Planning & Building Unit

Technical Guidance Document TGD-020

General Design Guidelines for Schools
(Primary & Post-primary)

1st Edition, August 2007

Planning & Building Unit
Department of
Education and Science
Tullamore, Co. Offaly.

Telephone: 05793 24300
Fax: 05793 51119

Web: http://www.education.ie

PLANNING AND BUILDING UNIT

Contents

1.0 Introduction

1.1 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 Client* and 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 Science is the Client, but for the purposes of this document the term "Client" shall also encompass the School Authorities.*

1.2 Design Guidance Suite

(a) The General Design Guidelines for Schools (Primary and Post-primary) is part of a suite of Department of Education and Science [DoES] design guidance documents for Primary and Post-primary schools which includes:

DoES Technical Guidance Document [TGD]	DoES -TGD
General Design Guidelines for Schools	020
Construction Standards for Schools	021
Primary School Design Guidelines	022
Post-primary School Design Guidelines	023
Post-primary Fixed furniture Details	024
Post-primary Room Layouts	
Mechanical & Electrical Building Services Engineering Guidelines for Temporary Accommodation School Buildings	001
Mechanical & Electrical Building Services Engineering Guidelines for Primary School Buildings	002
Mechanical & Electrical Building Services Engineering Guidelines for Post-primary School Buildings	003
Information & Communication Technology (ICT) Infrastructure Guidelines for Primary Schools	004
Information & Communication Technology (ICT) Infrastructure Guidelines for Post-primary Schools	005
Energy Information Form	006

All of the above Guidance Documents are available on the Department of Education & Science web-site at www.education.ie.

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1.0 Introduction (continued)

1.2 Design Guidance Suite (continued)

(a) 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 and
- All other DoES Technical Guidance Documents published on the Department's web-site.

➨ *Always check the Department's web-site for the most up-to-date version.*

(b) In applying these guidelines to projects, clients and design teams will be obliged to comply in full with the current Design Team Procedures, DoES Technical Guidance Documents and other guidance issued by the Department, except as stated in 1.4 Application below.

(c) The above Suite of Design Guidance documents replace all previous Design Guidelines both Primary and Post Primary.

1.3 Design Team Procedures

(a) The Design Team Procedures [DTPs] set out the scope of service for all consultants 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, obtaining tenders, Construction and Final Account.

(b) The DTPs apply to all construction projects funded in part or in total by the Department of Education & Science unless otherwise directed by the Department in writing.

1.4 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 Department of Education & Science (unless otherwise directed by the Department in writing) where a decision to commence architectural design and planning has been confirmed in writing by the Planning and Building Unit.

(b) In the case of Special Schools, additional guidance and direction should be sought from the PBU, and some of the following guidance will not be applicable.

(c) The scope of the building project will be the schedule(s) of accommodation and other briefing instructions as agreed between the Client and the PBU.

(d) Where it is proposed to construct a new school these guidelines and all associated documents in the suite of Design Guidance should be applied in full.

Continued overleaf

1.0 Introduction (continued)

1.4 Application (continued)

(e) 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 Primary School Design Guidelines, the Post-primary School Design Guidelines, and the Post-primary Room Layouts will apply in full to the new build portion of the project.

(f) The dimensions and 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.

1.5 Further information

(a) This document and all other Guidance Documents mentioned above are available on the Department of Education and Science web-site at www.education.ie. •

• *Always check the Department's web-site for the most up-to-date version*

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

Department of Education and Science,
School Building Unit,
Portlaoise Road,
Tullamore,
Co. Offaly.
Telephone: (057) 9324300
Fax: (057) 9351119

1.6 Comments & Suggestions

(a) The Department of Education and Science welcomes comments and suggestions on how to improve these guidelines. Such comments and suggestions should be sent by email to Technical_staff@education.gov.ie.

(b) All comments and suggestions will be considered at the next review of this document and, where appropriate, included in the revised version.

2.0 Project Brief

2.1 Brief

(a) Each project will have an agreed written Brief setting out the scope of works and the Client'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 (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 to provide for this need.

(c) For Primary and Post-primary School projects, this brief is determined by the Planning and Building Unit [PBU], in agreement with the relevant School Authority as follows:

(i) The School Planning Section of the Planning and Building Unit [PBU] 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, the School Planning Section 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 Client for comments/ acceptance leading to agreed schedule/s between the Client and the School Planning Section.

(vi) The Schedule of Residual Accommodation plus the 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 the Planning and Building Unit before the appointment of Design Consultants, and before commencement of Stage 1 PRELIMINARY DESIGN.

3.0 Design Philosophy

3.1 Design Aims

(a) The school should be lively and welcoming; a suitable place for intellectual, creative, physical and social activity; 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 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 TGD-001 to TGD-006 Mechanical & Electrical Building Services Guidelines and the section on Buildability and durability in TGD-021 Construction Standards for Schools.

(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 the Design Team members.

3.1 Design Philosophy (continued)

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 process of Design can therefore be structured around a number of key components. These guidelines and the suite of Design Guidance Documents for Primary and Post-primary schools deals 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**
- **Its character and form**
- **Access, circulation and way-finding**
- **The efficiency and flexibility of the layout**
- **Capacity for expansion**
- **Health & Safety**
- **The building quality and durability**
- **Structural integrity**
- **Security**
- **Energy efficiency and use**
- **Mechanical & Electrical Building Services Engineering**
- **Sustainability**
- **The external layout and landscaping.**

3.4 Architectural Design

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 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.

3.0 Design Philosophy (continued)

3.4 Architectural Design (continued)

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. 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.

(d) The proposed school design should ensure that all areas are fully accessible by all users. See Section 8.0 Universal Access.

(e) 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.

(f) All teaching areas (with the exception of the PE Hall at Post-primary Level), 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 900 mm above finished floor level. Window head heights for teaching spaces should be a minimum of 2400 mm above finished floor level for the main windows to maximise daylight penetration.

3.5 Structural Design

(a) Considerations should be given to the “build-ability” of schools (i.e. simplicity and economy of construction). Innovative forms or methods of construction may be considered, but the designer 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 TGD-021 Construction Standards for Schools.

3.0 Design Philosophy (continued)

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. See Section 4.4 Passive Energy. 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 be where possible non-toxic and non-polluting from certified sustainable sources.

3.7 Mechanical Building Services Engineering Design Philosophy

(a) The Mechanical Building Services Engineering installation comprises heating, ventilation, water, 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 TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines .

3.8 Electrical Building Services Engineering Design Philosophy

(a) The Electrical Building Services Engineering installation comprises electrical supply, Electricity Centre and main distribution, power distribution services, lighting services, communication services, transport services and protective services.

(b) The Electrical Services Design Philosophy and further detailed Electrical Services Design guidance is described in TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines.

4.0 The Built Environment

4.1 General

(a) Detailed requirements for most elements of the Built Environment are described in TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines. Further information on Air-tightness is provided in 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 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 and passive solar strategies, and day-lighting.

4.3 Thermal Performance

(a) Thermal insulation standards shall meet or exceed the prevailing 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.

4.4 Passive 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 day-light and minimising heat losses while maintaining comfort conditions.

4.5 Natural Ventilation

(a) Ventilation where possible should be natural ventilation by means of permanent wall vents and windows with opening sections. 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.

(b) The ventilation area provided through permanent vents and opening sashes shall exceed the current building regulation guidelines, and shall be designed to suit the class environment having regard to the high levels of occupancy generally.

(c) Window design must ensure that adequate natural ventilation is provided without draughts with 1/3rd of the minimum required opening sections above the occupancy zone and 2/3rd at lower level. The operation of the upper sections must be independent of the lower opening sections. Full height side hung opening sections are to be avoided.

Continued overleaf

4.5 Natural Ventilation (continued)

(d) The effect of restrictors on the installed window opening area must be considered at design stage to ensure adequate ventilation as outlined above.

(e) 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. See also 4.6 Natural Day-lighting below.

(f) Toilets should be ventilated by natural permanent ventilation means. Where this is not possible, changing areas and toilets shall be mechanically ventilated. A permanent natural vent to the exterior, either directly or ducted should be provided in addition to any operable window.

4.6 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 associated guidance documents. (Daylight calculations are primarily in the remit of the Building Services Consultant Engineer in consultation with the Architect.)

(b) 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 with average day-lighting factor in the range of 4.5 to 5.5%.

(c) 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 and associated circulation space and computer 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.

(d) Windows in Computer rooms shall be designed as “wide and low” rather than “narrow and high” to minimise the area of bright, visible sky.

(e) For more information on window geometry See 3.4 Architectural Design.

4.7 Acoustic Performance

(a) Acoustic performance is a primary determinant of a quality learning environment and the design should be capable of meeting or exceeding this essential functional requirement.

(b) 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.

(c) Acoustic privacy is needed in areas, such as principals’ and deputy principals’ offices, pastoral offices in Post-primary, and multi-purpose rooms in Primary, where matters of a confidential nature may be discussed.

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4.7 Acoustic Performance (continued)

(d) 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 Consultant Engineer to ensure that the building services installation does not infringe on required standards.

(e) A minimum noise reduction of 45 dB is required between teaching spaces, and between teaching spaces and other noise generating areas.

(f) For noise reduction requirements to particular rooms refer to the TGD-022 Primary School Design Guidelines or TGD-023 Post-primary School Design Guidelines as applicable. See also TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines.

4.8 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 buildings and extensions in excess of 1000 m2.

(c) Whether there is a requirement for air-tightness testing or not, all 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 5m3/h/m2 of measured envelope area at a test pressure of 50Pa should be achieved [Buildings over 1000 m2]. 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 above ceiling level.)

(e) The air seal boundary can be made up of many components for example a Radon 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 1000 m2] 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 TGD-021 Construction Standards for Schools.

5.0 Health & Safety

5.1 Statutory Regulations

(a) All Designers 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 Designers are required to comply in full with the Safety, Health & Welfare at Work Act, 2005 and the Safety, Health & Welfare at Work (Construction) Regulations 2006.

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 building to the Client.

(b) In particular all designers must both individually and collectively identify, at all stages of the design process, any hazards that the design may present during construction and 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 Safety and Health Plan.

(e) While all designers must co-operate with both the PSDP and the Project Supervisor Construction Stage [PSCS], the primary responsibility for safety in design rests with each designer individually and collectively.

(f) The Safety, Health & Welfare at Work Act, 2005 requires designers to ensure that the project is capable of being constructed to be safe, 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 designer, the Design Team 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.

6.0 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, 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 TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines.

7.0 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, builders rubble, etc.) can be retained on site as part of the overall landscape arrangement.

8.0 Universal Access

8.1 Design Philosophy

(a) All new schools and school extensions 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 current Building Regulations. The criteria set out in the current publications of the National Disability Authority should be considered in all cases.

8.2 External

(a) Provision should be made for disabled access from the site perimeter to the school, 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 Building Regulations and the National Disability Authority guidelines.

8.3 Internal

(a) All new school buildings and new extensions 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 prevailing 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) At ground floor level a universal access sanitary suite shall be provided and shall include a universal access shower and base. The floor area should be sufficient to allow for a changing bench and a mobile hoist if required. This should be a multi-user suite available to all. In a Post-primary school a similar additional sanitary suite (with changing bench and mobile hoist if required) shall be provided off the P.E. Hall foyer.

(d) At least one Universal access WC only (not shower) shall also be provided at each floor level, opening off the main circulation near the lift. Universal Access W.C.s should be so located as to facilitate access from the main entrance as well as minimise the travel distances within the building.

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 350m2 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.

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8.5 **Lifts** (continued)

(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. Traditionally lift usage profiles for schools are low, and platform type lifts with powered doors address many of the above requirements and their use is recommended as a standard solution.

(e) For further details see TGD-002 to TGD-006 Mechanical & Electrical Building Services Guidelines.

9.0 Security

9.1 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 Client 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 9.3 CCTV.

9.2 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 at design stage 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 with audio/intercom units fitted to the main front entrance and a natural view maintained between the reception office and the front door.

(e) External doors should be robust and should be capable of withstanding physical assault.

Continued overleaf

9.0 Security (continued)

9.2 **Building Security** (continued)

(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 the Department's TGD-002 to TGD-006 Mechanical & Electrical Building Services Guidelines.

(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.

9.3 **CCTV**

(a) A Closed Circuit Television System shall be provided in all new schools as a means of monitoring and recording the main school entrances. For further details see TGD-001 to TGD-006 Mechanical & Electrical Building Services Guidelines.

(b) The CCTV system installation shall not be covert but rather be visible.

(c) Systems shall be designed so that the specification is open enough to allow any competent CCTV installer 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 system is not deemed sufficient for a particular school additional coverage may be considered. See TGD-001 to TGD-006 Mechanical & Electrical Building Services Guidelines for relevant procedure.

(e) If a school wishes to extend the basic system 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 Department's policy to fund internal CCTV systems.

10.0 External Circulation

10.1 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.

10.2 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 disability 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 be clearly signed so that visitors are in no doubt as to how they must proceed and where they should go.

(f) Designers must ensure that all current regulations relating to Safety, Health and Welfare at Work is taken into account in the layout of roads and paths.

10.3 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 and covered cycle parking facilities should be provided if requested by the individual schools. If bicycle racks are provided, these should be adjacent to the student entrances.

Continued Overleaf

10.0 External Circulation (continued)

10.4 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 should be separated from Pupil/student access.

(b) The design should facilitate access for emergency vehicles while minimising the length of on site roads and shall be in accordance with current 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 were possible for future expansion of parking areas. Parking provision should be as stated in the brief but subject to current planning requirements.

10.5 Service access

(a) Vehicular access to Plant 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.

11.0 Internal Layout

11.1 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) 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.

11.2 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 Plant Rooms should also take account of the likelihood of future expansion.

11.3 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.

(c) Once in the secure entrance lobby to the school building the visitor should be able to communicate with reception without difficulty and without access to the rest of the school building. See also 9.2 Building Security

(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 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.

11.4 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.

Continued overleaf

11.0 Internal Layout (continued)

11.4 Internal Circulation (continued)

(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 at Primary Level 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 the case of Post-primary and 1.8m for Primary.

(d) If lockers are located in the circulation area, space should be allowed in front of the lockers for ease of access to the lockers, and to allow some congregation without blocking circulation. A overall recess of 0.9m is recommended. The preferred arrangement at Post-primary level is that lockers be located along circulation routes. See also TGD-022 Primary School Design Guidelines or TGD-023 Post-primary School Design Guidelines as applicable.

(e) The area of internal walls will occupy an area equivalent to at least 3% of the net area, and up to 6% if the walls are wider to allow for acoustic separation and/or to provide thermal mass. Where less than 6% of the net area is used for internal divisions, the unused area can be allocated to circulation.

11.5 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:

- Areas > 25m^2 3.00m; (3.15m for Post-primary)
- Areas < 25m^2 (excluding Plant-rooms) 2.7m.

(d) In addition to the above requirements designers should refer to TGD-022 Primary School Design Guidelines or TGD-023 Post-primary School Design Guidelines as applicable for minimum heights for specific rooms.

11.6 Emergency exits

(a) All emergency exits should be well signposted and shall be in accordance with current Building Regulations.

(b) All stairs should have a dual function of emergency circulation and providing access to accommodation in order to optimise floor area.

Continued overleaf

11.7 Plant room locations

(a) Central Plant areas should be located so as to provide for economic distribution of services. Heating centre plant room and switch rooms should not be located at the outer extremities of the building or as an annex.

(b) Refer to TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines for more detailed guidance on Plant room design and location.

11.8 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, 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 build, 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 TGD-002 to 006 Mechanical & Electrical Building Services Engineering Guidelines.

12.0 External Landscaping

12.1 Landscape Design

(a) See also Section 9.0 Security

(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 paths 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 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.

(i) 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.

12.2 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 12.1g above

Continued overleaf

12.2 **Social Spaces** (continued)

Soft areas

(c) 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 [see also 8.2 Universal Access].

(d) 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.

Hard areas

(e) To complement the soft informal and social areas, the design may include hard-surfaced play spaces and sheltered space for socialising and for the encouragement of active, 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.

(f) Appropriate site furniture, such as seating, to accommodate a range of pupil numbers, should be provided.

(g) Large areas of hard landscaping should be avoided.

13.0 % Art Scheme

13.1 **% 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 % 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, designers 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 Department of Education and Science web-site at www.education.ie and the Public Art: Per Cent for Art Scheme-General National Guidelines -2004.

[END]