finishes and services with minimum disruption and cost.
- (d) The Design Team members are required to consider life cycle costs at the earliest stage of the Design Process. Life cycle costs are best achieved by an even balancing of the budget over all the building elements. Refer also to DoES TGDs for Building Services and Construction Standards.
- (e) To achieve the above it is essential that all disciplines within the Design Team work together from the beginning of the project and that the design is developed through collaboration by all of the Design Team members.

### 3.3 DESIGN CRITERIA

- (a) Opinions on what constitutes good design can be subjective. However, many of the issues can be assessed objectively, such as whether the building will function efficiently and effectively; whether there is clear evidence of thoughtful and imaginative proposals that will deliver a high quality teaching environment; and whether the materials, construction methods and proposed layout will contribute to a durable low maintenance building.
- (b) The design process can therefore be structured around a number of key components. These guidelines and the suite of DoES Design Guidance Documents for primary and post-primary

schools deal with a number of these components, and the standard which needs to be achieved in developing a school design including:

- How the design supports the activities of its users
- How a building functions and fits in with its environment
- Building's character and form
- Access, circulation and way-finding
- How the design supports and underpins the principles of Universal Design and Inclusion
- Efficiency and flexibility of the layout
- Capacity for expansion
- Health & Safety
- Building quality and durability
- Structural integrity
- Security
- Energy efficiency and use
- Mechanical & Electrical Building Services Engineering (including how the Building Services support teaching and learning in a seamless and intuitive manner)
- Sustainability
- External layout and landscaping

## 3.4 ARCHITECTURAL DESIGN

### 3.4.1 DESIGN COMPOSITION

- (a) The design of a school should reflect a clear and strong architectural concept underpinning the form and character of the building, and how spaces relate to each other. The building should be a civic building to reflect the importance of the school in the community.
- (b) The whole school should have a harmonious and consistent identity while allowing individual parts to vary to suit their use. All building and service elements, which are visible, should be fully considered at the design stage, and not insensitively applied later. Consideration should be given to how the building and spaces between the adjacent buildings will look both during daytime and at night.
- (c) The Design Team may consider innovative ways to achieve the functional requirement and design philosophy. Alternative design strategies should be fully considered against all the other design criteria to ensure that they meet all the requirements of this document.
- (d) Features which enhance students understanding of how buildings work may be considered as well as provision for the display of pupil's/student's artwork in the design of spaces. The use of the design and construction process as a teaching vehicle should be facilitated by the design and built form.
- (e) The design of a school should support and underpin the principles of Universal Design and Inclusion.

### 3.4.2 SPATIAL QUALITY

- (a) The design should place an emphasis on the spatial quality and variety of the entire building and each component part. The design should create spaces to raise the spirits rather than depress them. The scale and proportion should be appropriate to the users. The scale should not feel intimidating to pupils/students. Consideration may be given to expressing functional spaces in the school as visual elements to break up the massing of the school (e.g. grouping rooms of similar scale size and heights).

- (b) Consideration should be given to how light and shade will enhance the three-dimensional built form. Monotonous forms should be avoided. The design should be consistent with the creative activities taught with attractive features at key points.
- (c) Spaces should be planned as appropriate to their use and should be bright and stimulating or calm and relaxing as appropriate.
- (d) Special care should be taken while selecting the colour scheme. Complex colour schemes and the use of contrasting colours (e.g. red/green) that could create a difficulty to the visually impaired should be avoided.
- (e) The proposed school design should ensure that all areas are fully accessible by all users. See [SECTION 8.0 UNIVERSAL ACCESS](#) herein.
- (f) Special needs of pupils/students and adults with disability and additional support needs in classroom and social areas should be considered in the initial design stage to ensure (in a discrete manner) a safe and secure environment for pupils/students and staff. In the case of Special Schools and/or provision for special needs children, additional guidance and direction should be sought from the PBU.
- (g) All teaching areas (with the exception of **the Multi-use Hall in post primary schools**), together with administration offices and habitable rooms, should have a horizontal vista (bottom of window not higher than seated eye level) and a view of the outside environment. Window sill heights should normally be at a minimum of 700mm above finished floor level in primary schools and 900 mm above finished floor level in post primary schools. Window head heights for teaching spaces should be a minimum of 2400mm above finished floor level for the main windows to maximise daylight penetration.

### 3.5 STRUCTURAL DESIGN

- (a) Considerations should be given to the “buildability” of schools (i.e. simplicity and economy of construction). Innovative forms or methods of construction may be considered, but the Design Team must ensure that the end product works and is suitable for use in schools.
- (b) Structural schemes used should have flexibility with regard to future use, change of function of rooms, and so far as is practicable upgrading to meet higher standards of air tightness and thermal or acoustic insulation.
- (c) It should be possible to safely undertake maintenance work and to repair or replace components of the building such as fittings, finishes and services with minimum disruption and cost when necessary. This is best achieved by all disciplines within the Design Team working together from the beginning of the project so that the design is a result of collaboration by all the Design Team members. Refer also to [DoES TGD-021 CONSTRUCTION STANDARDS FOR SCHOOLS](#).

### 3.6 SUSTAINABILITY

- (a) The design should be developed on environmentally friendly and ecologically sound principles with genuine commitment to sustainability issues which conserve use of energy, water and other resources.
- (b) The use of passive energy measures to achieve a comfortable internal environment shall be employed where possible. Refer to [SECTION 4.4 PASSIVE ENERGY MEASURES](#) herein. The design should also utilise the natural characteristics of the site including orientation.
- (c) The design of the building and the school grounds should promote bio-diversity; and materials used should, where possible, be non-toxic and non-polluting from certified sustainable sources.

### 3.7 MECHANICAL BUILDING SERVICES ENGINEERING PHILOSOPHY

- (a) The Mechanical Building Services Engineering installation comprises heating, **mechanical extract ventilation (including dust extraction)**, water, **rainwater harvesting**, soils and wastes, and fire protection services. The design of the Mechanical Services must take into account

the site microclimate, the building form and orientation of spaces, the thermal performance characteristics of the building, the occupancy trends and restrictions on pollutant emissions.

- (b) The Mechanical Services Design Philosophy and further detailed Mechanical Services Design guidance are described in DoES TGDs for Mechanical & Electrical Building Services Engineering, as published on the DoES website.

### **3.8 ELECTRICAL BUILDING SERVICES ENGINEERING PHILOSOPHY**

- (a) The Electrical Building Services Engineering installation comprises electrical supply, Electricity Centre and main distribution, power distribution services, lighting services, **information & communications technology (ICT) systems**, communication services, transport services and protective services.
- (b) The Electrical Services Design Philosophy and further detailed Electrical Services Design guidance is described in DoES TGDs for Mechanical & Electrical Building Services Engineering, as published on the DoES website.

## 4. THE BUILT ENVIRONMENT

### 4.1 GENERAL

- (a) Detailed requirements for most elements of the Built Environment are described in DoES TGDs for Mechanical & Electrical Building Services Engineering. Further information on air-tightness is provided in DoES TGD-021 Construction Standards for Schools.
- (b) These documents should be read in conjunction with this guidance note and all other relevant guidance in the DoES Design Guidance suite.

### 4.2 ENERGY EFFICIENCY

- (a) An integrated design approach should provide opportunities for energy efficiency. The Design Team should be aware that energy efficiency strategies can support each other or can conflict and thus individual measures should not be considered in isolation.
- (b) The issues to be reviewed by the Design Team should include site, plan form, orientation, passive ventilation, **overheating** and passive solar strategies, and daylighting

### 4.3 THERMAL PERFORMANCE

- (a) Thermal insulation standards shall meet or exceed the Building Regulation standards, but shall also be considered in the context of the balance of heat loss and gain so as to minimise the running costs and maintain comfort conditions.
- (b) The overall building design should ensure compliance with current energy standards and EU directives and should ensure that the building will meet or exceed defined energy targets. See also [SECTION 4.8 AIR TIGHTNESS](#) herein.

### 4.4 PASSIVE AND ACTIVE ENERGY MEASURES

- (a) The use of passive energy measures to achieve a comfortable internal environment should be employed where possible. The form of the building should be developed to take account of the need to minimise energy consumption with particular emphasis on maximising the use of natural ventilation and daylighting and minimising heat losses while maintaining comfort conditions. **Refer to the Energy in Education website [www.energyineducation.ie](http://www.energyineducation.ie) for further guidance.**
- (b) **Where necessary and in order to satisfy future energy targets, active technologies may need consideration. The extent and type of systems will be determined by prevalent and anticipated building performance energy targets, cost, reliability and maintenance requirements.**

### 4.5 NATURAL VENTILATION AND OVERHEATING

- (a) **From a natural ventilation point of view all spaces other than storerooms, toilet areas, corridors and similar spaces not continuously occupied in schools shall be deemed teaching spaces.**
- (b) **Good quality ventilation is critical to the functioning of a teaching space. When not adequately provided it results in a teaching space that is stuffy, overheating and not fit for purpose. Inadequate provision of natural ventilation cannot easily be rectified after a project is completed.**
- (c) **Problems due to inadequate ventilation problems that materialise when the finished building is occupied will be a matter for the Design Team to address in full with the school.**
- (d) **It is the joint responsibility of the Architect and Building Services Consulting Engineer as members of the Design Team to ensure that the window design meets the requirements of the room function.**

- (e) Ventilation where possible should be natural ventilation by means of controllable permanent wall vents (**hit & miss type vents are not permitted**) and windows with opening sections. **Permavents in windows are only permitted where there is no space for wall vents.** In determining the way in which a room is ventilated the Design Team should also consider performance and comfort levels, acoustic factors, safety, ease of operation and maintenance factors along with running costs.
- (f) **For the purpose of compliance with the Building Regulations with respect to purge ventilation, the calculation shall be based on Part F – Ventilation. The ventilation area provided through permanent vents and opening sashes shall exceed the Building Regulations, Part F, Ventilation guidelines, and shall be designed to suit the teaching environment having regard to the high levels of occupancy generally.**
- (g) **Window design must ensure that adequate natural ventilation is provided without draughts. The optimum working solution will require window openings at both high and low level located at suitable intervals and spread evenly across the full structural width of the window plane. Positioning high level openings in a different location to the low level openings or positioning both high level and low level openings at one end of the window plane will lead to poor air quality/hot spots in rooms. The operation of the upper sections must be independent of the lower opening sections. Full height side hung opening sections are to be avoided. Refer also to DoES TGDs for Mechanical & Electrical Building Services Engineering, in particular sections dealing with Natural Ventilation, Overheating and Daylighting for further information on window design in schools.**
- (h) **The final window design should ensure that a minimum ventilation rate of 8 litres per second per pupil is provided in the space. This rate will probably need to be higher to achieve the objectives outlined above and to prevent overheating in the space. The resultant dry bulb temperature shall not exceed 25°C for more than 5% of the school year in all habitable rooms and teaching spaces. This must be viewed as an absolute maximum. It is obvious that a design achieving significantly less than the absolute maximum hours will present a more comfortable internal environment for the occupants. Design Team members should always endeavour to maximise the thermal comfort potential in their design. The following table represents the typical calculation scenarios at Primary and Post Primary schools.**

<b>School Type</b>	<b>No of teaching days per annum</b>	<b>Typical full school day</b>	<b>Number of teaching hours per annum</b>	<b>Absolute maximum hours per annum not to exceed 25°C</b>
<b>Primary</b>	183	5 hours 40 minutes	1037	51.85 hours
<b>Post Primary</b>	167	6 hours 40 minutes	1114	55.70 hours

- (i) The effect of restrictors on the installed window opening area must be considered at design stage to ensure adequate ventilation as outlined above.
- (j) Where room depths of over 7.0 m are unavoidable special consideration should be given to ensure adequate natural ventilation throughout the useable room area. Refer also to [SECTION 4.6 NATURAL DAYLIGHT](#) herein.
- (k) Where feasible toilets should be located on external walls and incorporate openable windows. Ventilation shall be as outlined in DoES TGDs - GUIDELINES AND STANDARDS FOR SANITARY FACILITIES IN PRIMARY SCHOOLS, and GUIDELINES AND STANDARDS FOR SANITARY FACILITIES IN POST-PRIMARY SCHOOLS. All internal toilets shall be mechanically ventilated.
- (l) **Where feasible Changing Rooms shall be located on external walls and incorporate openable windows. Mechanical extract ventilation shall not be provided in these areas.**

## 4.6 INTERNAL AIR QUALITY (RADON AND OTHER GASES)

### 4.6.1 RADON MITIGATION

- (a) Radon gas is a carcinogenic environmental hazard. Outdoors, radon is diluted to very low levels. However, radon can enter into a school from the ground through small cracks in floors and through gaps around pipes or cables. Over a long period, exposure to Radon can increase the risk of developing lung cancer. The only way to know how much Radon is in a school is to take a Radon test. There is no safe limit, or safe concentration level of Radon gas. Nevertheless, in line with European Council Directive 2013/59/EURATOM of 5 December 2013, and European Basic Safety Standards (BSS), one Irish government department, the Department of Communications, Climate Action and Environment (DCCA) sets the National Reference Level (NRL) for long-term exposure radon levels in workplaces at an annual average of 300 Becquerel per cubic metre, or 300Bq/m<sup>3</sup>. Another Irish ministry, the Department of Housing, Planning and Local Government (DHPLG) sets the National Reference Level (NRL) for long-term exposure to Radon in dwellings at 200 Becquerel per cubic metre, or 200Bq/m<sup>3</sup>. NRLs are Action Levels; action must be taken to mitigate/lower levels to below the Action Level.
- (b) While schools are workplaces, the predominance of young occupants puts them in a special category. Consequently, the DoES has adopted the more stringent dwellings NRL of 200Bq/m<sup>3</sup>. The Action Level for all schools is 200Bq/m<sup>3</sup>.
- (c) Levels can only be determined by testing, after construction. Nevertheless, mitigation is tackled at various stages: Design-stage preventative measures; post-construction testing/measurement, and if necessary, remedial action measures; and second/re-testing; and if necessary, further, more extreme remedial action.
- (d) Preventative measures are incorporated in the design, and during the construction of school buildings, which will significantly reduce the risk of Radon concentrations. These measures will also provide a potential means of remediation should Radon testing show concentrations that exceed 200Bq/m<sup>3</sup> when the building is in use.
- (e) The same levels of preventative measures are implemented in all schools irrespective of whether the location is an area of high-risk, or low-risk, as identified on the Environmental Protection Agency (EPA) Radon Risk Map.
- (f) The preventative measures include a certified Radon-proof membrane under the entire ground floor area in conjunction with under-slab depressurisation. The ground beneath the entire building is depressurised with a system of Passive Underfloor Radon Sumps connected to sealed pipework that terminates externally above eaves level. Multiple sumps can be networked to a single terminal pipe. All sumps will be passive sumps, and capable of being activated by the addition of appropriate mechanical fan(s) on a timer. Controllable room ventilation must also be assessed and managed to mitigate Radon build-up. (Note: this impermeable membrane and passive sump approach will satisfy risk from other ground gases, see 4.6.2).
- (g) Measurement Testing must be carried out after the building is occupied, in the first year, during the defects liability period of the main contract, and done over a period of three continuous months (preferably the winter months of November, December, January and February). Radon gas is heavier than air, and therefore it is not normally a problem in upper stories. Upper floors, which are not in direct contact with the ground do not need to be tested. All ground floor (and below ground floor) habitable spaces must be tested. Habitable spaces include all rooms and corridors where people congregate or occupy; stores and toilets are excluded.
- (h) The testing and measurement must be done in accordance with the measurement protocols issued by the EPA and carried out by a registered Radon measurement service. The procedure is placing Alpha track etch detectors (Radon Detectors) in each space for the three months, followed by dispatching the detectors to the registered service provider for laboratory measurement and certified results.

- (i) The main works contractor is responsible for arranging this testing/measurement/certified results. The costs for testing/measurement are included in the main works contract. The certified results must be submitted to the school and the DoES (Devolved Projects Section, Department of Education & Skills, Tullamore, Co Offaly, R35 Y2N5). The test results must also be available to the main contractor and Design Team.
- (j) The Design Team must report on the testing, and on the certified results, and recommend follow-up remedial action, if required. Remedial action, if required must be programmed into the contract, and executed before expiry of the defects liability period. Ideally, the follow-up, second testing would also be completed within this period.
- (k) Remedial Action Measures are required where certified test results for ground floor (and below ground floor) spaces exceed 200Bq/m<sup>3</sup>. Remedial action measures can be activated at low cost and with little disruption by the addition of appropriate mechanical timer controlled fan(s).
- (l) The main contractor must ensure the implementation of remediation measures are carried out during the works contract defects liability period, along with commencing the ensuing course of re-testing, and reporting. The Design Team, as part of their normal service contract, must oversee and certify these works for payment. The design team must certify the remedial work as properly installed.
- (m) The Design Team must certify the preventative measures and the remedial works as properly installed.
- (n) Importantly, post-remediation measurements will be required to confirm that remedial work has been successful, and to identify those schools where high radon levels have not, or cannot be reduced. Schools where radon levels remain above the National Reference Level (NRL) of 200Bq/m<sup>3</sup> will be required to notify the EPA, and to put in place appropriate on-going measures to protect occupants with the agreement of the Department of Education and Skills. These might include positive pressurisation.

#### **4.6.2 MITIGATION OF OTHER GROUND GASES**

- (a) Guidance for design and construction of buildings on, or near sites containing landfill is provided in the publication “Protection of New Buildings and Occupants from Landfill Gas” (former Department of the Environment).
- (b) Undisturbed grassland, virgin sites are increasingly uncommon for new schools. Consequently, new schools, and extensions are frequently constructed on disturbed ground where organic material and other contaminants can be found below the building zone. Decaying matter generates nuisance ground gases (Sulphur dioxide, Carbon dioxide, Carbon monoxide, and Methane). Often, it is disproportionately expensive to excavate/remove all offending clay/material; and a more practical proposition is to take the same measures as for Radon, by incorporating passive sumps and full-floor impermeable membrane.

#### **4.6.3 RELEASE OF GASES FROM BUILDING MATERIALS**

- (a) Volatile Organic Compounds (VOCs) can be a cause of indoor air pollution in buildings. There is a wide range of organic compounds ranging from very volatile compounds such as formaldehyde to semi-volatile compounds such as phthalate plasticisers. VOCs can present a risk to the health and comfort of occupants if concentrations in air exceed those known to cause adverse effects. Some are known to be toxic and can adversely affect building occupants, especially children, and particularly those in vulnerable groups (for example, those that suffer asthma and allergies). Odour generated by VOCs can also be a concern to the occupants.
- (b) VOCs can be released from a wide range of construction, furnishing and consumer products used indoors (for example, sheet materials such as MDF, surface finishes and paints, adhesives, materials used in fitted and loose furniture, cleaning products).
- (c) The Design Team should ensure that materials specified comply with the highest standards with regard to the release of VOCs.

## 4.7 NATURAL DAYLIGHT

- (a) All teaching spaces and habitable rooms should have natural daylight as the principal source of light. Artificial lighting shall be used to supplement the available daylight in accordance with standards detailed in this and in the suite of DoES [TECHNICAL GUIDANCE DOCUMENTS](#).
- (b) Daylight calculations are primarily in the remit of the Building Services Consultant Engineer in consultation with the Architect.
- (c) The geometry and distribution of glazed areas shall be carefully designed to provide a high level of natural light while avoiding glare and ensuring a good quality day-lighting distribution in the room. **Refer to DoES TGDs for Mechanical and Electrical Building Services Engineering for the current minimum average day-light factors for primary and post primary schools and for further information on daylighting in schools.**
- (d) When calculating the average daylight factor, the actual task area of the room shall be considered, not the total area; therefore areas such as storage areas, associated circulation space, computer areas and wet areas if recessed behind classroom stores may be excluded. The design calculations should take into account window overhang and use an overcast sky. The use of solid panes in the window geometry is to be avoided unless the above standards can be achieved.
- (e) Windows in Computer Rooms shall be designed as “wide and low” rather than “narrow and high” to minimise the area of bright, visible sky.
- (f) For more information on window geometry see [SECTION 3.4 ARCHITECTURAL DESIGN](#) herein.

### 4.7.2 BLINDS

- (a) **Blinds are included as part of the building contract. Blinds are not required in all teaching spaces in post primary schools. In general Blinds are required in all teaching spaces in primary schools and in some ancillary spaces.**
- (b) **It is the responsibility of the Design Team Architect to liaise with the school authority at an early stage in the design process for a new school or extension to an existing school building and identify the primary and post primary teaching and ancillary spaces where blinds are required.**
- (c) **Refer to DoES TGDs for Mechanical and Electrical Building Services Engineering for further information on the provision of blinds in primary and post primary in schools.**

## 4.8 ACOUSTIC PERFORMANCE

- (a) **Acoustic performance shall comply with the Building Regulations and DoES TGD 021.5 Acoustic Performance in schools.**
- (b) Acoustic performance is a primary determinant of a quality learning environment and the design should be capable of meeting or exceeding the required performance levels.
- (c) **Reverberation times for all teaching spaces shall be in accordance with TGD-021.5 and shall provide for (a) clear communication for speech between teacher and student, and between students, in teaching and study spaces and (b) music teaching and performance.**
- (d) Noise producing and noise sensitive spaces shall be located, designed and detailed so as to minimise noise interference between them. The sound insulation between classrooms of different activity, noise break-in, rain noise, room acoustics and their effect on speech intelligibility should also be taken into account during the design and detailing of the spaces.
- (e) Acoustic privacy is needed in areas, such as Principal’s and Deputy Principal’s Offices, Pastoral Offices in post primary schools and Multi-purpose Rooms in primary schools, where matters of a confidential nature may be discussed.

- (f) The elimination of the transmission of noise between spaces is a matter primarily for the Architect and Civil/Structural Engineer, however it is the responsibility of the Building Services Consulting Engineer to ensure that the building services installation does not infringe on required standards.
- (g) A minimum noise reduction of 45dB is required between teaching spaces, and between teaching spaces and other noise generating areas.
- (h) For noise reduction requirements to particular rooms refer to DoES:
  - TGD-022 Primary School Design Guidelines and TGD-023 Post-primary School Design Guidelines as applicable
  - **TGD-021-5 Acoustic Performance in Schools**
  - DoES TGDs for Mechanical and Electrical Building Services Engineering.

## 4.9 AIR-TIGHTNESS

- (a) Air-tightness is a major factor in controlling heat loss due to unwanted air infiltration into buildings. Good practice in building methods together with attention to construction detail and proper supervision of the works should ensure adequate performance in relation to building energy use and that buildings will meet or exceed the DoES current performance standard.
- (b) The requirement for air-tightness testing to specified standards applies to all new school buildings and extensions to schools in excess of **250m<sup>2</sup> gross floor area**.
- (c) All school buildings must be designed to a low energy in use strategy. Care should be taken by the Design Team to provide details that are capable of achieving and improving on the specified air seal boundary standard.
- (d) Air leakage less than **3m<sup>3</sup>/h/m<sup>2</sup>** of measured envelope area at a test pressure of 50Pa should be achieved (Buildings over **250m<sup>2</sup> gross floor area**). Measured envelope area shall be taken as the area of surfaces that make up the air seal boundary of the building. (External envelope area including roof, floor and wall areas, including wall areas above ceiling level)
- (e) The air seal boundary can be made up of many components for example a Radon Damp Proof Membrane (DPM), a wall air seal, the inner face of an external block wall, the window installation, the roof structure and an air-seal in the roof build-up.
- (f) The integrity of each component, which forms part of the air tightness layer, is essential and the junctions between these components are critical. Care must be taken at all envelope penetrations such as windows, doors and service entries applying appropriate sealing along the line of the airtight layer.
- (g) The sequencing of all installations is to be carefully considered when programming the work to achieve the airtight requirements.
- (h) A pressure test (Buildings over **250m<sup>2</sup>**) will be required to determine the building envelope performance and actual air leakage to verify compliance. Where a pressure test fails a smoke test will be required to identify points of failure and to facilitate rectification.
- (i) Further information on the preparation and testing required are available in [DoES TGD-021 CONSTRUCTION STANDARDS FOR SCHOOLS](#).

## 4.10 THERMAL BRIDGING, SURFACE CONDENSATION AND INTERSTITIAL CONDENSATION

- (a) There is an increased risk of condensation issues arising in modern highly insulated and relatively airtight school buildings which have a high vapour load and are not continuously occupied and heated all year round. The Design Team should ensure that the heating, ventilation, air infiltration and building fabric of schools are designed and detailed to limit such risks.
- (b) In order to limit surface condensation the internal air temperature should be regulated to ensure that internal surface temperatures remain above dew point. Occupant comfort levels

aside, all heated rooms should remain above 10°C at all times. Where relative humidity exceeds 70% for a prolonged period of time mould growth can occur. While it is accepted that in a naturally ventilated building it is not possible to precisely regulate relative humidity, Design Teams should be aware of the risks and design the background ventilation accordingly. Further guidance is provided in BS 5250:2011+A1:2016 “Code of practice for control of condensation in buildings”.

- (c) Design Teams should ensure that excessive heat loss due to thermal bridging is limited in accordance with the provisions of the Building Regulations Part L. The building fabric should be designed to avoid the risk of surface condensation, interstitial condensation and mould growth.
- (d) Demonstration of compliance with respect to thermal bridging and the risk of surface condensation may be achieved through the use of Acceptable Construction Details (ACD's) published by the Department of Housing Planning and Local Government where applicable.
- (e) In circumstances where relevant ACD's are not available or applicable, alternative details that limit the risk of mould growth and surface condensation should be assessed in accordance with IS EN ISO 13788:2012 including numerical modelling as described IS EN ISO 10211:2007 Part 1 & 2. Specific guidance in relation to modelling inputs is provided in BRE Report BR 497 (2<sup>nd</sup> Edition).
- (f) Generally designers have relied upon the “*Glaser method*” with respect to the risk of interstitial condensation in the building fabric. IS EN ISO 13788:2012 clearly states that this method “*does not provide an accurate prediction of moisture conditions within the structure under service conditions*”. Accordingly the hygrothermal performance of building elements at particular risk of interstitial condensation should be assessed in accordance with IS EN ISO 15026:2007 using simulation software. Such building elements would include roofs, solid wall construction, internal insulation (new build & retrofit), multi-layered constructions where different types of insulation are used and assemblies where low emissivity insulation (e.g. foil faces) is used not directly adjacent to a ventilated cavity.

## 5. HEALTH & SAFETY

### 5.1 STATUTORY REGULATIONS

- (a) All Design Team members must ensure that all current regulations relating to Safety, Health and Welfare at Work are taken into account in the design of all building projects. In particular Design Team members are required to comply in full with the [Safety, Health & Welfare at Work Act, 2005](#) and the [Safety, Health & Welfare at Work \(Construction\) Regulations 2013](#).

### 5.2 DESIGN TEAM DUTIES

- (a) Each Design Team member and the Design Team as a whole must consider safety in the design from the initial design sketches to the handover of the school building to the School Authority.
- (b) In particular all Design Team members must both individually and collectively identify, at all stages of the design process, any hazards that the design may present during construction, subsequent use and maintenance.
- (c) Where possible the hazards should be eliminated or the risk reduced. This is best carried out by a collective review of the Health & Safety issues with appropriate changes to the design at an early stage in the design process.
- (d) Where hazards cannot be eliminated provision should be made for control of those risks, and the transfer of the necessary information on those control measures and any outstanding risks, together with any design assumptions, to the Project Supervisor Design Process (PSDP) so that they can be dealt with in the Health & Safety Plan.
- (e) While all Design Team members must co-operate with both the PSDP and the Project Supervisor Construction Stage (PSCS), the primary responsibility for safety in design rests with each Design Team member individually and collectively.
- (f) The [Safety, Health & Welfare at Work Act, 2005](#) requires Design Team members to ensure that the project is capable of being safely constructed to be safe in use, can be maintained safely and complies with all relevant Health & Safety Legislation.

### 5.3 SAFETY OF OCCUPANTS DURING CONSTRUCTION WORKS

- (a) As part of the above duties of the Design Team, Design Team members should seek to anticipate any potential danger to the school pupils/students, staff and/or visitors as a result of work taking place near to, or within areas where educational services are being provided, and seek to eliminate those hazards or reduce the risk through design, choice of location, phasing, programming of works, etc.
- (b) In particular the arrangements for safe entry and egress of building construction traffic during construction should be considered at the initial sketch design stage.

## 6. BUILDING LOCATION & ORIENTATION

### 6.1 BUILDING LOCATION

- (a) Whether the Brief defines a particular location or a range of possible locations on a site, the Design Team must evaluate the briefing information provided and must assess the suitability of those locations.
- (b) The evaluation should include the suitability of the site(s) for intended educational function, and all the parameters identified in this guidance document such as Health & Safety, Universal Access, security, allowance for expansion (both building and external facilities), environmental considerations, etc.
- (c) Allowance for future building and external expansion must be at least 33%. Capacity for expansion of external facilities must include for future external circulation requirements, additional car-parking and extra ball-courts.
- (d) In addition, the availability, location and adequacy of site services and public utilities, site levels, ground conditions, locations of external facilities, buildability and any possible planning restrictions should also be considered.
- (e) As well as assessing the Health & Safety implications of a given site location, the Design Team must also consider the construction activities required and their sequence, and assess the level of disruption to existing school activities at the initial sketch design stage. The level of such disruption should be kept to a minimum through consideration of alternative design strategies at the earliest possible stage in the design process including building location.

### 6.2 BUILDING ORIENTATION

- (a) Building orientation should be considered in the context of a balance of requirements including site and building access, waste management, security, natural day-lighting and energy efficiency.
- (b) Schools with teaching spaces facing easterly will benefit from early morning solar heating and thus have reduced heating requirements. For solar gain purposes, teaching spaces should be prioritised on the east and south elevations.
- (c) Rooms that are at risk of overheating due to the functionality of the room should be prioritised on the north or west elevations, provided they do not require direct sunlight for teaching purposes.
- (d) Refer also to the relevant sections in the DoES TGDs for Mechanical and Electrical Building Services Engineering for further guidance on building orientation.

## 7. CONSTRUCTION & DEMOLITION WASTE MANAGEMENT

### 7.1 BACKGROUND

- (a) The recycling of Construction and Demolition (C&D) waste is essential in order to reduce our dependency on finite natural resources such as geological and energy reserves. While recycling of such material has the added benefit of controlling the extent of waste disposal and reducing overall transportation costs, prevention is the most desirable approach to waste management, since the elimination of waste removes the need for subsequent handling, transportation and treatment of discarded materials.
- (b) The Waste Management Acts (WMA) 1996 to 2005 and associated regulations create a “cradle to grave” responsibility for the management of waste.

### 7.2 WASTE MANAGEMENT PLAN

- (a) All Designers are required to prepare a Waste Management Plan for each project and adopt an integrated approach to C&D waste management to ensure that the management of construction and demolition waste is given due consideration throughout the duration of a project.
- (b) The requirement for such plans applies to all school construction projects that generate construction & demolition waste. Construction and demolition waste is defined as waste which arises from construction, renovation and demolition activities, including surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of onsite activities.
- (c) As part of that Waste Management Plan designers should carefully consider the location and ground floor level of buildings to minimise the need for disposal of excavated waste. Where practical designers should also consider whether non-toxic waste (e.g. excavated earth, builder’s rubble, etc.) can be retained on site as part of the overall landscape arrangement.

## 8. UNIVERSAL ACCESS

### 8.1 DESIGN PHILOSOPHY

- (a) All new school buildings and extensions to schools should be designed to cater for persons with varying ranges of physical ability and they must not be disadvantaged by design limitations.
- (b) Access for All should be provided in all new building works and shall be in accordance with the Building Regulations Part M Access & Use. The criteria set out in the current publications of the National Disability Authority should also be considered in all cases.
- (c) **With regard to universal design principals a general guide to best practice prepared by the Centre for Excellence in Universal Design of the National Disability Authority ([www.nda.ie](http://www.nda.ie) / <http://universaldesign.ie/Built-Environment/Building-for-Everyone> ) is available.**

### 8.2 EXTERNAL

- (a) Provision should be made for universal access from the site perimeter to the school building, with universal access routes to all main building entrances.
- (b) At least one dedicated car-parking space near the main entrance should be provided for disabled users and the number of reserved spaces shall be in accordance with the DoHPLG Building Regulations and the National Disability Authority guidelines.

### 8.3 INTERNAL

- (a) All new school buildings and extensions to schools shall be designed so as to provide universal access for all. All entrances must be universally accessible. Persons with varying ranges of ability shall not be disadvantaged by design limitations.
- (b) Suitable provision for access to any storey above or below entrance level shall be provided as per the requirements established in the Building Regulations. Where small changes of level within the building are unavoidable ramps (in accordance with the Building Regulations Guidance Documents and the National Disability Authority guidelines) are permitted.
- (c) **Suitable Refuge Areas for persons with disabilities incorporating two-way Emergency Voice Communication (EVC) systems to a central monitoring station in the Administration/General Office shall be provided on each floor in stairwells in multi-storey school buildings. Refer to DoES TGDs for Mechanical and Electrical Building Services Engineering for further information.**
- (d) **Accessible sanitary facilities should be located in convenient and accessible parts of the school and be clearly identifiable.**
- (e) **A Unisex Universal WC should be provided close by every toilet block provided in a school. They should also be located so as to facilitate access from the main entrance as well as minimise travel distances within the building.**
- (f) **Where WC cubicles are provided in a sanitary facility, at least one WC should be provided for ambulant disabled people.**
- (g) **Where four or more WC cubicles are provided in a sanitary facility, one cubicle should be an enlarged cubicle.**
- (h) **At least one Toilet/Shower for Assisted Users per floor should be provided in school buildings. In post primary schools with a Multi-use Hall one shall be provided adjacent the changing rooms.**
- (i) **All fittings and ironmongery associated with accessible facilities should be capable of being operated using a closed fist.**
- (j) **Accessible sanitary facilities should have outward opening doors. If inward opening doors are provided the size of the area should be increased so that the door swing does not**

- encroach into the wheelchair turning space and the door should have emergency release hinges.
- (k) Grab/hand rails should be contrasted in colour against walls and floors (refer to BS 8300 Annex B).
  - (l) Refer to DoES TGD-021.2 Guidelines and Standards for Sanitary Facilities in Primary Schools and TGD-021.3 Guidelines and Standards for Sanitary Facilities in Post-Primary Schools for further information on what exactly is required in schools.
  - (m) Refer also to the Building Regulations Part M Access & Use.

## 8.4 LIFTS

- (a) Where design proposals involve two or more stories, a lift will normally be required unless the upper floors are less than 200m<sup>2</sup> in area and the same range of accommodation for all building users is available at ground floor level.
- (b) The location of the lift shall be adjacent to the main school entrance and visible from the main doors. It shall where possible be an integrated design solution within the same fire compartment and present itself as a feature in the main circulation area rather than be located on a dead end corridor.
- (c) The lift shall not reduce the minimum width requirements for circulation within its vicinity.
- (d) The design solution shall take into account the number of floors and travel distances involved, expected usage demand, maintenance costs, ancillary space requirements, builders work and life cycle costs.
- (e) Hydraulic or traction type passenger lifts shall be provided in all new school buildings.
- (f) Lifts shall comply with the Building Regulations in particular Part M Access & Use and also comply with EN Standards on lifts including *Directives EN 81-20 & EN 81-50*.
- (g) Refer to DoES TGDs for Mechanical and Electrical Building Services Engineering for further information on lift installations in schools.

## 9. AIDS TO COMMUNICATION – HEARING IMPAIRMENT

- (a) In new schools and extension to schools provision for hearing impaired persons shall be provided via induction loop systems in the following areas:
- Primary Schools:
- GP Room
  - Reception area of administration office
- Post Primary Schools:
- Multi-use Hall
  - General Purposes Area
  - Reception area of administration office.
- (b) Surface mounted induction loop systems shall be provided in these spaces.
- (c) Where considered necessary in other areas of school buildings it shall be via portable induction loop systems or personal infrared equipment. The provision of this type of equipment does not form part of a Building Contract. The school authority shall supply these as part of the school's Schedule of Furniture & Equipment.
- (d) Refer to DoES TGDs for Mechanical and Electrical Building Services Engineering for further details.

## 10. SCHOOL SIGNAGE

### 10.1 OFFICIAL LANGUAGE ACT 2003

- (a) All signage shall comply with the Official Language Act 2003, as amended and associated regulations. In particular the text on all signage shall be printed in Irish or bilingual i.e. Irish & English. The text in Irish shall appear first, it shall be as prominent, visible and legible as the English text, it shall not be smaller than the English text, it shall communicate the same information as the English text and it shall not be abbreviated unless the English text is abbreviated.
- (b) Where it is considered that the bilingual sign would be too big or difficult to read or is likely to cause an obstruction or that people, while reading it, would be likely to constitute a danger to the school or others, then two signs may be erected at that location, one sign with information in Irish and the other with the information in English.
- (c) All oral recorded announcements shall comply with the Official Language Act 2003, as amended and associated regulations and shall be in Irish or bilingual i.e. Irish & English. This includes recorded messages on telephone systems, recorded announcements in lifts and recorded announcements on other public address systems.
- (d) The regulations in Irish Language Act 2003 do not apply to traffic signs covered by the Regulations under Section 95(2) or an order under Section 95(16) of the Road Traffic Act 1961 or to signs covered by the Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016).
- (e) For further information on the Irish Language Act 2003 see [www.coimisineir.ie](http://www.coimisineir.ie)

### 10.2 GENERAL SCHOOL SIGNAGE

- (a) All signage shall comply with DoHPLG Building Regulations in particular Technical Guidance Document M (Access and Use) and guidance provided in both Building for Everyone: A Universal Design Approach - Part 4 *Internal Environment and Services* available at [www.nda.ie](http://www.nda.ie) and the Sign Design Guide available at [www.ncbi.ie](http://www.ncbi.ie). Also for further guidance on sign design refer to BS 8300:2009.
- (b) The objective is to provide, as part of the contract, adequate signage to (i) easily identify the school from the public road and (ii) support the safe and efficient movement of the end users and general public around the internal and external environs of the school building. The final strategy for the level of signage, directional information and distinguishing features as well as the approach to general movement throughout the building and site shall be prepared for each project facility.
- (c) Adequate signage or way-finding shall be provided where necessary to assist the end users and visitors to understand the layout of the building and site. The signage throughout the project should give clear directions for all users and shall be fully integrated into the design of the project. Signs shall be uniform in type and positioned in a similar manner throughout the project.
- (d) Signage shall be clearly visible, especially for visitors, directing them from the entry to the site to the main entrance/ reception area of the school including directions to areas such as public entrance/reception area, student entrance, staff entrance, all public access areas (Sports Hall, car parking, etc.) where these areas are not otherwise easily identifiable.
- (e) External signage shall include signs to identify speed restrictions within the site.
- (f) Signs indicating that schools are a no smoking environment shall be provided at all entrance doors and other prominent locations.
- (g) Where elements of the school are open to the general public for community use additional directional and nameplate signage will be required to identify these areas. The Design Team must consult the School Authority as to the intended scope of such signage.

- (h) All proposed school signage should be agreed with and checked by the School Authority prior to manufacture to ensure correct names, crests, spellings and grammar are used.
- (i) Road markings on private roads within the school site may be in Irish, English or bilingual, i.e. Irish & English. Design Teams shall consult with the school authority/ client and agree which is the preferred option on each project.
- (j) Typical external school branding signage shall include:
  - Directional signage – typically brown background and white engineering grade reflective text – this is required where the site is located away from the public road and a directional sign is required to direct the public to the school site.
  - Site way-finding signage – typically directional signage on site to direct the end users and general public to areas such as public entrance/reception area, student entrance, staff entrance, all public access areas (Sports Hall, car parking, etc.).
  - Main identification signage – detailing the name of the school and other pertinent information such as school crest, etc. Typically 300 – 400 mm high popped off acrylic or stainless steel lettering affixed to the school building.
- (k) Typical internal signage and way-finding signage shall include:
  - Signage to provide directions and clearly identify the areas within the school building which will have public access i.e. the main reception area/ general administration office, community facilities etc.
  - A nameplate on every door clearly identifying the room name/ use and room number.
  - Signage to denote different departments within the school, e.g. Science Department, Engineering Department, etc.

## 10.1 AIDS TO COMMUNICATION - SIGNAGE

- (a) All signage, both internal and external, should have a high colour contrast with its background and include embossed lettering, braille and a braille indicator/ locator.
- (b) Door signage should be placed on the wall adjacent to the leading edge of the door face with consistent positioning at each door. The centre line of the sign shall be situated at 1400mm above floor level.
- (c) Lettering should be 16 to 50mm high, 1.0 to 1.5mm raised embossed Sans Serif typeface, have a minimum colour contrast of 70% and the first letter of names and messages should be a capital letter with all other letters lowercase.
- (d) Braille should be positioned below related text with braille locator located at the start of the braille. Use Grade 1 braille for single works and Grade 2 braille for signs with several words.
- (e) Where possible international pictorial images/ symbols/ icons should be used in place of text or to supplement text. Where arrows are used these should be consistent throughout the signage scheme and where a number of destinations are located in the same direction, they should be grouped together on a sign and share a single arrow.
- (f) Glare should be minimised, avoid the use of reflective glass and ensure that the sign has a matt surface/ finish.
- (g) For further information refer to the Building Regulations Part M (Access and Use), guidance provided in both Building for Everyone: A Universal Design Approach - Part 4 *Internal Environment and Services* available at [www.nda.ie](http://www.nda.ie) and the Sign Design Guide available at [www.ncbi.ie](http://www.ncbi.ie) and BS 8300:2009 Guidance on Sign Design.

## 10.2 SAFETY SIGNAGE

- (a) Safety signs should comply with statutory requirements and European standards. Safety signs should use the universally established colour code of green for safety, yellow for risk alert, red for prohibition or danger and blue for mandatory action. Refer to the Safety Health and Welfare at Work (General Application) Regulations 2007 (Chapter 1 of Part 7: Safety Signs at Places of Work) for information on safety signs.

## 11. SECURITY

### 11.1 SITE SECURITY

- (a) The security of the school premises, environment and site is an important part of the safety of students, staff and visitors. Each school will require different solutions and a security design strategy should be developed with the School Authority at an early stage in the design process to take account of the school's particular and unique requirements.
- (b) An effective security strategy must commence with the design of the site boundary. Issues that must be considered are the need to deny unauthorised vehicular access, to restrict the avenue of escape and to delay intrusion sufficiently to maximise the possibility of detection. All gates should have anti-lift hinges.
- (c) A rumble strip, or change of road surface by colour or texture, should be incorporated at the road entrance to create a symbolic psychological barrier and reinforce the impression that beyond this barrier is private to the school.
- (d) The use of shrubs as an active perimeter should also be considered, as should the use of landscape type trenches to prevent vehicular access. A sterile area should be provided inside the perimeter fence free from all obstructions so that aids to scaling or concealment are not afforded.
- (e) Passive natural surveillance is critical in the protection of schools given their long unoccupied hours. Landscaping must not impede this form of surveillance and should not create potential hiding places or provide climbing aids. See also [SECTION 11.3 CLOSED CIRCUIT TELEVISION CAMERAS](#) herein.

### 11.2 BUILDING SECURITY

- (a) The school buildings should be sited so that there is passive supervision from surrounding properties and roadways. An effective security strategy should also focus on the building perimeter.
- (b) The external façade of the building should be such that unsecured alcoves or covered areas are eliminated. Access to flat roofs or low-pitched roofs should be eliminated by appropriate eaves overhangs and recessed or flush-faced down-pipes.
- (c) In order to achieve good security, the number of entry points should be minimised. This requirement should be balanced with the need for efficient access and egress of pupils/students, staff and visitors. It is important that security measures should not conflict with fire safety and adequate means of escape when the building is occupied.
- (d) Each school should have a Secure Lobby at the main entrance with a natural view of the front entrance door through a hatch in the Administration Office wall. **The hatch should be lockable, capable of withstanding physical assault and should have the same fire rating as the wall in which it is located.**
- (e) External doors should be robust and should be capable of withstanding physical assault.
- (f) Where external security lighting is provided it should be such that it does not provide a floodlight facility for out of hours playing, congregating, etc.
- (g) Active security systems should also be included as outlined in DoES TGDs for Mechanical & Electrical Building Services Engineering.
- (h) Security measures should create a safe environment for pupils/students and staff while discouraging access by unauthorised members of public. Security measures should be discreet.

### 11.3 CLOSED CIRCUIT TELEVISION CAMERAS

- (a) A Closed Circuit Television (CCTV) Camera Installation shall be provided in all new schools as a means of monitoring and recording the main school entrances. For further details see DoES TGDs for Mechanical & Electrical Building Services Engineering.
- (b) The CCTV camera installation shall not be covert but rather be visible.
- (c) It shall be designed so that the specification is open enough to allow any competent security company/contractor to tender for the contract, but sufficiently specific to ensure that competing companies cannot gain an unfair advantage by quoting for inferior equipment.
- (d) Where the basic CCTV camera installation is not deemed sufficient for a particular school additional coverage may be considered. Refer to DoES TGDs for Mechanical & Electrical Building Services Engineering for guidance.
- (e) If a school wishes to extend the basic installation at its own expense, the spare capacity on the monitoring and recording system may be used for additional cameras. Priority must be given to additional external cameras as it is not the DoES policy to fund the provision of internal CCTV cameras in schools.

## 12. EXTERNAL CIRCULATION

### 12.1 ACCESS TO SCHOOL SITE

- (a) The access to the school site should be prominent, clearly sign posted and easy to find, with the school building and its entrance clearly visible.
- (b) External movement on the site both vehicle and pedestrian shall comply with the Building Regulations in particular Technical Guidance Document M (Access and Use).

### 12.2 TRAFFIC MANAGEMENT

- (a) The combination of pedestrians (including children) and vehicles particularly at the peak times that occur during every school day is a serious hazard that requires careful risk management. Thus the initial design stage of the school should include careful consideration of the layout of pedestrian, cycle, and vehicular access.
- (b) It is a requirement that traffic routes around school premises are organised so that pedestrians and vehicles both may circulate safely; the routes are suitable for the people or traffic using them, sufficient in number, in suitable positions and of sufficient size. It is also a requirement that there is sufficient separation of any traffic route from doors, gates, and pedestrian and cycle routes that lead onto it.
- (c) If pedestrians, cycles and vehicles have to share the same route, care should be taken that the routes are clearly marked and there is sufficient separation between them.
- (d) Special attention should be given to access for people with restricted mobility, e.g. the partially sighted, those with walking difficulties and wheelchair users. Consideration should be given to their safety in the design of kerbs, white-marking, lighting, steps, ramps (steepness, surface finish, handrails). Other factors to be taken into account are protecting people from vehicle exhaust fumes, determination and enforcement of sensible speed limits, and parking arrangements.
- (e) All traffic control measures must have clear signage so that visitors are in no doubt as to how they must proceed and where they should go.
- (f) Design Teams must ensure that all current regulations relating to Safety, Health and Welfare at Work is taken into account in the layout of roads and footpaths.

### 12.3 PEDESTRIAN & CYCLE ACCESS

- (a) Pedestrian and cycle routes should take priority over vehicular ones. Footpaths should be designed to suit the school needs, with ease of access in mind, and should follow the safest and most direct routes.
- (b) The use of bicycles is encouraged and secure covered cycle parking facilities should be provided. If bicycle racks are provided, these should be adjacent to the student entrances.

### 12.4 VEHICULAR ACCESS & PARKING

- (a) On-site roads and vehicular access should be kept to a minimum while ensuring ease of parking and access to the main school entrance doors. Where practical Service Delivery Access should be separated from pupil/student access.
- (b) The design should facilitate access for emergency vehicles while minimising the length of onsite roads and shall be in accordance with the Building Regulations. Access for emergency vehicles should be considered carefully in conjunction with the layout of parking and hard play areas.
- (c) Where a suitable drop-off point for students from buses and cars is not available within a reasonable distance of the school, provision for a lay-by to facilitate buses and/or cars should be made. Where possible this lay-by should not be located within the school grounds

and arrangements should be made if necessary to cede the appropriate land to the Local Authority.

- (d) Provision within the site of turning circles, lay-by and drop-off points should be avoided where possible. Where a fire-tender turning circle on site is required, this should be incorporated into the overall traffic management layout.
- (e) Suitable access routes from drop off points to the school building entrances should be provided. Drop off points should be convenient but must not obstruct pedestrian or cycle access.
- (f) Car parks should be located as near as possible to the main site entrance but also located where they can be viewed from the school. Allowance should be made where possible for future expansion of parking areas. Parking provision should be as stated in the brief but subject to current planning requirements.

## 12.5 SERVICES ACCESS

- (a) Vehicular access to boiler rooms, and service yards (Post-primary), must be provided. Such access routes must be minimised by design and by utilising other access routes (e.g. fire access, parking access, etc.) as much as possible.

## 13. INTERNAL LAYOUT

### 13.1 LAYOUT

- (a) The proposed layout should provide spaces that are well proportioned, efficient, fit for purpose and meet the requirements of the brief without wasteful or redundant circulation. The layout should enhance the operational efficiency of the school activities and the orientation of the building should take full advantage of the opportunities offered by the site.
- (b) There shall be a clearly organised building layout which enables ease of circulation which, when complemented with use of colour, finishes and signage, assists the end users in ease of movement and way finding.
- (c) The design insofar as is reasonably practical should be adaptable to cater for future change of use (or expansion or contraction of facilities) and for flexibility in the use of teaching and social spaces. The design of shared spaces should be adequately considered to prevent conflicts.

### 13.2 CAPACITY FOR EXPANSION

- (a) It is important that the building be flexible and capable of future expansion (at least 33%). The design of the building should allow for future change and the possible addition of further accommodation. The possibility of expansion should be considered when determining the organisation and layout of the building so that it can still operate effectively if a future extension is required.
- (b) Main service distribution and location of the primary Building Services boiler rooms should also take account of the likelihood of future expansion.

### 13.3 BUILDING ACCESS

- (a) Depending on the size and layout of the school, and how the school operates, separate entrances for staff, pupils/students and visitors may be appropriate.
- (b) The main entrance is the point of access for all visitors. It should be prominent and easy to find by the pedestrians entering the site and should be easily accessible from the car-parking area. It should be well sized, welcoming and attractive. The design should provide for a safe and secure school access for pupils/students, staff and visitors. **The safe operation of the main entrance doors must also address issues arising from high winds and gusts. In some cases the main entrance may need to be designed so that the external doors face away from prevailing winds.**
- (c) A visitor, upon arrival in the secure entrance lobby of the school building, should be able to communicate with reception without difficulty and without access to the rest of the school building. Refer to [SECTION 11.2 BUILDING SECURITY](#) above.
- (d) Some protection from the weather prior to entering the main door should be considered. Draught lobbies should be provided to all entrances in common use (not if doors are for escape only). Heating should not be provided in the lobby and the finishes should reflect its function as an unheated space.
- (e) Radiators within the entrance hall areas should not be located adjacent to external doors.

### 13.4 INTERNAL CIRCULATION

- (a) The design solution for all schools should ensure ease of circulation and orientation/way-finding for students, staff and visitors including those with special needs. On accessing the school via any entrance, it should be possible to move to any point in the school without meeting an area of congestion.
- (b) In Post-primary Schools consideration should also be given to easing areas of possible circulation congestion by combining circulation with GP/Dining area and social areas. This is not possible in primary schools due to the different functions of the G.P. room.

- (c) All rooms should be accessed from a circulation route, except store rooms accessed directly from learning spaces. Minimum clear width of corridors must be 2.4m in post primary schools and 1.8m in primary schools.
- (d) Lockers in post primary schools should be located in circulation routes with sufficient space allowed in front of the lockers for ease of access and to allow some congregation without blocking circulation. An overall recess of **1560mm (includes locker space)** should be provided. Refer to DoES [TGD-023 POST-PRIMARY SCHOOL DESIGN GUIDELINES](#), ROOM DATA SHEETS ANCILLARY SPACES. Lockers are not provided in primary schools.
- (e) The area of internal walls will occupy an area equivalent to at least 3% of the net area, and up to **7%** if the walls are wider to allow for acoustic separation and/or to provide thermal mass. Where less than **7%** of the net area is used for internal divisions, the unused area may be allocated to circulation.
- (f) Notwithstanding the [Building Regulations, Part K Stairways, Ladders, Ramps & Guards](#), all guarding to landings and balconies shall be increased in height from 1100mm to a minimum of 1400mm above finished floor level. They should be continuous, without gaps, and detailed to minimise climbing, footholds or grip points. In all cases, each designer must carry out a risk analysis and determine an appropriate height for each guarding / rail.
- (g) **A second handrail of 35mm diameter should be installed at 600mm high to both sides of all stairs in primary schools. Where the second handrail presents a climbing hazard or risk the balustrading should be carefully designed to eliminate such risks. The choice of guarding materials should be carefully selected to provide a high quality design solution and avoid a closed in effect.**
- (h) **Where voids are proposed at 1st floor, balustrade level must be minimum 1400mm high. Voids at 2nd floor and above should be fully enclosed with appropriate glazing and designed for intended purpose.**

### 13.5 FLOOR TO CEILING HEIGHTS

- (a) Ceiling heights should be considered in the context of the size and function of the space and should take into account the physical environment within that space.
- (b) In larger rooms such as specialist rooms and assembly areas the height should be in proportion to the size and take into account the function and any specialist requirements such as ventilation.
- (c) In general floor to ceiling heights shall be not less than the following:
  - Floor Areas > 25m<sup>2</sup>: 3.0m (Primary) & 3.15m (Post Primary)
  - Floor Areas < 25m<sup>2</sup> (Excluding boiler house): 2.7m (Primary) & 2.7m (Post Primary)
- (d) In addition to the above requirements Design Teams should refer to DoES [TGD-022 PRIMARY SCHOOL DESIGN GUIDELINES](#), [TGD-023 POST-PRIMARY SCHOOL DESIGN GUIDELINES](#) and the DoES sample Room Layouts for Primary Schools & Room Layouts for Post Primary Schools as applicable for minimum heights for specific rooms.

### 13.6 EMERGENCY EXITS

- (a) All emergency exits should be well signposted and shall be in accordance with the Building Regulations.
- (b) All stairs should have a dual function of emergency circulation and providing access to accommodation in order to optimise floor area.

### 13.7 BOILER ROOM & ELECTRICITY CENTRE LOCATIONS AND WATER STORAGE

- (a) **Boiler rooms and electricity centres** should be located so as to provide for economic distribution of services. They should not be located at the outer extremities of the building or as an annex.

- (b) Where Utility equipment needs to be located on the school site (e.g. electricity supply transformer) it should be positioned to allow access by the Utility Company from the public thoroughfare.
- (c) Water tanks for storing potable and non-potable supplies shall be located at sufficient height to allow operation of these services by gravity, and without the need for pumped assistance. Tanks should ideally be located in one internal area with sufficient space for maintenance and replacement, and with appropriate safe access.
- (d) Refer to DoES TGDs for Mechanical & Electrical Building Services Engineering for more detailed guidance on boiler room and electricity centre design and location.

### 13.8 DISTRIBUTION OF SERVICES

- (a) The distribution of services shall be integrated into the building form and design. The teaching and habitable spaces must not be used as primary distribution zones for exposed services. The distribution of the mechanical services shall not impact on the teaching environment of the school and shall not create catchment areas for rubbish, etc.
- (b) The routing of general services through stores, Data Communication Centres (DCC), and classrooms should be avoided, as also should the locating of switchgear in areas where flammable or corrosive materials are likely to be stored.
- (c) In new school builds and extensions to existing schools, the design of the heating systems and building distribution zones shall be such as to eliminate in full the need for floor ducts or services buried in the floors.
- (d) In refurbishment projects where the routing of pipe work in the floor to cross doorways is unavoidable, the pipe work shall be adequately insulated and have corrosive resistant properties. See also DoES TGDs for Mechanical & Electrical Building Services Engineering.

## 14. EXTERNAL LANDSCAPING

### 14.1 LANDSCAPE DESIGN

- (a) Refer also to [SECTION 11.0 SECURITY](#) above.
- (b) Provision should be made for the preparation and landscaping of the area around the school and between the school and the site entrance. Such landscaping should be simple, cost effective and easy to maintain.
- (c) The external spaces and landscape design must be considered as an integral part of the project from the outset.
- (d) The design should utilise fully the potential for external spaces to provide an attractive setting. The type and layout of the landscaping in conjunction with the scale and form of the buildings has a potential to contribute positively to the school environment and the neighbourhood.
- (e) The Design Team should consider the natural routes for footpaths through the site to the school entrances in determining the appropriate location and extent of paths provided.
- (f) The use of paving textures, artworks and planting should be considered to create diverse sensory experiences within the school grounds whilst aiding the recognition of routes for students and visitors.
- (g) An allowance for planting of trees and shrubs should be made. Such shrubs and trees should help define the site boundaries and external circulation routes, and should be hardy, durable and low maintenance.
- (h) The locations of trees and shrubs close to the building should be carefully planned so as not to interfere with average daylight levels in teaching spaces and offices as they grow and mature. They should also take into account site security should it become an issue for the school in the future (e.g. the provision of external column mounted CCTV cameras and associated security lighting to provide a security curtain around the building as outlined in DoES TGDs for Mechanical & Electrical Building Services Engineering.
- (i) The external landscape can also include 'biodiversity areas' if required by the school. These can provide a valuable resource for teaching and learning across the whole curriculum, as well as for children's emotional, social and cultural development. Where provided the biodiversity area may include meadowland, wildlife habitats, gardens and outdoor science areas.
- (j) In order to minimise energy consumption and to encourage biodiversity, consideration should be given to the provision substantial "wild areas" with minimal mowing requirements, for example, once or twice per annum, rather than frequent mowing regimes that result in sterile mono-cultures.
- (k) **Where space permits grass kick-about practice areas can be provided. See TGD-022 and TGD-023 for further guidance.**

### 14.2 SOCIAL SPACES

- (a) A variety of informal and social areas should be created to suit the learning development and cultural needs of pupils/students during breaks and before and after school, and for a range of more formal curriculum needs.
- (b) These will include soft surfaced, usually grassed, areas and hard-surfaced courtyards, paths and playgrounds. Landscape design adds to the quality of the overall environment and the setting of the building. The basic landscape design should be provided as part of the project with the school having the responsibility to develop and complete the plan. This has the potential for promoting a sense of ownership of space by pupils/students and staff, thereby encouraging people to take greater care of their surroundings. See also [SECTION 14.1 LANDSCAPE DESIGN](#) above.

**14.2.2 SOFT AREAS**

- (a) Soft areas should be conveniently situated, safe, and provide some shade. Imaginative landscaping and planting can provide a range of outdoor areas, including quiet areas with universal access. The selection of path finishes should facilitate universal access. Refer also to [SECTION 8.2 UNIVERSAL ACCESS](#) above.
- (b) These areas may include grassed space(s) to sit and socialise; sloping grass areas for spectators or a natural amphitheatre and landscaped or planted areas near to buildings.

**14.2.3 HARD AREAS**

- (a) To complement the soft informal and social areas, the design may include hard-surfaced play spaces and sheltered spaces for socialising and for the encouragement of active and creative outdoor play. These areas can be used to provide scope, through a range of hard surfaces and structures, for pupils/students to engage in outdoor art, theatre, dance and design.
- (b) Appropriate site furniture, such as seating, to accommodate a range of pupil numbers, should be provided.
- (c) Large areas of hard landscaping should be avoided.

## 15. PERCENTAGE FOR ART SCHEME

- (a) The Government decision of August 1997 approves the inclusion in the budgets for all capital construction projects of up to 1% as funding for an art project, subject to specified limits.
- (b) Capital Works projects are allocated a [Percentage for Art Scheme](#) budget which is separate from the construction budget.
- (c) Ideally, planning for the appropriate work of art should be initiated at the early design stage so that the Design Team can make appropriate allowances for the piece during design. While the % for Art scheme is outside the remit of the Design Team and the Construction contract, the Design Team will need to consider the nature and size of the art work so that adequate provision is made for its placement.
- (d) The Artist should be introduced to the Design Team who may be in a position to offer advice on lighting, foundations, structural loading and other matters as may be necessary for the satisfactory completion of the commission. The planning and commissioning process should commence as expeditiously as possible as soon as permission to proceed is given.
- (e) Further details are available on the [DoES web-site](#) and the [Public Art: Per Cent for Art Scheme-General National Guidelines - 2004](#).

## APPENDIX A: SCHEDULE OF MAIN AMENDMENTS

Amendment	Date	Section	Change
1	October 2017	1.3	List of TGDs omitted and reference to website only included
2	October 2017	3.3, 3.4, 8.1 & 8.3	References to Universal Design included or updated
3	October 2017	3.7 & 3.8	Scope of Mechanical & Electrical services updated
4		4.4	Active technologies to be considered
5	October 2017	4.5	Guidance on Natural Ventilation and Overheating updated
6		4.6	New Section on indoor air quality (Radon and other Gases) included
7	October 2017	4.7	Guidance on Natural Daylight updated
8	October 2017	4.7.1	Guidance on window blinds included
9	October 2017	4.8	Reference to DoES TGD021.5 Acoustic Performance in Schools included
10	October 2017	4.9	Air tightness standard updated
11	October 2017	4.10	New section on Thermal Bridging and Condensation included
12	October 2017	8.4	Guidance on lifts updated
13	October 2017	9	Guidance on induction loops updated
14	October 2017	10.1 – 10.4	Entire new section on Signage
15		11.2(d)	Requirements for hatch in secure entrance lobby
16		13.3(c)	Safe operation of main entrance doors
17	October 2017	13.4(d)	Space for lockers in post-primary schools
18	October 2017	13.4(g)	Introduction of 2 <sup>nd</sup> handrail at 600mm high
19	October 2017	13.4 (h)	Treatment of voids in floors in multi-storey schools
20		13.7(b)	Positioning of Utility equipment on site
21		13.7(c)	Positioning of water storage tanks
22	October 2017	14.1(k)	Grass play areas