

West Lothian Council: Property Services

EMPLOYER'S DESIGN REQUIREMENTS

Revision	By Whom	Notes
February 2025	NS	<ul style="list-style-type: none"> • CCTV specification change
September 2024	NS	<ul style="list-style-type: none"> • Cupboards containing Distribution Boards or other electrical equipment. • Portable Appliance Testing
June 2024	DH	<ul style="list-style-type: none"> • Adding roof to bin cage to prevent fly tipping
January 2024	NJS	<ul style="list-style-type: none"> • Lightning and surge protection • Photovoltaic System Appendix 3
November 2023	NJS	<ul style="list-style-type: none"> • Photovoltaic System Appendix 3
May 2023	NJS	<ul style="list-style-type: none"> • Photovoltaic System Appendix 3 • Lighting fixings etc • Fire alarms/ CCTV / ARC
January 2023	LMCG	<ul style="list-style-type: none"> • Align Prohibited items with Legionella Policy and Management Plan • Additions to Hot & Cold water • Additions to Mechanical Heating
September 2022	ARM	<ul style="list-style-type: none"> • Additional notes for Hot & Cold Water • Additional notes for Mechanical Heating • Refrigerant gas notes updated • RCD requirements updated • Lighting marshalling box requirements • Fire safety review • Prohibited category added • Cold water boosters • Glass wall panels and maximum sizes • Render colours • Gap below fencing
Jan 2021	ARM	Toilet Design Guide added as Appendix 2
Dec 2020	PLT	7.06 General safe access added. 16.07 Induction loops added.
Jun 2020	ARM	9.01 Reference made to the Electrical Accessory Placement Guide 13.05 Underfloor guidance updated 13.11 ASHP/GSHP guidance updated 15.09 Diffusor guide updated 15.10 Solar Time Switch added 18.0 Management of Asbestos in Construction Works
July 2019	ARM	M&E Sections updated.
Jul 2019	PLT & MM	1.03 Added. Link to new Appendix 1 Fire Signage. 5.05 Added. Fly screens to Nursery Kitchens. 8.04 Added. Floor paint. 2.02, 8.01, 8.02, 9.01, 9.06, 9.10 & 16.02 updated and 9.12 added.

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December 2018	ARM	M&E Sections updated by. Format changed, 3.03 & 5.01 updated and 9.10 & 10.02 added by FH/ PLT.
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Council Standard

- **Agreed council wide standard. Must be complied with.**

Design Considerations must include:

- **Designers must consider the points in each section and aim to include them within the final designs.**

Avoid

- **Designers must consider the points in each section and aim to avoid them within the final designs.**

Prohibited

- **Must not be used**

Where Designers propose to deviate from the above list, the it must be included within the Project Derogation Schedule and approved by the Property Maintenance & Planned Improvement Manager or the Property Services Manager.

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1.00	General	
1.01	Provision of Skips	<p>Council Standard:</p> <p>All skips are to be sited at least 10m from building. Skips should either be lockable or moved and rubbish disposed of on a daily basis, to eliminate/reduce willful fire raising.</p>
1.02	Provision of Scaffold	<p>Council Standard:</p> <p>Scaffold must fully enclosed by hoarding or secure fencing. Main entrance and all final exits to be maintained and must be fully boarded. Access to ground via stair/ladder to be removed or access restricted at the end of each working day. All scaffolding must be tagged with certificate.</p> <p>To prevent unauthorized access and maintain fire exits.</p>
1.03	Fire Safety	<p>Council Standard:</p> <p>All construction works must comply with Fire (Scotland) Act 2005 and Fire (Scotland) regulations 2006</p> <p>All work, where required, to be designed to the mandatory standards under the Building (Scotland) Regulations. Guidance on the design and construction of new buildings is contained in the Scottish Building Standards Technical Handbook for Non-Domestic Buildings</p> <p>Where Practical Fire Safety Standards have been issued by the Scottish Government, then these become the benchmark standard required – even if this is in excess of the current Scottish Building Standards Technical Handbook for Non-Domestic Buildings</p> <p>It is possible for a standard higher than that required by Building Regulations to be necessary and appropriate as a consequence of a fire safety risk assessment.</p> <p>The benchmark standards noted below must be the standard adopted.</p> <p>Benchmark standards applied can be sourced from specific technical guidance at www.gov.scot/publications/?term=practical%20fire%20safety%20guidance&page=1</p> <p>Practical fire safety guidance for:</p> <ul style="list-style-type: none"> • Entertainment & assembly • Education & day care for children • Care homes • Premises with sleeping accommodation • Offices, shops & similar premises • Factories and storage premises • Transport premises • Healthcare • Evacuation of disabled person from buildings <p>Refer to Appendix 1 for signage requirements.</p>

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1.04	Cupboards containing Distribution Boards or other electrical equipment.	<p>Council Standard:</p> <p>Design should also allow for safe access for maintenance, repair and replacement of services equipment.</p> <p>Prohibited:</p> <p>Dedicated services cupboards must not to be used for storage.</p> <p>(If not practical, prevent storage within 1.6 metres of electrical equipment by providing a non-combustible barrier. Combustible materials shall NOT be stored within the cupboard.)</p>
1.05	Fall arrest systems.	<p>Design Consideration Must Include:</p> <p>Buildings are to be designed to minimise the requirement to install fall arrest systems. (Also refer to roof/ gutter/ window design).</p>
1.06	Bin Stores	<p>Council Standard:</p> <p>In compliance with the Council's insurer's requirements, all bin stores must be located a minimum of 10m from the face of the building, and be enclosed and secured with a metal lockable door/lid.</p> <p>Note enclosure required to prevent fly tipping.</p>
1.07	Free standing walls	<p>Prohibited:</p> <p>Free standing walls.</p> <p>(Where free-standing walls are unavoidable as part of the project brief, they must be properly designed and be of robust construction in accordance with the relevant Building and Technical Standards. Proposals shall be submitted to WLC for design review.)</p>
2.00	External render/ cladding/ soffits/ fascia	
2.01	External finishes	<p>Design Considerations Must Include:</p> <p>Robust low maintenance finishes should be specified.</p> <p>Avoid:</p> <ul style="list-style-type: none"> • All cladding systems with concealed fixings, particularly timber framing etc. as condition cannot be adequately monitored in the long term. <p>Prohibited:</p> <ul style="list-style-type: none"> • High level exposed timber finishes which will require regular treatment or painting. • Smooth render finishes. • Light colour render that quickly show scuff/ball marks • Plastic external air brick vents

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2.02	Metal Composite Panels	<p>Design Considerations Must Include:</p> <p>Consult WLC Risk and Insurance Team for fire rating and requirements.</p> <p>Avoid:</p> <ul style="list-style-type: none"> • All cladding systems with concealed fixings, particularly timber framing etc. as condition cannot be adequately monitored in the long term. <p>Prohibited:</p> <ul style="list-style-type: none"> • Aluminium Composite Material (ACM) and PUR composite panels.
3.00	Roofing	
3.01	Pitched Roofing	<p>Design Considerations Must Include:</p> <p>Minimize roof penetrations to avoid water ingress.</p> <p>Careful consideration to be given to roof drainage.</p> <p>Avoid:</p> <ul style="list-style-type: none"> • Skylights, where possible <p>Prohibited:</p> <ul style="list-style-type: none"> • Internal rainwater drainage • Valley gutters • Parapet walls • Concealed gutters • Wet verge
3.02	Single layer polymeric sheet roof coverings	<p>Prohibited:</p> <ul style="list-style-type: none"> • Single ply roofing systems. • Sedum roofs
3.03	Flat roofing (Felt)	<p>Design Considerations Must Include:</p> <p>Flat roofing should be a contractor designed element based on the following requirements:</p> <ul style="list-style-type: none"> • To be constructed of 3 layer built-up felt as standard. • Minimise roof penetrations for the avoidance of water ingress. • Careful consideration to be given to how water will discharge from the roof. • Avoid skylights where appropriate on all new roof coverings. • System to have 20 year warranty <u>AND</u> arrangements in place that comply with Standing Orders to deal with leaks that are not covered by warranty. • Bauder System or equivalent. • Flat roof system should be bitumen felt system with a minimum 20 year manufacturers guarantee covering product failure due to defective manufacture, defective design or defective installation (contractors workmanship guarantee would not be acceptable).

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		<ul style="list-style-type: none"> • The proposed manufacturer of the roof system must have carried out a roof inspection and technical assessment as part of the tender submission and provide evidence that the proposed specification will work. • The insulation should meet the minimum (WLC Green Design Guidelines aims to exceed the standard by at least 10% and where possible 15%) thermal performance based on a defined thickness of insulation. Deviation from the thickness of insulation would not be acceptable. • Flat roof system manufacture to inspect the works on a weekly basis and submit weekly reports. • Report for information should follow a set procedure for conducting routine inspections, to record and highlight any issues requiring action or provide useful feedback. Record relevant information and provide a report that is both easy to read and electronically archive. This should represent a snapshot of what was found on the day of inspection and any important action points or recommendations noted within this report and copied to all relevant parties. Photos to be included where relevant. • The manufacturer should detail any ongoing requirements of the guarantee e.g. annual inspection and detail any costs associated with this. • The manufacturer should provide details of the Service Level Agreement are in place for dealing with water penetration in the future as part of the guarantee. <p>Minimize roof penetrations to avoid water ingress.</p> <p>Careful consideration to be given to roof drainage.</p> <p>Hoppers/Outlets/Overflows to be visible from the ground.</p> <p>Prohibited:</p> <ul style="list-style-type: none"> • Internal rainwater drainage • Valley gutters • Parapet walls • Concealed gutters • Wet verge
4.00	Linings/ Sheathing/ Dry partitioning	
4.01	Panel cubicles/ duct and wall linings/ screens	Refer to Appendix 2 - Toilet Design Guide
4.02	Demountable suspended ceilings	<p>All ceiling tiles to be clipped and access panels marked.</p> <p>Avoid:</p> <ul style="list-style-type: none"> • Demountable suspended ceiling tiles in areas prone to vandalism and where drafts and wind uplift could cause the tiles to become dislodged.
4.03	Internal Walls	Design Considerations Must Include:

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		<p>Robust specification. Either block/brick with plaster finish or if stud construction should be impact resistant plasterboard.</p> <p>Avoid:</p> <ul style="list-style-type: none"> • Timber linings (fire risk). To be none combustible, Minimum Class A1 • Vents (Where this is not practical vents must be intumescent to prevent passage to fire and smoke)
5.00	Windows/ Doors	
5.01	External windows	<p>Design Considerations Must Include:</p> <p>Comply with the relevant British Standards. All glazing must clearly display the relevant BSI Kitemark. All windows are to be fitted with lockable restrictors.</p> <p>To be constructed from materials that requires minimal maintenance/ painting.</p> <p>Windows must be designed to suit the building use, with the end user in mind. The type of window opening mechanism and ironmongery must be fit for purpose.</p> <p>Ensure that the window design & specification is agreed with Maintenance Team Principal.</p> <p>Glazing details: Insulating glass units incorporating low emissivity glass and air filled cavity. Laminated glass inside toughened outside. Minimum U Value for window units to be in accordance with current Scottish Building Standards or better.</p> <p>Double glazing refer 6.01 Preferential opening (Top Hung) UPVC reinforced or Aluminum or Timber clad windows only</p> <p>Avoid:</p> <ul style="list-style-type: none"> • Avoid timber windows unless clad externally in aluminum or other no maintenance material. • Large glazing units greater than 1.5m² <p>Prohibited:</p> <ul style="list-style-type: none"> • Tilt and turn windows. • Electro mechanically operated windows • Opaque or colored glass external wall panels • Fixed windows with walling internally i.e. window visible from the outside but not from the inside.
5.02	External doors (not fire doors)	<p>Design Considerations Must Include:</p> <p>To be constructed from material that requires minimal maintenance/painting.</p>

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		<p>Should be constructed to the relevant BS with all Kitemark and other required compliance standards clearly marked. All doors must include 'safe hinge' design or finger safe gaskets integral to the door to remove risk of finger trapping.</p> <p>Vision panels to be minimum size to comply with regulations Glazing Refer to 6.01</p> <p>Minimise Glazing aperture at access doors</p> <p>Avoid: Glazing in fire exit doors</p>
5.03	Internal Doors	<p>Design Considerations Must Include:</p> <p>Should be solid core, pre-finished door sets and easy-to-clean with low maintenance. All glazing must clearly display the relevant BSI Kitemark. Vision panels to be minimum size to comply with regulations. All doors must include 'safe hinge' design or finger safe gaskets integral to the door to remove risk of finger trapping.</p> <p>Glazing Refer to 6.02 Refer to 9.10 for Classroom door ironmongery. Refer to 9.12 for Nursery door ironmongery.</p>
5.04	Roller shutters	<p>Design Considerations Must Include:</p> <p>Electro mechanically operated Powder coated</p> <p>Prohibited: Manually Operated roller shutters</p>
5.05	Fly Screens	<p>Council Standard: Nursery Kitchen external doors and windows must be fitted with fly screens.</p>
6.00	General glazing	
6.01	External glazing	<p>Council Standard:</p> <p>Insulating glass units incorporating low emissivity glass and air-filled cavity. Laminated glass inside toughened outside. Minimum U Value for window units to be in accordance with current Scottish Building Standards or better.</p>
6.02	Internal Glazing	<p>Design Considerations Must Include:</p> <p>Single glazed: Laminated glass (rated to door where required)</p>
7.00	Stairs/ Ladders/ walkways	
7.01	Metal stairs/ramps	<p>Design Considerations Must Include:</p>

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		Surfaces to be slip resistant. GRP anti-slip product to be installed where required (including metal access ramps).
7.02	Ladders/Walkways	<p>Design Considerations Must Include:</p> <p>Provision of loft ladder/generous sized access hatch; Header/expansion tanks sited close to hatch; permanent electric light situated close to hatch; boarded walkway provided to tank; easily removable covers.</p>
7.03	Ramps	<p>Design Considerations Must Include:</p> <p>Should be designed to prevent a buildup of debris under and around ramps.</p>
7.04	Timber decking	<p>Prohibited:</p> <p>Timber or composite decking must not be used.</p>
7.05	External Stairs/ Ladders/ walkways	<p>Avoid:</p> <p>Avoid the use of external stairs/ladders/walkways</p>
7.06	General access	<p>Design Considerations Must Include:</p> <p>Suitable walkways must be provided to allow safe access to plant and equipment i.e. water tanks smoke detectors etc... Walkways to be designed in accordance with BS EN ISO 14122.</p>
8.00	Surface finishes	
8.01	Flooring	<p>Design Considerations Must Include:</p> <p>Slip resistance required to suit conditions.</p> <p>Schools/Nursery Standard colours (Gerflor range or equivalent & approved):</p> <ul style="list-style-type: none"> • Main area OPTION 1: Taralay Impression Comfort 0373 Noma Ice with Taralay Impression Control 0520 Noma Black • Main area OPTION 2: Taralay Impression Comfort 0745 Nest Metal with Taralay Impression Control 0525 Modena • TOILET AREAS: Tarasafe Geo 3775 Crystalline.0 • ENTRANCE MAT: Forbo Coral Welcome 3201 Silver Shadow. <p>Prohibited:</p> <ul style="list-style-type: none"> • Installation of studded type vinyl/difficult to clean.
8.02	Painter work (Internal walls)	<p>Design Considerations Must Include:</p> <p>Preparation :</p> <ul style="list-style-type: none"> • Remove all staples, fill cracks. <p>Existing surface finishes:</p> <ul style="list-style-type: none"> • Ceilings – two coats of vinyl matt emulsion or acrylic eggshell. • Walls – Apply two coats acrylic eggshell. • Woodwork – Apply one undercoat and one coat gloss finish.

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		<p>New surface finishes:</p> <ul style="list-style-type: none"> • Ceilings – Apply base coats primer and two coats of vinyl matt emulsion or acrylic eggshell. • Walls – Apply base coat primer and two coats acrylic eggshell. 22 B 15 • Woodwork - Apply one coat oil primer, one undercoat and one coat gloss finish. <p>Robust/minimal maintenance required Type either vinyl silk or gloss suitable for location</p> <p>Standard colours only:</p> <ul style="list-style-type: none"> • INTERNAL WALLS - 22 B 15 (pearl grey) • INTERNAL SKIRTINGS, FACINGS, CILLS (etc) which are not laminate finish - Brilliant white • EXTERNAL FASCIAS, SOFFITS, RAINWATER GOODS - 22 B 17 Cumulus with accent colour (if required) 00 A 13 Condor. <p>Avoid:</p> <ul style="list-style-type: none"> • bold colours
8.03	Mat wells	<p>Prohibited:</p> <p>Installation of mat wells due to potential trip hazard/difficult to clean.</p>
8.04	Floor Paint	<p>Design Considerations Must Include:</p> <p>Ensure suitability of applied floor finishes for the relevant application by properly checking the manufacturer's instructions for the required slip resistance.</p> <p>Prohibited:</p> <p>In all areas other than plant rooms.</p>
9.00	General fixtures/ Furniture/ Equipment	
9.01	Domestic Kitchens fittings, furnishings and equipment	<p>Design Considerations Must Include:</p> <p>Ironmongery:</p> <ul style="list-style-type: none"> • 180° Hinges required. <p>Finishes:</p> <ul style="list-style-type: none"> • Solid core laminate required where there is a risk of moisture. • Standard contract range • Easy clean • Splashback to be from Altro Whiterock Chameleon range or equivalent <p>Standard colours only:</p> <ul style="list-style-type: none"> • Kitchen units gloss white • Worktops solid grade laminate colour B101 Banian Noir from Polyrey • Splashback colour may be chosen by client.

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		<p>All electrical accessories should be installed in accordance with the Electrical Accessory Placement Guide on CSToolkit.</p> <p>Avoid: Ceramic tiling Preformed worktop (schools only)</p>
9.02	Commercial catering fittings, furnishings and equipment	<p>Design Considerations Must Include:</p> <p>Exact requirements to be agreed with WLC FM/Maintenance teams</p>
9.03	Sanitary appliances and fittings	Refer to Appendix 2 - Toilet Design Guide
9.04	School toilets	Refer to Appendix 2 -Toilet Design Guide
9.05	Audio Visual Equipment	<p>Council Standard:</p> <p>Install Promethean ActivPanel, in lieu of SMARTBoards.</p>
9.06	Internal fire and safety signage systems	<p>Design Considerations Must Include:</p> <p>Fire Safety signage to be installed appropriate to risk Consult with WLC Maintenance/Term Maintenance Contractor schedule</p> <p>Where further guidance is required contact WLC Fire Officer. Refer Fire Safety signage in appendix 1.</p>
9.07	Portable firefighting systems	<p>Design Considerations Must Include:</p> <p>Firefighting equipment to be installed appropriate to risk Consult with WLC Maintenance/Term Maintenance Contractor schedule</p> <p>Where further guidance is required contact WLC Fire Officer.</p>
9.08	Permanent access and safety equipment	<p>Design Considerations Must Include:</p> <p>Design out where possible to minimize the amount of permanent access and safety equipment</p> <p>Consult with WLC Maintenance regarding suitability and maintenance regime.</p>
9.09	Blinds	<p>Design Considerations Must Include:</p> <p>Type, material and colour of blinds to be agreed with WLC Client/User group(s)/Maintenance Team.</p> <p>Prohibited: Vertical blinds.</p>
9.10	Ironmongery	<p>Council Standard:</p> <p>Classroom doors fitted with thumb-turn's to have Anti-barricade function (clutch cam key override).</p>

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		<p>In an emergency the key will override the thumb-turn if being held.</p> <p>Design Considerations Must Include:</p> <p>A turnbuckle, if fitted, should be of sufficient size and shape to allow simple and easy operation for all building users. The turnbuckle should be located a sufficient distance from the door jamb to avoid the door operator's hand conflicting with the intended door operation.</p>
9.11	Door/Window ironmongery	<p>Design Considerations Must include: Secure by design</p> <p>Prohibited: Electro mechanically operated windows</p>
9.12	Finger Guards	<p>Council Standard:</p> <p>ALL doors (Internal and External) to include 'safe hinge' design or finger safe gaskets integral to the door remove risk of finger trapping.</p> <p>Note: Finger guards also required to Nursery kitchen gates.</p>
10.00	Paving/ Planting/ Fencing/ Site furniture	
10.01	Fencing	<p>Council Standard:</p> <p>All fencing to be sited a minimum of 2m from any existing property or boundary fence/wall to reduce unauthorized climbing and to allow maintenance of the property fence or wall. All spike top fencing to be accompanied with warning signage displayed prominently at regular intervals.</p> <p>Security fencing either Galvanised/powder coated Palisade fencing with corrugated "D" section or V Mesh powder coated, minimum height 2400mm</p> <p>Boundary fencing to be Galvanised/powder coated weld mesh, maximum height 1800mm</p> <p>Internal fences to be Galvanised/powder coated weld mesh safe top/roll top</p> <p>All security fencing to be accompanied with warning signage displayed prominently at regular intervals.</p> <p>Gap below fencing/gates should not exceed 50mm (this follows H&S incidents where children have escaped from school under fences/gates.</p> <p>Avoid: Timber fencing (may be considered in rural settings)</p>
10.02	Timber decking	<p>Prohibited:</p> <p>Timber or composite decking must not be used.</p>

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11.00	Drainage disposal systems	
11.01	Rainwater goods	<p>Council Standard:</p> <p>Any new or alterations to existing rainwater outlets to incorporate leaf guards as standards.</p> <p>All rainwater gutters to be manufactured in aluminium where replacement of cast iron gutters above 1 storey. For 1 storey properties aluminium or uPVC (deep flow).</p> <p>Design Consideration Must Include:</p> <p>All rainwater pipes at low level/accessible to be manufactured in cast aluminium to prevent vandalism.</p>
12.00	Hot & Cold Water Systems	
12.01	General	<p>Council Standard:</p> <p>Potable water must be direct from a mains supply. Storage tanks for potable water supply are not acceptable.</p> <p>Design Considerations Must Include:</p> <p>Systems should be designed in accordance with the following principals:</p> <ul style="list-style-type: none"> • Minimize the requirement regular for maintenance or inspection. • High tech solutions that require specialist contactors to carry out maintenance should be avoided. • Availability of spares and replacement equipment should be taken into account. • Maximize potential economies of scale with other plant and equipment elsewhere in the buildings portfolio. • DHWS & CWS designed so that the most used outlets are located at the end of the distribution line. • Supply to any expansion vessels should be configured so that any dead leg formed can be flushed. <p>Where regular maintenance or inspection tasks are required to be carried out, sufficient space and safe access must be provided.</p> <p>Any alterations to our existing water systems should be updated into the Water Log Book including schematic drawings.</p> <p>All new pipework should be disinfected & certified before use.</p> <p>Water systems should be designed in a way to reduce the amount of stored hot water. Consideration should be given to the use of plate heat exchangers to achieve this.</p>

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		<p>Avoid:</p> <p>Avoid plant, equipment or valves being located at high level that are subject to regular maintenance or inspection. The need to use access equipment such as ladders, tower scaffolds or cherry pickers for regular maintenance inspection or isolation must be avoided.</p> <p>No plant should be place on the roof. Where this is unavoidable, careful consideration is required of how the area could be re-roofed in the future without service disruption or costly access equipment.</p> <p>Designs should ensure that there is sufficient draw through from the system to reduce the risk of stagnant water on longer runs.</p> <p>Trace heating on pipework</p> <p>Boosted water systems should be avoided. Where they cannot be designed out, they must have a backup system to ensure that water can continue to be provided during a power cut in schools and care homes.</p> <p>Design package must include a complete water system schematic layout. Schematic layouts of the water system to be provided in advance of handover to allow Legionella Risk Assessment to be carried out.</p> <p>Prohibited:</p> <p>Flexible hoses or hose reel systems should not be used. (Where there is no choice but to install a flexible hose, example moveable sinks, then the flexi hose should be from the Excel Range or equivalent (WRAS) approved non EPD with Cross-linked polyethylene liner)</p> <p>Bib taps, Room humidifiers, cooling towers, spa baths or Ornamental water features are prohibited under the councils Legionella Policy. A business case exemption will be required to be signed off by the Depute Chief Executive prior to installation if they are proposed.</p>
12.02	DHWS and CWS services pipework	<p>Design Considerations Must Include:</p> <p>Fittings to be non - manipulative compression or integral solder ring type, above 50mm ø fittings are to be Hard Soldered (brazed). All installations shall comply with ACOP L8 for the prevention of <i>legionella</i>. All fittings used must be WRAS approved.</p> <p>Press fit or push fit type fittings are not permitted. No mixed metals are permitted on same system. . Ensure/maintain earth path continuity where metallic and non-metallic pipes are present or are introduced within the same pipe run. The systems in compliance with ACOP L8 should ensure no dead legs within the systems either in new installations or modifications to existing.</p>

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		<p>BS EN 1057 copper pipe services.</p> <p>Hot Water Secondary returns shall be extended to furthest distribution point on each leg, with easy access to take temperature readings.</p> <p>All pipework in void areas must be insulated</p> <p>Boiling Water Dispensing Points Wall-mounted boiling water outlets only. Only to be installed where staff numbers justify the provision</p> <p>Hot Water cylinders 250liters & above should have a de-strat pump with isolating valves & a timer installed. If hot water cylinders are indirect then also install high & low level immersion heater as back up source. Provide Hot water secondary Spare bronze pump fixed adjacent to pump on wall</p> <p>Prohibited:</p> <p>The under-counter 'ZIP' type shall not be installed.</p> <p>Infra-red (or the like) electronically operated outlets are not to be installed.</p>
12.03	CWS Storage tanks	<p>Design Considerations Must Include:</p> <p>To be of GRP construction and pre-insulated as per ACOP L8 and HSG 274</p> <p>By - Law 30 compliance is required.</p> <p>If located in an attic space, walkway board from access point to & around tank provided.</p> <p>For sectional tanks, a minimum 5-year warranty should be provided.</p>
12.04	Hot Water Service TMVs	<p>Council Standard:</p> <p>Council Standard for TMV's: Horne with integrated isolation valves.</p> <p>Design Considerations Must Include:</p> <p>Secondary returns shall be as close as possible to outlet; not in ceiling spaces etc.</p> <p>TMV's to be installed as close as possible to outlet and no more than 2 m away with easy access for servicing</p> <p>No more than two sinks fed from one TMV) and no more than 2 m away from outlet with easy access for servicing</p>
12.05	Percussion or spray taps	<p>Design Considerations Must Include:</p> <p>Provide child friendly taps (soft touch taps) where facilities are to be used by younger children.</p>

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		<p>Specify non-Concussive taps taking due cognisance of available water pressure. Do not specify units out of pressure range.</p> <p>Prohibited:</p> <p>Spray taps must not be used</p> <p>Infra-red operated taps etc. these are not to be specified.</p>
12.06	Drinking Water outlets	<p>Design Considerations Must Include:</p> <p>Must be connected directly to Mains Cold Water supply.</p> <p>Prohibited:</p> <p>Drinking water outlets not to be located in toilet areas.</p>
12.07	Direct fired Gas and Instantaneous Electric Hot Water Heaters	<p>Design Considerations Must Include:</p> <p>Must be able of achieving 50deg from an ambient temperature of 6deg and be able to be regulated for temperature.</p> <p>Prohibited:</p> <p>Zip hydro taps etc. are not to be specified.</p> <p>Water heaters are not to be located within suspended ceiling voids.</p>
12.08	Gas in in Home Economics or Science rooms, staff rooms etc.	<p>Council Standard:</p> <p>Council Standard for Gas Detection Systems: Flamefast Gas Guard Mk 1 & 2.</p> <p>Design Considerations Must Include:</p> <p>'Gas Guard' System To be provided in School laboratories, domestic science rooms, workshops, kitchens and other areas (except Boiler Houses) with a gas supply.</p> <p>The system shall pressurise the gas pipework then perform an integrity check to ensure that no downstream outlets or appliances have been left open/on.</p> <p>The unit shall provide suitable interfaces for Gas Sensors and CO₂ Monitors. Upon receiving a fault signal from any external devices, the system shall ensure that the gas supply is isolated to prevent any potential issues.</p>
12.09	Sprinkler Systems	<p>Design Considerations Must Include:</p> <p>Sprinkler Tanks to be GRP construction where system cannot be fed from mains.</p> <p>Prohibited:</p>

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		Galvanized steel with liners are not acceptable.
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13.00	Mechanical Heating (T)	
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13.01	General	<p>Design Considerations Must Include: Systems should be designed in accordance with the following principals:</p> <ul style="list-style-type: none"> • Minimize the requirement regular for maintenance or inspection. • High tech solutions that require specialist contactors to carry out maintenance should be avoided. • Availability of spares and replacement equipment should be taken into account. • Maximize potential economies of scale with other plant and equipment elsewhere in the buildings portfolio. <p>Where regular maintenance or inspection tasks are required to be carried out, sufficient space and safe access must be provided.</p> <p>Consideration must be given to the creation of zones within systems for better energy conservation.</p> <p>All openings made in walls, ceilings and floors for the passage of cables or ducts should be adequately ‘Fire Stopped’ with suitable fire resisting materials that will reinstate the fire resistance and prevent the passage of smoke through the wall, ceiling or floor.</p> <p>Main plant rooms being situated above occupied spaces</p> <p>Where gas is used Provide schematic drawing of system & display</p> <p>Avoid:</p> <p>No plant should be place on the roof. Where this is unavoidable, careful consideration is required of how the area can be re-roofed in the future without service disruption or costly access equipment.</p> <p>Avoid plant, equipment or valves being located at high level that are subject to regular maintenance or inspection. The need to use access equipment such as ladders, tower scaffolds or cherry pickers for regular maintenance inspection or isolation must be avoided.</p> <p>Prohibited:</p> <p>Pipework distributed within walls.</p>
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13.02	Heating pipework - exposed services	<p>Design Considerations Must Include:</p> <p>In all pipework systems both steel and copper Earth continuity path must be maintained. Special care at rubber expansion bellows or where plastic pipe has been used.</p> <p>Pipework up to 50mm diameter to be screwed and socketed. Above 50mm diameter to be welded. Pipe to be a minimum of 'medium' grade mild steel.</p>
13.03	Heating pipework - underground or in external ducts	<p>Design Considerations Must Include:</p> <p>As above but pipework and fittings to be heavyweight mild steel BS1387/EN10255</p> <p>Where an auto airier is installed a separate isolation valve should also be installed</p> <p>Prohibited:</p> <p>No Press-fit type pipework or fittings are acceptable.</p> <p>No mixed metals allowed on same system, e.g. copper and steel.</p>
13.04	Vents, Cold Feeds and Overflows	<p>Design Considerations Must Include:</p> <p>To be galvanised steel screwed and socketed.</p>
13.05	Underfloor and Trench Heating	<p>Avoid:</p> <p>Underfloor or Trench heating must not be used (unless is exceptional circumstances as outlined below)</p> <p>Underfloor heating may be the only viable solution in some circumstances.</p> <p>(Where underfloor heating is approved, consideration must be given to mitigating the fact that underfloor heating system are slow to react and may require 24 hours to reach temperature after a failure. This can include ensuring that there are dedicated electrical circuits that have sufficient capacity to cope with achieving heating set points if temporary electrical heating was provided e.g. electric convector heater</p> <p>Consideration also must be given to the future flexibility and usage of the building by including safe floor fixing areas. In large rooms consider installing additional circuits to help with reconfiguration of the room in the future)</p>
13.06	Radiators	<p>Design Considerations Must Include:</p> <p>To have four connections TBOE complete with nickel plated plugs and vents with high quality EPDM "O" rings as standard. Maximum test pressure should be 152 psi (10.5bar) and maximum working pressure 116psi (8bar) finished in a two coat RAL paint finish.</p>

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		<p>LSTs mandatory for Early Years, Nurseries, Disabled Toilets and Care Homes.</p> <p>All radiators to be fitted with TRVs where practical.</p> <p>Cast Iron acceptable to meet requirements for historically listed or buildings of architectural interest.</p> <p>Prohibited:</p> <p>No aluminium radiators permitted.</p>
13.07	Radiant Heating Panels	<p>Design Considerations Must Include:</p> <p>Design should ensure that valves can be accessed without the need for access equipment.</p> <p>Should not be directly above fixed furniture.</p> <p>Radiant Panel manufacture should be smooth & flat for easy cleaning.</p>
13.08	Fan Convectors	<p>Council Standard:</p> <p>Council standard for fan convectors: Biddle</p> <p>Design Considerations Must Include:</p> <p>Given Fan convectors require additional maintenance and include a higher degree of replacement parts, they should only be incorporated if passive emitters (i.e. radiators) cannot provide sufficient output.</p>
13.09	BMS systems	<p>Council Standard:</p> <p>Council Standard for BMS Systems: Honeywell Hawk with Arena NX software</p> <p>Design Considerations Must Include:</p> <p>Fully open protocol required. No managed or closed protocol systems allowed.</p> <p>Must be compatible with existing Council BMS systems.</p> <p>Systems should be graphically driven with a graphic representing each item of plant being controlled by the BMS including thermostats and sensors</p> <p>Local Surge protection should be fitted to electrical supplies serving BMS systems.</p> <p>Any proposed system must be able to be integrated and accessed/interrogated by the Council's BMS remote monitoring system.</p> <p>All access and platform passwords must be provided.</p>

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13.10	Boilers	<p>Design Considerations Must Include:</p> <p>Condensing and High Efficiency condensing boilers must be used. Manufacturers providing 10 year warranty should be specified.</p> <p>Where practical a minimum of two boilers per system should be considered. This can offset total boiler failure. i.e. 2 boilers, each sized @ 66% load, 3 Boilers each sized @ 50% load etc.</p> <p>Boilers should be rotated through the BMS for lead/ lag and should be capable of modulation.</p>
13.11	Air Source Heat Pumps	<p>Council Standard:</p> <p>Where VRV/VRF systems are used near sleeping accommodation a Refrigerant Detection System should be provided.</p> <p>Design Considerations Must Include:</p> <p>These should be manufactured to specifically cope with the UK's wet air winter conditions.</p> <p>Minimum 5-year warranty provided</p> <p>Avoid:</p> <p>Air Source systems should only be used in heating applications and not for hot water services.</p>
13.11	Ground Source/Air Source Heat Pumps	<p>Design Considerations Must Include:</p> <p>The hierarchy of design should be:</p> <ol style="list-style-type: none"> 1. Extend existing heating system 2. Ground source heat pumps 3. Air source heat pumps. <p>These should be manufactured to specifically cope with the UK's wet air winter conditions.</p> <p>Refrigerant types should be those noted in the FGas regulations with no current phase out date.</p> <p>New heat Pumps should have a minimum of 5 years manufacturer warranty.</p> <p>Where VRV/VRF systems are used near sleeping accommodation a Refrigerant Detection System must be provided.</p>

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		<p>Attention is drawn to the fact that underfloor heating must not be used except in exceptional circumstances. As a result, the Ground/Air Source heating system has to be designed to operate with appropriately sized radiators/emitters.</p> <p>In order to mitigate potential unreliability, consideration must be given to how the building will be heated if the Ground/Air Source Heating system has failed. This can include:</p> <ul style="list-style-type: none"> • Heat Pumps should be sized to offer a degree of spare capacity in the event of system failure (such as 2 units providing 66% system load each) • ensuring that there are dedicated electrical circuits that have sufficient capacity to cope with achieving heating set points if temporary electrical heating was provided or ensuring where practical buffer tanks with immersion heaters are included to cope as a back up
13.12	CHP	<p>Design Considerations Must Include:</p> <p>Careful calculation of the base load is essential to ensuring maximum benefit of CHP.</p> <p>CHP to be the 'lead' plant in boiler/CHP control sequence.</p> <p>Only manufacturers providing at least 3 year warranty should be specified.</p> <p>Whole-life costing shall be taken into due consideration in the choice of CHP system.</p> <p>Open protocol controls are mandatory, closed or managed protocol controls shall not be installed.</p>
13.13	Pumps	<p>Design Considerations Must Include:</p> <p>Twin headed, Variable Speed inverter driven.</p> <p>Allow for auto rotation through BMS.</p>
13.14	Booster Sets	<p>Council Standard:</p> <p>Boosted water systems must have a backup system to ensure that water can continue to be provided during a power cut in schools and care homes.</p> <p>Design Considerations Must Include:</p> <p>Provide packaged units with variable speed control with a minimum of 3No pumps each rated at 50% of the total design flow at design head. Each pump shall be provided with integral frequency converters. The booster sets shall be supplied with its own control panel and pressure vessel which shall all be mounted on a common skid unit.</p> <p>Booster sets must have dry run protection and auto reset following power disruption.</p>

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14.00	Ventilation & Air Conditioning Systems	
14.01	General	<p>Design Considerations Must Include:</p> <p>Systems should be designed in accordance with the following principals:</p> <ul style="list-style-type: none"> • Minimize the requirement regular for maintenance or inspection. • High tech solutions that require specialist contactors to carry out maintenance should be avoided. • Availability of spares and replacement equipment should be taken into account. • Maximize potential economies of scale with other plant and equipment elsewhere in the buildings portfolio. <p>Where regular maintenance or inspection tasks are required to be carried out, sufficient space and safe access must be provided.</p> <p>Mechanical ventilation should only be provided to rooms recommended in CIBSE Design Guides.</p> <p>All openings made in walls, ceilings and floors for the passage of cables or ducts should be adequately 'Fire Stopped' with suitable fire resisting materials that will reinstate the fire resistance and prevent the passage of smoke through the wall, ceiling or floor.</p> <p>Ventilation provision to the plant rooms shall be provided preferably by natural means, supplying combustion air (high and low level) and general ventilation to address heat gains within the plant space.</p> <p>Provide sufficient ventilation for any gas meter rooms (high and low level) in accordance with Gas Safety Regulations.</p> <p>Avoid:</p> <p>Avoid plant, equipment or valves being located at high level that are subject to regular maintenance or inspection. The need to use access equipment such as ladders, tower scaffolds or cherry pickers for regular maintenance inspection or isolation must be avoided.</p> <p>No plant should be placed on the roof. Where this is unavoidable, careful consideration is required of how the area could be re-roofed in the future without service disruption or costly access equipment.</p> <p>Avoid the use of air conditioning (only to be used in areas with high heat gains such as server rooms).</p> <p>Where VRV/VRF systems are used near sleeping accommodation a Refrigerant Detection System should be provided.</p>

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		<p>Avoid condensate pipes discharging on to walkways, access routes and similar public rights of way as habitual moisture can form a slip hazard especially in freezing conditions. Pipe condensate discharges to nearest drain.</p> <p>Refrigerant gases that are being phased out</p>
14.02	All supply and extract ductwork systems including kitchens	<p>Design Considerations Must Include:</p> <p>Ensure all ductwork is capable of being cleaned as per Internal Cleanliness of Ventilation Systems Guide (TR19) by the British Engineering Services Association. Consideration must be given to the safe regular cleaning of ductwork and fans without the need for expensive access equipment.</p> <p>Ductwork systems must be designed in accordance with the latest version of Internal Cleanliness of Ventilation Systems (TR19) and Sheet Metal Ductwork (DW/144) by the British Engineering Services Association.</p> <p>Where natural air vents are to be specified with a damper then an air tight damper should be used (DIN EN1751 Class A) to prevent back draughts from cold winter air in winter entering occupied rooms</p> <p>Avoid:</p> <p>Fans located on roofs that do not have access for maintenance and cleaning.</p>
15.00	Electrical Services	
15.01	General	<p>Design Considerations Must Include:</p> <p>Systems should be designed in accordance with the following principles:</p> <ul style="list-style-type: none"> • Minimize the requirement regular for maintenance or inspection. • Availability of spares and replacement equipment should be taken into account. • Maximize potential economies of scale with other plant and equipment elsewhere in the buildings portfolio. <p>The Electrical Installation shall be designed, installed and tested all in accordance with the Current Edition of the IET (formerly IEE) Wiring Regulations.</p> <p>All openings made in walls, ceilings and floors for the passage of cables or ducts must be adequately 'Fire Stopped' with suitable fire resisting materials that will reinstate the fire resistance and prevent the passage of smoke through the wall, ceiling or floor.</p> <p>Where regular maintenance or inspection tasks are required to be carried out, sufficient space and safe access must be provided.</p> <p>Avoid:</p> <p>Avoid electrical services being located at high level that are subject to regular maintenance or inspection. The need to use access equipment such as ladders, tower scaffolds or cherry pickers for regular maintenance inspection or isolation must be avoided.</p>

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		<p>High tech or manufacturer bespoke solutions that require specialist contactors to carry out maintenance should be avoided.</p> <p>High tech solutions that require specialist contactors to carry out maintenance should be avoided.</p>
15.02	Supply Arrangements	<p>Council Standard:</p> <p>Supply to be 400/230V 50Hz from REC sized to suit load.</p> <p>Prohibited:</p> <p>The use of high voltage supplies is to be avoided as WLC has no suitably authorised personnel to operate or maintain them or any associated transformers or the like.</p>
15.03	Standby Generation	<p>Design Considerations Must Include:</p> <p>Requirement to be determined at an early stage in conjunction with the building user(s).</p> <p>Installation of changeover equipment once a building is in use is expensive and disruptive.</p>
15.04	Compatibility	
15.05	Maintainability	
15.06	Electrical Cabling	<p>Design Considerations Must Include:</p> <p>Installation shall generally be with single core cables in steel conduit or trunking. All cabling (for whatever purpose) shall be supported on tray or basket or contained within trunking or conduit.</p> <p>Milled edge lock-rings or hexagonal locknuts shall be fitted to all threaded conduits. Serrated washers shall be used at all bushed conduit connections to steel accessory and junction boxes. XLPE/SWA/LSF cables to be on steel basket or tray. FP 200 type cables are an acceptable alternative.</p> <p>All FP 200 type cables used for main voltage circuits shall be white sheathed. (FP 200 type cable used for low voltage fire alarm circuits shall be red sheathed).</p> <p>Where cables are installed in trunking there must be a minimum 20% free capacity within trunking, Band 1 and Band 2 MUST be separated as per current regulations.</p> <p>All wiring shall be supported so that it will not be liable to collapse in the event of fire.</p> <p>Non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.</p> <p>Subject to approval by WLC M&E Services Team Principal, plastic conduit can be used for limited extensions to existing installations.</p>

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		<p>Subject to the same approval plastic conduit may also be used in 'leasable' Units and the like.</p> <p>Protective covers to low level external cabling/lightning conductors.</p> <p>Avoid:</p> <p>Plastic 'mini-trunking' is not acceptable, except, and subject to prior approval, where space restrictions etc., preclude the installation of steel conduit or for limited extensions to existing systems</p> <p>Prohibited:</p> <p>Twin and earth installations are not acceptable.</p> <p>The use of BS951 bonding clamps on SWA cables contravenes the requirements of the IET Regulations and is not acceptable.</p>
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15.07	Accessories	<p>Council Standard:</p> <p>Cable reels for the use of workshop equipment should operate at 110V.</p> <p>Design Considerations Must Include:</p> <p>Light switches shall be rated at 20A;</p> <p>13A sockets fed via UPS shall be red.</p> <p>A full range of matching accessories is required from selected manufacturer to include but not necessarily be restricted to:- fused connection units, data/voice outlets, fan isolators & 50A DP switches.</p> <p>BS EN 60309 ('Commando') sockets - 110V (yellow), 240V (blue) and 415V (red) - shall be used in all industrial workshop areas for electrical supplies. 13A BS1363 outlets and plugs are not suitable for industrial workshop areas.</p> <p>All accessories shall carry a comprehensive 20-year guarantee.</p> <p>Local surge protection is required for all life-critical and building protection supplies (e.g. Fire/Intruder Alarm equipment), it shall also be provided for other systems such as BMS, Door Access, Lighting Control, etc.</p> <p>White plastic accessories shall comply with BS EN 60669; switch contacts shall be silver; mouldings shall be non-tracking to BS1322; 13A socket outlets and spur outlets to BS1363, double-pole switching, 3mm minimum contact gap and with terminals capable of taking 3 x 4mm² conductors. Terminals shall have captive screws - push-fit terminals are not acceptable. A 'clean earth' option is required.</p>
15.08	Suspended Ceilings	<p>Design Considerations Must Include:</p> <p>For security of mounting, when electrical items, for example light fittings, fire alarm equipment, connection boxes and the like are fixed to ceiling tiles (above or below) a suitable plywood back-board shall be used.</p> <p>In new builds design the main services in corridors to reduce access requirements if a solid ceiling is installed.</p> <p>Where services are in the toilet area ceiling space a solid ceiling may still be acceptable providing the boards are screwed in place and therefore demountable if required.</p> <p>Suspended grid-type ceilings to be suitably erected to suit the weight of light fittings.</p>

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15.09	Lighting	<p>Council Standard:</p> <p>If dimming is required: DALI ‘Switch Dim’ gear.</p> <p>Design Considerations Must Include:</p> <p>LED light fittings must be used for all new installations.</p> <p>The weight of the fitting (from manufacturer’s data) must be used in the design and installation of the fitting supports.</p> <p>All linear LED fittings shall have integral non-detachable diffusers. Where linear LED fittings are surface fixed to plasterboard (or the like) a plywood backplate must be installed to support the entire weight of the fitting.</p> <p>All recessed modular light fittings are to be firmly supported from above(e.g. screwed rod suspensions) and electrically connected via flex and plug-in roses</p> <p>All luminaires to have a 5-year parts & labour guarantee. Cable terminals shall be captive screw type (push-fit not acceptable) and to be capable of accepting 3 x 2.5mm² conductors). All linear fittings shall have punchings to suit standard (600mm centres) BESA box mountings.</p> <p>All wiring shall be supported so that it will not be liable to collapse in the event of fire. Non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.</p> <p>All new light fittings shall be installed as per manufactures guidance, along with WLC recommendations on secureness, the use of “example - penny washer)</p> <p>Fittings shall be specified and selected to avoid the risk of the diffuser falling if accidentally dislodged. Strong preference is for one-piece construction, if necessary however, the use of metal end cap retainers or safety lanyards connecting the diffuser to the fitting will be considered.</p> <p>Fittings installed in areas like sports/gym halls correct IK rated to BS EN 62262 for all lighting/diffusers where the ceiling is high and high impact resistance is required.</p> <p>If dimming is required WLC preference is for the use of DALI ‘Switch Dim’ gear.</p> <p>Prohibited:</p> <p>If Click/Gregg/Marshalling box (multi-gang lighting sockets) are used then the length of the flex from the marshalling box to the light fitting should be no greater than 1.5m</p>
15.10	External Lighting	<p>Council Standard:</p> <p>External lighting to be controlled by Solar Time Switch: Sangamo model Q553 Zone 4 (56`N) and 2 On 2 Off operation.</p> <p>Design Considerations Must Include:</p>

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		Lighting levels to be in accordance with recommendations in current CIBSE Guides.
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15.11	Emergency Lighting	<p>Design Considerations Must Include:</p> <p>Emergency lighting must be self-contained, non-maintained LED fittings - located as necessary.</p> <p>In areas like sports/gym halls where the ceiling is high and high impact resistance is required suitable integral luminaires shall be permitted. Further, all low-level overdoor emergency light fittings in these areas shall be suitably impact rated.</p> <p>Key test switches are required for all emergency fittings. They must be located within or immediately adjacent to the area served by the relevant lights to permit direct observation and will ideally be incorporated in the local lighting switch grid.</p> <p>All wiring shall be supported so that it will not be liable to collapse in the event of fire.</p> <p>Non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.</p> <p>Prohibited:</p> <p>Light fittings with integral emergency gear must not be used.</p>
15.12	Switchboards, Distribution Boards & Consumer Units	<p>Design Considerations Must Include:</p> <p>Consideration of installation location to take into account future expansion.</p> <p>Requirement is for equipment which can have additional devices and circuits fitted safely without the need to isolate the distribution board.</p> <p>Access to all electrical equipment must be adequate to allow for maintenance and repair.</p> <p>A complete distribution chart shall be provided in each Distribution Board & Consumer Unit.</p> <p>'Dual Screw' terminals are preferred for incoming stranded cable connections (meter tails and the like).</p> <p>All distribution equipment shall have no less than 20% spare ways.</p> <p>Surge protection is required at Main Switchboard(s).</p> <p>Switchboards shall be of steel construction and to BEAMA Form 4 Type 6 as minimum.</p> <p>Distribution Boards & Consumer Units shall be of steel construction, with integral switch-disconnector, MCBs and RCBOs as required. Type AC RCDs shall not be used, Type A RCDs are preferred instead. Appropriate type of RCD shall be selected according to the connected equipment in compliance to Current IET Wiring Regulation.</p>

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		Arc Fault Detection Devices (AFDD) are generally not required unless they are sleeping accommodations, locations with high risk of fire, chimneys & lift shafts, timber structures or places with irreplaceable goods.
15.13	Electric Radiant heaters	<p>Design Considerations Must Include:</p> <p>Electric heaters to be ceramic radiant type, complete with control thermostats and time clocks on the circuits feeding heaters.</p> <p>Heaters to have a 2-year warranty on the electronic controls and a 10-year warranty on the heater itself.</p> <p>Frost protection shall be provided by means of thermostatic over-ride of the timed controls.</p> <p>LST (guarded with mesh cage) types required for Early Years, Nurseries and (in certain circumstances) residential homes for the elderly.</p> <p>Avoid:</p> <p>Storage heaters must not be used.</p>
15.14	Lightning Protection and surge protection	<p>Design Considerations Must Include:</p> <p>As per current BS 62305 part 1 to 4</p> <p>Protective covers to low level external cabling/lightning conductors.</p>
15.15	Earthing	All external electric enclosures, housings, kiosks, cabinets or meter boxes must be heavy duty GRP construction.
15.16	Photo Voltaic Systems	Refer Grid-connected Photovoltaic system Design Guide in appendix 3
15.17	UPS (Un-Interruptible Power Supply) Systems	
15.18	Non-Permanent Buildings	<p>Design Considerations Must Include:</p> <p>In the case of non-permanent buildings (e.g. 'Portacabins' and the like) the standard installations, finishes etc. provided by the Supplier will be accepted; however, compliance with the Requirements of BS7671 is of course mandatory.</p>
15.19	O&M manuals	<p>Design Considerations Must Include:</p> <p>To be in accordance with the latest version of BSRIA Building Manuals & Building User Guides" and in an electronic format.</p> <p>All drawings shall be supplied in AutoCAD/Revit and pdf formats.</p>
15.20	Data Cabling	<p>Design Considerations Must Include:</p> <p>All data cabling must be in accordance with the council's latest version of the IT Infrastructure Requirements</p>

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		All wiring shall be supported so that it will not be liable to premature collapse in the event of fire. Non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.
15.21	Portable Appliance Testing	<p>Design Considerations Must Include:</p> <p>To be in accordance with the latest version of the IET Code of Practice for In-Service Inspection and Testing of Electrical Equipment, Electricity at Work Act 1989 and The Management of Health and Safety at Work Regulations 1999</p> <p>Consideration are placed on Manufacturers Guidance/Recommendations</p> <p>The scope of this guidance is limited to Class I and Class II equipment</p> <p>Where properties have a requirement for the Public to use electrical equipment (libraries etc.) additional requirements (dedicated Circuits with addition Protection) as it would be unworkable to ensure that each item is inspected, tested and labelled for electrical safety</p> <ul style="list-style-type: none"> • A Register of all Electrical Equipment • Suitability of environment and the type of Electrical Equipment installed/used • Installation of Fixed Electrical Equipment for accessibility and Maintainability • Cables to be place in such a way that does not give rise to danger, (slip, Trip and Falls)
16.00	Communication/ Security/ Control systems	
16.01	General	<p>Design Considerations Must Include:</p> <p>Systems should be designed in accordance with the following principals:</p> <ul style="list-style-type: none"> • Minimize the requirement regular for maintenance or inspection. • High tech solutions that require specialist contactors to carry out maintenance should be avoided. • Availability of spares and replacement equipment should be taken into account. • Maximize potential economies of scale with other plant and equipment elsewhere in the building's portfolio. <p>Where regular maintenance or inspection tasks are required to be carried out, sufficient space and safe access must be provided.</p> <p>Avoid:</p> <p>Avoid electrical equipment being located at high level that is subject to regular maintenance or inspection. The need to use access equipment such as ladders, tower scaffolds or cherry pickers for regular maintenance inspection or isolation must be avoided.</p>
16.02	Door Access systems	<p>Council Standard:</p> <p>Council Standard for Door Access Control Systems: Paxton door entry/door access, high security Paxton MIFARE cards.</p>

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	<p>As part of the design process, liaison must take place with the councils Term Maintenance Contractor to ensure the final design is consistent with other council systems.</p> <p>Any new Door Access Systems <i>MUST</i> be Paxton 10</p> <p>Design Considerations Must Include:</p> <p>Door entry stations must be at a height of between 900mm (minimum) and 1200mm (maximum).</p> <p>All wiring shall be supported so that it will not be liable to premature collapse in the event of fire – non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.</p> <p>All cabling (for whatever purpose) shall be supported on tray or basket or contained within trunking or conduit.</p> <p>Automatic doors must be open protocol.</p> <p>Prohibited:</p> <p>GEZE manufactured auto doors.</p>
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16.03	Fire Alarm Systems	<p>Council Standard:</p> <p>Council Standard for Fire Alarm Systems: Open protocol panel manufacturers, Discovery, Kentec, Advanced & Morley in that order. Equipment to be by or Apollo and/or Hochiki. Loop powered sounders as standard</p> <p>As part of the design process, liaison must take place with the councils Term Maintenance Contractor.</p> <p>Design Considerations Must Include:</p> <p>All fire alarms systems require to be minimum type L1.</p> <p>The entire fire alarm system (including all cabling) shall be designed, installed, tested and commissioned by a BAFE approved installer/contractor.</p> <p>Minimum of 20% spare capacity required per loop and the panel shall be capable of connection to a remote system manned station.</p> <p>All ancillary parts (detectors, sounders and the like) shall have a 10-year minimum guarantee.</p> <p>Note that Fire Alarm sounders shall have a tone distinctly different from the Period Bells.</p> <p>New systems with stand-alone panels shall be capable of networking to existing fire alarm systems.</p> <p>Fully Open protocol systems are mandatory, closed or managed protocol are not permitted.</p> <p>Local surge protection is required for all life-critical and building protection supplies (e.g. Fire/Intruder Alarm equipment), it shall also be provided for other systems such as BMS, Door Access, Lighting Control, etc.</p> <p>FP 200 cable used for low voltage fire alarm circuits shall be red sheathed. (All FP 200 cables used for main voltage circuits shall be white sheathed.)</p> <p>All wiring shall be supported so that it will not be liable to premature collapse in the event of fire. Non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.</p> <p>All cabling (for whatever purpose) shall be supported on tray or basket or contained within trunking or conduit.</p> <p>A data point should be provided adjacent to the fire alarm panel to allow for potential future networking.</p>
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Section	WLC Employer's Design Requirements	
16.04	Alarm Receiving Centre	<p>Design Considerations Must Include:</p> <p>Communication required for Fire and Intruder Alarm monitoring via 'GSM DualCom' integrated dual signaling radio/radio path device</p> <p>Dedicated Comms path required for Fire and Intruder Alarm monitoring as above.</p> <p>As part of the design process, liaison must take place with the councils Term Maintenance Contractor.</p>
16.05	CCTV	<p>Council Standard:</p> <p>Council Standard for CCTV Systems: Open protocol NVR 8 to16 channel recorders multiples, 2-8 terabyte storage capacity, over IP, min 5 MEGAPIXEL cameras. No HIK VISION, PELCO or BBV.</p> <p>As part of the design process, liaison must take place with the councils Term Maintenance Contractor.</p> <p>Design Considerations Must Include:</p> <p>CCTV is not required as a standard but must be justified by a supporting business case in line with the Council Policy on Installation and use of CCTV.</p> <p>All wiring in escape routes shall be supported so that it will not be liable to collapse in the event of fire.</p> <p>Non-metallic clips, cable ties, mini-trunking and the like are precluded as the sole means of support.</p> <p>Cameras and recording equipment to be of a standard capable of producing and recording images of the evidential quality required for prosecution.</p> <p>All cabling (for whatever purpose) shall be supported on tray or basket or contained within trunking or conduit.</p> <p>Prohibited:</p> <p>PTZ cameras must not be used unless specifically requested and approved by WLC</p>

Section	WLC Employer's Design Requirements
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16.06	Intruder Alarms	<p>Council Standard:</p> <p>Council Standard for Intruder Alarm Systems: Galaxy panels, dual tech grade 3 devices and dual comm connection signalling.</p> <p>Design Considerations Must Include:</p> <p>Minimum of 20% spare capacity required in the panel, to be capable of connection to a remote manned station. Open protocol systems are mandatory, closed or 'managed' protocol systems are not permitted.</p> <p>Local surge protection is required for all life-critical and building protection supplies (e.g. Fire/Intruder Alarm equipment), it shall also be provided for other similar systems such as BMS, Door Access, Lighting Control, et c.</p> <p>All wiring shall be supported so that it will not be liable to detachment or collapse in the event of fire. Non-metallic clips, cable ties, PVC mini-trunking and the like are precluded as the sole means of support. Dual comm signaling/monitoring device to be provided and linked to fire system and a dedicated phone line provided for signaling</p> <p>All cabling (for whatever purpose) shall be supported on tray or basket or contained within trunking or conduit.</p> <p>Prohibited:</p> <p>Redcare lines must not be used.</p>
16.07	Induction Loops	<p>Design Considerations Must Include:</p> <p>To be in accordance with Building Standards Technical Handbook 2020: Non-domestic. Comply with 4.7.1 Hearing Enhancement Systems points a, b, c & d and to be incorporated into TV/cinema rooms within care homes.</p> <p>This standard would be required to be met in all new build and substantially refurbished properties. However, it does not apply retrospectively to existing buildings.</p> <p>As a result, it is proposed that the above be adopted as the standard required for existing council buildings used by the public. It is also proposed that the following be added to the above list:</p> <p>Where there are rooms with a floor area of more than 60m² and is intended for meetings then the largest room should have a hearing enhancement system. (This specifically excludes classrooms in schools where hearing enhancement systems will be provided to meet specific pupil requirements.)</p>

Section		WLC Employer's Design Requirements
17.00	Transport systems	
17.01	General	<p>Design Considerations Must Include:</p> <p>Systems should be designed to minimize requirements for maintenance.</p> <p>Where maintenance tasks are required to be carried out, then sufficient space and access must be provided. Avoid high level access to plant or equipment that requires regular maintenance.</p> <p>Avoid:</p> <p>No plant should be place on the roof. Where this is unavoidable, careful consideration is required of how the area could be re-roofed in the future without service disruption or costly access equipment.</p>
17.02	Vertical platform lift systems	<p>Design Considerations Must Include:</p> <p>Consideration to be given for a secondary lift where a lift is critical for users, example in Sheltered Housing or Care Homes. This allows the service to continue to function even if one lift is out of service.</p> <p>All components should be open protocol</p> <p>Intercom GSM unit to include SIM card</p>
17.03	Inclined stair-lift systems	
18.00	Building Fabric Reference Specification	
18.01	General	<p>Council Standard:</p> <p>10% betterment on fabric U-values</p>
19.00	Management of Asbestos in Construction	
19.01	General	<p>Any design and construction work involving management of asbestos by a third party shall follow the councils Management of Asbestos in Construction Work –Employer Requirements.</p>

Appendix 1

West Lothian Council

Property Services Employers Design Requirements (EDR)

Signage Protocol For New Buildings

Fire Signage 9.06

Escape Routes

In a building where the accommodation incorporates open spatial planning escape should be away from the **opening and** the subsequent escape route should not pass within 4.5 m of the opening.

BS 9999: 2017. Fire safety in the design, management and use of building

Buildings should be designed and equipped such that in an emergency the occupants of the building can make their way easily to a place of relative or ultimate safety. Designers should take account of human behaviour, in particular in emergency situations, and seek to use this behaviour to lead people to safety, rather than design a complex system that requires a rapid learning process by the occupants at a time of stress.

BS 9999: 2017. Fire safety in the design, management and use of building

It is recommended that the following points are observed in the provision of escape routes necessary in case of fire:

- The provision of compartment walls intended to assist escape should be simple in geometry and layout; where possible they should form a lateral division perpendicular to the building long axis and reach both sides of the building width.
- The provision of Compartment Walls should not accommodate extended travel distances of escape routes unless the compartment of alarm origin and the destination compartment can be individually identified by the evacuee eg in premises with a fire strategy including phased evacuation, staged evacuation, zoned evacuation, or progressive evacuation, so that the compartment of hazard can be clearly identified and escape made towards the compartment of relative safety.


All routes and doors affording means of escape must be conspicuously signed in accordance with the standards set out in the guidance contained within BS 5499-4; 2013, BS EN 7010:2012, 92/58/EEC and the relevant WLC Fire Strategy document to ensure that persons are not at risk of delay in making their escape in the event of fire.


The provision of signage in new buildings should be consistent with the examples below; variations are acceptable only where the intent of the sign is achieved clearly, simply, and without ambiguity.


Index


sect	detail	function	section	detail	function
1a	main entrance, only exit	final exit	4g	sliding door	final exit, escape route
1b	main entrance, other exits	final exit	5a	assembly point	ultimate safety
1c	routine access	final exit	5b	assembly point, directional	ultimate safety
1d	fire exit	final exit	5c	refuge	escape route
1e	intermediate doorway	escape route	5d	refuge comms	escape route
1f	directional sign	escape route	6	fire extinguishers	firefighting
1g	alternate route, unorthodox	escape route	7a	foam inlet	SFRS systems
1h	compartment wall	escape route	7b	risers, dry, wet	SFRS systems
1i	illuminated signage	emergency lights	7c	sprinkler	fixed systems
2	fire action notice	instruction	7d	suppression, local	fixed systems
3a	fire door keep shut	fire resistance	7e	suppression, flooding	fixed systems
3b	fire door keep locked	fire resistance	7f	utilities	SFRS systems
3c	fire door, hold open	fire resistance	7g	fire fighter's switch	SFRS systems
3d	fire exit keep clear	final exit	7h	Automatic Opening Vents	ventilation
3e	secured doors	final exit	7i	Manually Operated Vents	ventilation
3f	restricted access doors	escape route	8a	hydrant plate	SFRS systems
3g	fire shutter, manual	fire resistance	8b	hydrant lids	SFRS systems
3h	fire shutter, automatic	fire resistance	9a	hazard, small buildings	hazard
3i	fire walls	fire resistance	9b	hazard, medium or larger buildings	hazard
4a	push bar	final exit	9c	hazard, yard	hazard
4b	push pad	final exit			
4c	push pull	escape route	10	fire path	SFRS systems
4d	push pull	escape route			
4e	turnbuckle	final exit, escape route	11	floor levels, stairs	SFRS systems
4f	turnbuckle, lever handle	final exit, escape route			


1	sign	door type		context
1a	<ul style="list-style-type: none"> no sign 	Main Door, or Main Entrance		No exit sign is necessary where the main door or entrance is the only means of access or egress for a premises.


1	sign	door type	location	context
1b		Main Door, or Main Entrance	Positioned above door.	<p>A pictogram with the running man symbol and the supplementary text 'exit' should be used to indicate the exit if:</p> <ul style="list-style-type: none"> the door is the main entrance or doorway, and it is a final escape for a designated escape route from that area or the building (ie it is required for escape), and other fire exits are available from that corridor, space or area. <p>A pictogram with the running man symbol and the supplementary text 'exit' should not be used if it is not part of a designated (ie required) escape route.</p>


1	sign	door type	location	context
1c		Routine Access Final Exit	Positioned above door.	<p>A pictogram with the running man symbol and the supplementary text 'exit' should be used to indicate the exit if:</p> <ul style="list-style-type: none"> the door is a final fire exit, and is routinely used for access and egress eg <ul style="list-style-type: none"> staff entrance 2nd occupier entrance yard entrance secondary entrance common use transit route <p>A pictogram with the running man symbol and the supplementary text 'exit' should not be used if it is not part of a designated (ie required) escape route or is not a final exit door.</p>


1	sign	door type	location	context
1d		final exit door	Positioned above door.	A pictogram with the running man symbol and the supplementary text 'fire exit' should be used if the door indicated is a final exit provided as part of a designated escape route available as an alternate or additional route to support emergency evacuation of the premises.

1	sign	door type	location	function	context
1e		doorway on escape route, -not final exit corridor or open space on escape route	1. Suspended in corridor leading to door. 2. Suspended in open areas. 3. Suspended in front of door. 4. Positioned above door.	meaning 1. Progress forward from here (indicating direction of travel). 2. Progress forward and through from here, when sign is sited above a door (indicating direction of travel),	FIRE EXIT notices should indicate the final exit from a designated escape route or any doors or passageways which act as any emergency egress. At least one escape route or doorway leading to an escape route should be visible from any open place or transit route. Where the direction of travel for escape is not conspicuous or confusion could occur, the route should be indicated by a sign. A pictogram with the running man symbol and a directional arrow should be used to support escape where necessary. In addition signs should be evenly spaced and consistently located so that the evacuee can effectively and quickly predict the location of the next sign within the escape route. Signs should not be fixed to doors or sited where they could be obscured by opening doors. Signs above doors or open spaces should be mounted between 2 m and 2.5 m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practicable. All rooms or areas with more than one fire exit or escape route should have each designated escape route supported by appropriate signage. See also 'final exit signage'. Additional guidance on the location and use of escape route signage may be found in BS 5499-4.




	sign	door type	location	context
1f		directional	<ol style="list-style-type: none"> 1. On corridor walls. 2. Suspended adjacent and left of the exit. 3. Suspended at change of direction. 	<p>All routes and doors affording means of escape must be conspicuously signed in accordance with the standards set out in the guidance contained within BS 5499-4; 2013, BS EN 7010:2012, 92/58/EEC and the relevant WLC Fire Strategy document to ensure that persons are not at risk of delay in making their escape in the event of fire.</p> <p>FIRE EXIT notices should indicate the final exit from a designated escape route or any doors or passageways which act as any emergency egress.</p> <p>At least one escape route or doorway leading to an escape route should be visible from any open place or transit route. Where the direction of travel for escape is not conspicuous or confusion could occur, the route should be indicated by a sign. A pictogram with the running man symbol and a directional arrow should be used to support escape where necessary.</p> <p>In addition signs should be evenly spaced and consistently located so that the evacuee can effectively and quickly predict the location of the next sign within the escape route. Signs should not be fixed to doors or sited where they could be obscured by opening doors. Signs above doors or open spaces should be mounted between 2 m and 2.5 m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practicable. Signs sited on walls should be mounted between 1.7 m and 2 m, from floor level measured to the base of the sign; signs should be sited at the same height throughout the escape route, so far as is reasonably practicable.</p> <p>Additional guidance on the location and use of escape route signage may be found in BS 5499-4.</p>


1	sign	door type	function	context
1g		<p>a) room escape via second room</p> <p>b) enter into room, from a corridor, as part of an alternate escape route</p> <p>c) doorway into secondary compartment, as part of an alternate escape route</p> <p>*don't conflict with 'C' exit sign</p>	<p>a) escape from room through a second room as part of an alternate escape route (- not to be used for inner room / access room)</p> <p>b) escape as part of an unorthodox alternate escape route eg which requires entry into a room from a corridor (sequence of escape = initial room, corridor, second room (B), final exit)</p> <p>c) escape as part of an alternate escape route which requires entry into another compartment to escape, particularly where conflicting with other escape signage eg reciprocal compartment travel flow.</p> <p>*NB Don't conflict with 'C' exit sign</p> <p>d) NB *use only where alternate escape route is unorthodox ie doesn't follow standard sequence of escape, or may conflict with escape routes from other areas.</p>	<p>a) escape from room where:</p> <ul style="list-style-type: none"> • more than 1 exit is available • alternate route is necessary for compliance eg because of excessive travel distance via primary route • alternate route is unorthodox eg exits via a second room, or other lesser quality escape route • sequence of escape <ul style="list-style-type: none"> ○ primary route: initial room, corridor, final exit ○ alternate route: initial room, second room, final exit <p>b). escape from room or area where:</p> <ul style="list-style-type: none"> • more than 1 exit is available • alternate or secondary route is necessary for compliance eg because of excessive travel distance via primary route • alternate route is unorthodox eg <ul style="list-style-type: none"> ○ not conventionally recognizable as an escape route, or ○ exits via a corridor then into another room to reach a final exit ○ conflicting signage direction occurs eg sign (B) indicates that the room should be entered for escape but the original occupants of the room desire to exit through the same doorway into the corridor • sequence of escape <ul style="list-style-type: none"> ○ primary route: initial room, corridor, final exit ○ alternate route: initial room, corridor, second room, final exit <p>c) escape as part of an alternate escape route which requires entry into another compartment to escape, particularly where conflicting with other escape signage eg reciprocal compartment travel flow</p> <p>Conflicting exit signage ie where exit signs are positioned on both sides of the same doorway, should be explained within the fire strategy document, included in staff training, and supported by a clear and obvious decision making process for the evacuees.</p> <p>A primary route would generally be the first choice for evacuation of a room, area, or compartment; however, where hazard obstructs the primary escape route ie fire is found, then use of the alternate or secondary route may be necessary. All occupants should be aware of, or be supported in, evacuation flexibility that may be necessary to achieve safety.</p> <p>The use of 'secondary route' signage should warn users of possible opposing traffic flows. The provision of conflicting signage should:</p> <ul style="list-style-type: none"> • not be used where confusion is likely to result in significant delays or impediment to attainment of safety; • include an impact assessment on building users ie would: <ul style="list-style-type: none"> ○ anxieties of user groups be increased during a fire, or alarm, incident ○ user groups properly recognize the availability of safety ○ individuals within user groups be subject to unnecessary anxiety or exposed to possibility of harm ○ vulnerable individuals be properly supported and protected in all circumstances <p>The provision of exit signage with potential for confusion or ambiguous interpretation should be clearly explained within the architect's fire strategy document and the management Emergency Action Plan.</p>



1	sign	door type	function	context
1h		<p>a) doorway into second compartment</p>	<p>a) escape as part of a primary escape route which requires entry into another compartment to escape</p> <p>b) to highlight availability of relative safety in buildings using progressive evacuation</p>	<p>a) escape as part of a primary escape route which requires transit through another compartment to escape</p> <p>b) escape as part of an escape route where the fire strategy dictates evacuation into an adjacent compartment as sanctuary [ie where progressive evacuation is a basic feature of the fire strategy]</p> <p>.....</p> <p>Conflicting exit signage ie where exit signs are positioned on both sides of the same doorway, should be explained within the fire strategy document, included in staff training, and supported by a clear and obvious decision making process for the evacuees.</p> <p>A primary route would generally be the first choice for evacuation of a room, area, or compartment; however, where hazard obstructs the primary escape route ie fire is found, then use of the alternate or secondary route may be necessary. All occupants should be aware of, or be supported in, evacuation flexibility that may be necessary to achieve safety.</p> <p>The use of 'secondary route' signage should warn users of possible opposing traffic flows.</p> <p>The provision of conflicting signage should:</p> <ul style="list-style-type: none"> not be used where confusion is likely to result in significant delays or impediment to attainment of safety;







1	illuminated signage	function	context
1i		<p>The green figure is preferred for face and externally illuminated signs.</p> <p>The white figure is preferred for self-luminous and internally illuminated signs.</p>	<p>All fire safety signs should be illuminated under normal conditions (signs that are not internally lit or back-lit should be lit by primary or secondary lighting).</p> <p>Internally lit or back-lit signs should remain illuminated in the event of power failure.</p>


	sign	context
2	fire action notice	<p>Printed FIRE ACTION notices should be displayed at conspicuous positions in the premises. They should state in concise terms the essentials of the action to be taken upon discovering a fire and on hearing the fire alarm. The notices should be permanently fixed in position and located in prominent positions, such as where staff routinely assemble, and by each fire alarm call point.</p>



3	sign	door type	dimensions	context
3a		fire door	lower case height 5mm notice diameter 60mm	<p>All fire resisting self-closing doors are to be permanently marked on each side at eye level with a blue circular notice bearing the words 'Fire Door Keep Shut' in white letters not less than 5 mm in height.</p> <p>Fire doors to cupboards and to service ducts should be marked on the outside.</p> <p>All other fire doors should be marked on both sides.</p> <p>Fire Doors are designated according to their role and function within the building in accordance with the architect's intent and fire strategy; doors meeting a particular standard of fire resistant construction but without forming part of a comprehensive fire strategy are not to be signed as 'fire doors'.</p> <p>Fire Doors and Final Exit Doors should be identified within a consistent numbering system, labelled, and recorded on a suitable drawing and accompanying list.</p>
3b		restricted access fire door	lower case height 5mm notice diameter 60mm	<p>Cupboard doors and service room doors required to be of fire resisting construction should be permanently marked on the outside, with a blue circular notice bearing the words 'Fire Door Keep Locked Shut' in white letters not less than 5 mm in height on the outer face of such doors.</p> <p>Fire doors to cupboards and to service ducts should be marked on the outside.</p> <p>All other fire doors should be marked on both sides.</p> <p>Fire Doors are designated according to their role and function within the building in accordance with the architect's intent and fire strategy; doors meeting a particular standard of fire resistant construction but without forming part of a comprehensive fire strategy are not to be signed as 'fire doors'.</p> <p>Fire Doors should be identified within a consistent numbering system, labelled, and recorded on a suitable drawing and accompanying list.</p>
3c		held open fire door	lower case height 5mm notice diameter 60mm	<p>All automatic fire resisting self-closing doors should be permanently marked on the exposed side at eye level with a blue circular notice bearing the words 'Automatic Fire Door Keep Clear' in white letters not less than 5 mm in height.</p>

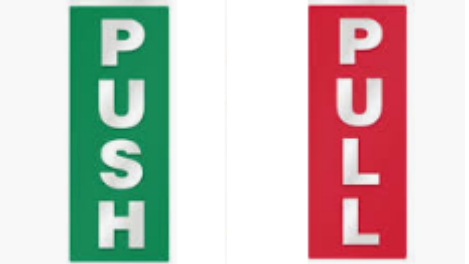
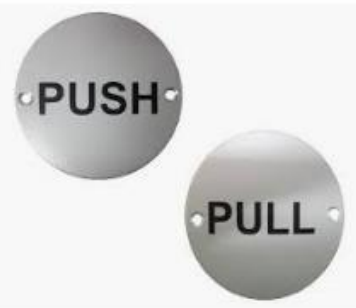
3d		final exit door	<p>lower case height 15mm</p> <p>notice diameter 180mm</p>	<p>All final exit doors required to be secured locked shut ie those doors fitted with pressure type fastenings, should be provided with a notice stating 'fire Door Keep Clear' on the external face of the said door. The notice should consist of white block capital letters not less than 15mm in height on a blue circular background and be positioned approximately 1.4m on the door in a central position.</p> <p>Fire Doors are designated according to their role and function within the building in accordance with the architect's intent and fire strategy; doors meeting a particular standard of fire resistant construction but without forming part of a comprehensive fire strategy are not to be signed as 'fire doors'.</p> <p>Final Exit Doors should be identified within a consistent numbering system, labelled, and recorded on a suitable drawing and accompanying list.</p>
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3	sign	door type	dimensions	context
3e		secured doors	lower case height 5mm notice diameter 60mm	<p>Where additional security fastenings such as chains, padlocks, locking bars, drop bolts, slip bolts or other substantial security apparatus are used on fire exit doors when the premises are unoccupied, signs should be fixed on the inside face of the doors worded 'Remove Security Fastening when Premises are Occupied' in 5mm letters [circular sign, colour blue with white text].</p>
3f		restricted access emergency doors	lower case height 5mm notice diameter 60mm	<p>Some doors on escape routes necessary for escape, ie signed as a fire exit, may have impediments to instant access eg: electrical locks without public access button; or plastic 'break free' tabs. These features are intended to restrict uninhibited travel throughout a public building while still providing emergency escape facilities. Such doors should be fitted with a suitable sign, located on the door, on the face approached by persons intending to escape. The use of such features should not be arbitrarily applied but should be identified within the architect's fire strategy document and the management Emergency Action Plan.</p> <p>It should be noted that electrically powered locks should not be installed on a door which provides the only route of escape for persons, or which serves a room or storey with more than 60 persons, or a door on a fire-fighting shaft.</p>


3	sign	dimensions	context
3g	<p>fire shutter, manual operation</p>   	<p>'Fire Shutter' in 10mm letters [rectangular sign, colour red with white symbol and white lettering]</p> <p>together with a sign worded 'Fire Shutter Close when Not In Use' in 5mm letters [circular sign, colour blue with white text].</p>	<p>Any hatchway provided with a Manually Operated Shutter should have a composite sign fixed adjacent to the shutter or hatch so that it can be seen when the door or hatch is open worded 'Fire Shutter' in 10mm letters [rectangular sign, colour red with white symbol and white lettering]</p> <p>together with a sign worded 'Fire Shutter Close when Not In Use' in 5mm letters [circular sign, colour blue with white text].</p> <p>The area below any fire shutter that operates automatically should be conspicuously indicated, for example by a red and white line, on the floor or counter. The striped line should indicate the lowest contact area when closed so that any obstructions to proper operation may be readily identified.</p>
3h	<p>fire shutter, automatic</p>   	<p>'Fire Shutter' in 10mm letters [rectangular sign, colour red with white symbol and white lettering]</p> <p>together with a sign worded 'Automatic Fire Shutter Keep Clear' in 5mm letters [circular sign, colour blue with white text].</p>	<p>Any hatchway provided with an Automatic Fire Shutter should have a composite sign fixed on each side of the shutter opening, worded 'Fire Shutter' in 10mm letters [rectangular sign, colour red with white symbol and white lettering]</p> <p>together with a sign worded 'Automatic Fire Shutter Keep Clear' in 5mm letters [circular sign, colour blue with white text].</p> <p>The area below any fire shutter should be conspicuously indicated, for example by a red and white line, on the floor or counter. The striped line should indicate the lowest contact area when closed so that any obstructions to proper operation may be readily identified.</p>


3	sign	dimensions	context
3i		<p>equilateral triangle sides of 60mm</p> <p>red borders</p> <p>white background</p> <p>black text</p> <p>text 'FR' = full size</p> <p>text '30' = 0.65 size of 'FR'</p> <p>legend 'FR' + number reflecting fire resistance in minutes eg</p> <p>short duration = 30mins, = FR30</p>	<p>In some circumstances designed fire walls are later penetrated during refurbishment, remedial works, or other service adjustments by cables, pipework, or accidental impact. Such damage may be unnoticed where sight of upper levels is obscured by suspended ceilings or within ceiling 'blackspace' service areas.</p> <p>It is intended that walls and partitions designed and provided with the intention of resisting the passage of fire, heat and smoke, should be marked with suitable signage in obscured or hidden voids to remind contractors and others of the need to maintain designed fire resistance. This is particularly important in close proximity to protected zone stairwells (and where appropriate – protected corridors).</p> <p>It is intended that protected zones, (and where appropriate – protected corridors), compartment walls, sub compartment walls, and roofspace cavity barriers, should have suitable signage provided in remote, hidden or obscured areas as indicated:</p> <p>every 4m along a single lateral line</p> <ul style="list-style-type: none"> • above suspended ceiling • in services voids • in ceiling 'blackspace' service features • 150mm above <ul style="list-style-type: none"> ○ suspended ceiling, or ○ ceiling datum line in blackspace services area, or ○ similar <p>and (in remote, hidden or obscured areas):</p> <ul style="list-style-type: none"> • above doorways • on wall at intersecting partitions- 150mm from adjacent wall (each FR wall at intersection to be fitted with it's own identifying label) • 150mm above <ul style="list-style-type: none"> ○ suspended ceiling, or ○ ceiling datum line in blackspace services area, or ○ similar <p>and</p> <ul style="list-style-type: none"> • below existing service cable or pipe penetrations (only 1x sign would be required for any particular group or 'clump' of cable or pipe penetrations)


4	sign	door type	dimensions	context
4a	Push Bar 	final exit door	The notice should consist of white text, not less than 50mm in height, on a green background	Notices should be provided at all doors provided with pressure type opening devices detailing the method of operation of the said device ie 'Push Bar To Open' . The notice should consist of white text, not less than 50mm in height, on a green background and sited immediately above the door opening device.
4b	Push Pad 	final exit door	'Push' or 'Push to Open' in 15mm letters [rectangular sign, colour green with white text].	Push Pad devices should only be used on final exit doors where: <ul style="list-style-type: none"> • less than 60 people require to make use of the door to escape, and • occupants can be expected to be familiar with the device <p>Wherever an emergency exit device (commonly referred to as a 'push pad') is provided, there should be a sign on the operating pad worded 'Push' or 'Push to Open' in 15mm letters [rectangular sign, colour green with white text].</p>


4	sign	door type	context
4c	Push / Pull 	main entrance, or door across escape route	<p>Wherever a door on a fire escape route is fitted with a fastening the operation of which may not be immediately apparent, a notice should be provided adjacent to the device explaining its operation.</p> <p>A suitable sign should be provided on the side of the door approached by persons making an escape.</p>
4d	Push / Pull 	main entrance, or door across escape route	<p>Wherever a door on a fire escape route is fitted with a fastening the operation of which may not be immediately apparent, a notice should be provided adjacent to the device explaining its operation.</p> <p>A suitable sign should be provided on the side of the door approached by persons making an escape.</p> <p>Where considered necessary suitable signage colours or style may be adopted for consistency with the general aesthetics; one example is shown.</p>


4	sign	door type	context
4e	Turnbuckle 	main entrance, or door across escape route	<p>The time taken to negotiate a closed door can be critical in escaping. Doors on escape routes (both within and from the building) should therefore be easily identified and readily openable by all people.</p>


			<p>In general, doors on escape routes (whether or not the doors are fire doors) should either not be fitted with lock, latch or bolt fastenings, or be fitted only with simple fastenings that can be readily operated from the side approached by people making an escape. The operation of these fastenings should be readily apparent and without the use of a key and without having to manipulate more than one mechanism.</p> <p>Where a door on an escape route has to be secured against entry when the building or part of the building is occupied, it should only be fitted with a lock or fastening which is readily operated, without a key, from the side approached by people making their escape.</p> <p>Wherever a door on a fire escape route is fitted with a fastening the operation of which may not be immediately apparent, a notice should be provided adjacent to the device explaining its operation.</p> <p>A suitable sign should be provided on the side of the door approached by persons making an escape.</p> <p>A turnbuckle should be of sufficient size and shape to allow simple and easy operation for all building users. The turnbuckle should be located a sufficient distance from the door jamb to avoid the door operator's hand conflicting with the intended door operation.</p>
4f	<p>Turnbuckle</p> <p>Lever Handle</p> 	<p>main entrance, or</p> <p>door across escape route</p>	<p>The time taken to negotiate a closed door can be critical in escaping. Doors on escape routes (both within and from the building) should therefore be easily identified and readily openable by all people.</p> <p>Wherever a door on a fire escape route is fitted with a fastening the operation of which may not be immediately apparent, a notice should be provided adjacent to the device explaining its operation.</p> <p>A suitable sign should be provided on the side of the door approached by persons making an escape.</p> <p>Wherever a door fitted with turnbuckle or lever handle opens against the direction of travel for escape, a sign as indicated, should be provided beneath the turnbuckle or lever handle on the side of the door approached by persons making an escape.</p>




4g	Sliding Door 	main entrance, or door across escape route	<p>Wherever a door is fitted with a fastening the operation of which may not be immediately apparent, a notice should be provided adjacent to the device explaining its operation.</p> <p>A suitable sign should be provided on the side of the door approached by persons making an escape.</p>
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5	sign	context
5a	Assembly Point 	<p>Sign provided to indicate the location of a safe assembly point and to enable people to be accounted for following the evacuation of a building or premises.</p> <p>On completion of evacuation, all staff should be instructed to report to a previously determined assembly point or points, which should be located sufficiently far from the premises to minimize interference with the fire and rescue service or danger from falling debris, but should be accessible and not so far away as to discourage people from assembling.</p>
5b	Assembly Point, directional signage	<p>Sign provided to indicate the location of a safe assembly point.</p> <p>Where, when escaping from a final exit, the subsequent direction of travel outside the building towards the assembly point is not necessarily clear or unambiguous then the addition of appropriate directional signage may assist escape, particularly if that part of the external escape route is enclosed or restrictive.</p> <p>It is not necessary to provide additional directional signage outside the building if the position of relative safety outside the building is open, unenclosed, clear of the building and relatively free from risk of harm.</p>
5c	Refuge Point	<p>Refuges are places of relative safety where people whose abilities or impairments might result in delayed evacuation can await assistance from building management with the next part of their movement to a place of ultimate safety. All escape routes, including refuges, should be maintained free from obstruction.</p> <p>Where refuges are provided, each refuge should have:</p> <ul style="list-style-type: none"> • a sign indicating the refuge [rectangular sign, colour green with white symbol and white text]; and,

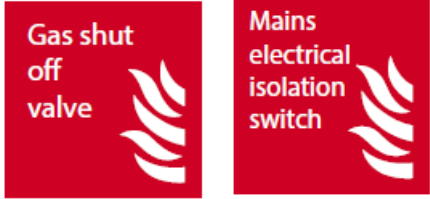

		<ul style="list-style-type: none"> a sign to read 'Keep Clear' [circular sign, colour blue with white symbol and text].
5d	Refuge Communications	<p>Refuges should be provided with a system of two-way communication between those waiting in each refuge and the team who are organizing the evacuation of the building. These two-way communication systems should be such that they are readily operated by, and comprehensible to, all persons likely to need to use them.</p> <p>In addition each refuge should have a clear notice detailing the method of operation of the emergency communication system.</p>

	sign	context
6		<p>Where portable fire-fighting equipment is provided but is not readily visible due to provision within enclosed cupboards, hidden recesses, or similar then the location of the equipment should be highlighted by suitable signage indicating the number and type of equipment provided.</p>

7	sign	function	dimensions	comment
7a		to indicate the location of a foam inlet	<p>red square, white text</p> <p>lower case letter height 15mm</p> <p>height of square 120mm</p>	

7b		to indicate the location of a riser inlet or outlet	<p>red square, white text</p> <p>lower case letter height 15mm</p> <p>height of square 120mm</p>	
7c		to indicate the location of a sprinkler stop or control valve	<p>red square, white text</p> <p>lower case letter height 10mm</p> <p>height of square 120mm</p>	
7d		to indicate the location of a 'local suppression' stop or control valve	<p>red square, white text</p> <p>lower case letter height 10mm</p> <p>height of square 120mm</p>	<p>Any room containing a local suppression system eg kitchen canopy, or server cabinet, should be provided with suitable signage in an appropriate location close or near to the point of operation. Suppression control valves should be appropriately indicated and, where necessary, appropriate operating instructions should be supplied in a suitable notice.</p> <p>The method of use, operating instructions, and actions required by staff, should be included within the architect's fire strategy document and the management Emergency Action Plan.</p>
7e		to indicate the location of a fixed fire extinguishing battery	<p>red square, white symbol</p> <p>height of square 120mm</p>	<p>The room used for the cylinder storage of a 'flooding' suppression system should be indicated by suitable signage at the point of entry.</p> <p>In addition to the sign indicated, any room covered by a gaseous 'flooding' suppression system that could, when discharged, render that room hazardous to life should be provided with suitable warning signage at each point of entry in accordance with HSE guidance.</p> <p>The method of use, operating instructions, and actions required by staff, should be included within the architect's fire</p>

				strategy document and the management Emergency Action Plan.
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7	sign	function	dimensions
7f		to indicate the location of a gas shut off valve or mains electrical isolation switch	<p>red square, white text</p> <p>lower case letter height 8mm</p> <p>height of square 120mm</p>
7g		to indicate the location of a fire-fighters switch	<p>red square, white text</p> <p>lower case letter height 8mm</p> <p>height of square 120mm</p>
7h	AOV	to indicate the location of an ' Operate To Close ' switch for an automatic smoke vent	<p>white rectangle, black text</p> <p>upper case letter height 60mm</p> <p>height of rectangle 120mm</p>
7i	MOV	to indicate the location of an ' Operate To Open ' switch for a manual smoke vent	<p>white rectangle, black text</p> <p>upper case letter height 60mm</p>

			height of rectangle 120mm
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8	sign	context
8a	hydrant plate	Hydrants within the building grounds should be indicated by a suitable indicator plate conforming to BS 3251 to support hydrant identification by the fire service. The sign should be located directly perpendicular to the hydrant to which it relates.
8b	hydrant lid	The hydrant lids within the building grounds are to be painted Canary Yellow [Colour Reference No: 309 - BS 381C] so as to be clearly and easily recognizable by the local authority fire brigade.

9	sign	context
9a	hazard, smaller buildings	The awareness of hazard for firefighters should be supported by the provision of appropriate hazard warning signage; suitable signage should where possible be located at each natural point of entry or access to the building. Where smaller buildings routinely contain substantially hazardous materials eg acetylene, explosives, or substantial LPG storage, then appropriate signage should be provided in accordance with HSE guidance.
9b	hazard, rooms, medium or larger buildings	The awareness of hazard for firefighters should be supported by the provision of appropriate hazard warning signage. Where medium or larger buildings routinely contain substantially hazardous materials eg acetylene, explosives, LPG storage, compressed gas cylinders, toxins, oxidisers, flammable liquids, bio hazards, or radioactive materials, then appropriate signage should be provided at the point of entry of relevant rooms in accordance with HSE guidance.

9c	hazard, yards	<p>The awareness of hazard for firefighters should be supported by the provision of appropriate hazard warning signage; suitable signage should where possible be located at each natural point of entry or access to the building including access via enclosed yards.</p> <p>Where industrial yards contain materials of substantial risk eg LPG or acetylene storage, then suitable signage should be provided, at the point of vehicle access into the yard, in accordance with HSE guidance.</p>
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	sign	dimensions	context
10	fire path	rectangular sign black border white background black text	<p>Vehicle Access paths provided for use of fire appliances should be clearly marked at the points of access or egress including the text 'Fire Path Keep Clear'. The sign should be accompanied by suitable text to indicate the maximum acceptable weight limit.</p> <p>Fire Paths should be clearly outlined within a Fire Strategy drawing and accompanied by a suitable descriptive narrative including acceptable conditions for crossing paved, landscaped, or off-road areas.</p>

	sign	context
11	floor level in stairwells	<p>Signs should be provided in stairways to identify the current floor, and the final exit from the stair.</p> <p>Final exits should be apparent to persons who might need to use them. This is particularly important where the exit opens off a stair that continues down, or up, beyond the level of the final exit.</p>

APPENDIX 2	Toilet Design Guide
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Revision	Date	Notes
E	December 2020	General update and specific updates to 3.02, 3.03 & 3.06. 3.08 Glass mirrors added.
D	3/10/2017	Cubicle materials updated
C	28/1/2016	Updated to reflect comments from Toilet Design Workshop
B	26/11/2015	Conflict in Section 25 regarding sensor taps removed.
A		Amendments to IPS Panel fixings
	4/3/2014	Approved at CS Project Review

1.00	General	
1.01	Project Delivery	<p>Design Consideration Must Include:</p> <p>When planning pupils' toilets, pupils should be involved as much as possible to encourage ownership and pride and improve behavior.</p>
1.02	Location	<p>Design Consideration Must Include:</p> <p>Modern design favours an open plan approach incorporating clear sight lines, eliminating hidden corners and the adoption of hand-washing areas (that may be mixed sex, if appropriate), easily visible outside the washroom area and open to circulation areas – which allows staff to passively supervise the toilets. Toilets should be sited within the heart of a school rather than at its far reaches.</p> <p>Consideration should be given to the following:</p> <ul style="list-style-type: none"> • Currently many pupils have to travel some distance within the school to get to the toilet. This can make teachers reluctant to let pupils out of class to visit the toilet. Toilets located away from classrooms present particular difficulties for pupils with special needs. • Toilets attached to each classroom or cluster of classrooms are a particularly good solution for younger pupils. These allow pupils easier access to toilets during lessons and enable teachers to keep a closer eye on pupils. • Toilets which can be accessed directly from outdoor recreation spaces should be considered. • If practical, toilets for specific year groups should be considered. • Rooms where exams may be taken should also have toilets close by. These include assembly halls and sports halls. <p>Avoid:</p> <p>Drinking water facilities should not be sited in a toilet area.</p>

1.03	Vandalism	<p>Design Consideration Must Include:</p> <p>The following is a list of ideas to help reduce vandalism:</p> <ul style="list-style-type: none"> • Cubicle doors with sturdy hinges and double bracing on both sides. • Push-button or foot-operated flushes or sensor operated flushes. • Concealed plumbing systems with tamper proof fastenings. • CCTV should only be provided where required under the council’s CCTV Policy. • A mixed set of toilets (in addition to single-sex toilets) which has separate toilet areas for boys and girls, but unisex wash basin areas. • Compact, self-contained toilet and hand washing rooms discourage groups of pupils from hanging around in them. They also offer accessibility and extra privacy. They may, however, increase the chance of more than one pupil entering the toilet. • Provide attractive indoor social areas. If pupils have to spend breaks outside, even when it is cold, they will naturally want to escape and toilets provide a place to congregate. • Involve the pupils in design ideas and choosing fixtures and fittings and colors.
1.04	Pupils with Disabilities	<p>Design Consideration Must Include:</p> <p>Pupils with disabilities must have fully accessible toilets, which can be accessed quickly and easily from wherever they are in the school.</p> <p>Access to toilets for those with disabilities can be with an electronic key, to prevent other pupils using the toilets.</p> <p>Cubicles must be big enough to maneuver a wheelchair. They need to have handrails fitted at appropriate heights. They must also be able to accommodate a hoist and a member of staff (as some users will need assistance).</p> <p>Some users will have poor grip, co-ordination problems and/or limited mobility. Taps and soap dispensers need to take account of this.</p> <p>The requirements of pupils with other special needs should also be considered e.g. those with health conditions such as Crohn’s disease, Ulcerative Colitis, IBS and cystic fibrosis, as well as girls during periods of menstruation and any pupil with temporary or long-term continence problems. All require easy access to private toilets with their own washing facilities and appropriate disposal facilities. Some pupils with learning difficulties may find it hard to locate toilets that are far from classrooms.</p>

1.05	Hygiene	<p>Design Consideration Must Include:</p> <p>Toilets should be designed to facilitate cleaning and minimise places where dirt and germs can build up. This includes:</p> <ul style="list-style-type: none"> • Concealing pipes and plumbing • Choosing floors and materials which are easy to clean and with continuous surfaces • Avoiding sharp corners and sharp edges between floor and walls • Minimising joints and trims <p>Hygiene is also important on the way out of a toilet area so that hands are not re-contaminated after washing. Washrooms can be designed without outer doors which eliminates the need for handling doors and avoids pupils feeling shut in and cut off in a washroom.</p>
2.00	Layout	
2.01	Nursery	<p>Design Consideration Must Include:</p> <p>Consideration should be given to the following:</p> <ul style="list-style-type: none"> • WC pans and WHB's should be set at a height appropriate for pre-school children. • Where possible cubicles should be large enough for an adult to accompany the child and assist as necessary. • Cubicle doors should be half height to allow peer privacy but allow adult supervision where necessary. • Location of toilets in nursery need to be considered. The toilets need to have easy access from play rooms, but have a two-door separation from areas where food is prepared or consumed. • An area of wall where a changing bench may be installed. • LST radiators should be used. • Finger guards should be applied to doors into toilets.
2.02	Primary	<p>Design Consideration Must Include:</p> <p>Consideration should be given to the following:</p> <ul style="list-style-type: none"> • Aim for communal open plan wash hand area • hand Ease of access to toilets access from within classrooms and also from recreation areas. • Positioning additional toilets next to changing rooms, dining halls, playgrounds etc. • Avoiding toilets at the outer reaches of the school. • Providing at least one all-in-one toilet cubicle in each toilet facility with its own washing facilities within floor to ceiling cubicles and doors, accessible to those with disabilities. These offer enhanced privacy. They can be sited directly off circulation areas. Provision for obtaining sanitary products should be provided, ideally within more than one toilet.

2.03	Secondary	<p>Design Consideration Must Include:</p> <p>Consideration should be given to the following:</p> <ul style="list-style-type: none"> • Positioning smaller sets of toilets within the heart of a school near staff areas, such as opposite offices or staff work rooms. • Positioning at least one of the sets to allow easy access from outdoor spaces used during lunch and break times. • An open plan approach incorporating clear sight lines. • Eliminating hidden corners. • The adoption of hand-washing areas open to circulation areas or separated by a glass wall and so easily visible to staff and pupils which allows for passive supervision of the toilets eliminating entrance and exit doors. • Ensuring there are no views directly into cubicles, urinals or sanitary disposal/vending machines. • Providing at least one all-in-one toilet cubicle in each toilet facility with its own washing facilities within floor to ceiling cubicles and doors, accessible to those with disabilities. These offer enhanced privacy. They can be sited directly off circulation areas.
3.00	Design Specifics	
3.01	Colour	<p>Design Consideration Must Include:</p> <p>Pupils should be consulted on colour choices, ideally with colour samples. They may need to be guided to think about the effect colours can have on our mood and behaviour. It is wise to consult pupils on other aspects as well as colour; pupils can rightly feel marginalised when their only input into the toilets is the choice of colour.</p>
3.02	Floors	<p>Design Consideration Must Include:</p> <p>The floor surface should be easy to clean with readily available products and as smooth as possible while still meeting slip-resistance requirements.</p> <p>The material should be impervious to water, with watertight joints to enable it to be washed down without water passing through to the sub floor.</p> <p>The floor finish should have an integral 100mm high coved skirting in matching material and finish so that the floor can be washed without risk of damage to the wall finish. Avoid sharp angles that make cleaning more difficult.</p> <p>Flooring should run under IPS units to ensure that any leaks behind are identified quickly. Any flooring behind IPS units should run to falls to ensure that water does not get trapped behind the IPS unit.</p>

3.03	Walls	<p>Design Consideration Must Include:</p> <p>Materials should be as smooth as possible and easily cleaned with readily available products.</p> <p>Consideration should be given to Whitewall or similar products (providing good colour contrast with sanitaryware can be achieved.) e.g. to urinal and wash hand basin splash backs.</p> <p>Avoid:</p> <p>Ceramic tiling.</p>
3.04	Ceilings	<p>Council Standard:</p> <p>If suspended ceilings are used, then each tile must be clipped in place.</p> <p>Design Consideration Must Include:</p> <p>Special attention should to be paid to the specification of ceilings. These need to be robust and easy to clean and maintain. Access panels should be visible and lockable and cannot be opened by pupils.</p>
3.05	IPS Panels	<p>Design Consideration Must Include:</p> <p>Integrated Plumbing System (IPS), where panels conceal cisterns and pipes, should be used.</p> <p>Full access must be available for maintenance and repair to services and pipework concealed by IPS systems. Including a tell-tale system to alert if there is a leak in the concealed pipework.</p> <p>IPS systems must be designed in such a way as to ensure that leaks in concealed can be detected quickly. This could be achieved by leaving a gap or “mouse-hole” at the bottom of the unit. Flooring should run under the IPS system but flooring behind must be to falls to stop water collecting behind the IPS system.</p> <p>IPS access panels should be securely fixed to eliminate the risk of them falling on pupils. This can be achieved by:</p> <ul style="list-style-type: none"> • Hinged fixing systems • Lift on/lift off panel clips <p>Due to the heavy weight of IPS Panels, the maximum panel size should be 1000mm x 700mm</p> <p>The framing arrangement for the IPS panels should not restrict access to the cistern.</p> <p>Avoid:</p> <p>Push fit panel fixings must not be used.</p>

3.06	Cubicles & Cubicle Doors	<p>Council Standard:</p> <p>Cubicles should be constructed from solid grade laminate (SGL). Cubicles with chipboard cores that are only faced with a hard-wearing surface such as High-Pressure Laminate (HPL) or Melamine Faced Laminate (MFL) should not be used.</p> <p>Use standard cubicle lock mechanism.</p> <p>https://www.commercialwashrooms.co.uk/products/toilet-cubicle-fittings/toilet-cubicle-locks/replacement-toilet-cubicle-lock-and-cover-plate-horizontal-vertical</p> <p>Design Consideration Must Include:</p> <p>Cubicles for Nursery school children should be at an appropriate height.</p> <p>Cubicles for Primary & Secondary school children should be designed to minimize the gap between the cubicle and the ceiling</p> <p>Cubicles and doors should be spaced no more than 50mm off the floor finish level to allow access for cleaning.</p> <p>There should not be gaps where the hinges are.</p> <p>Doors need to be securely fixed to the walls or partitions, so that a door cannot be lifted off its hinges. Door closures should be robust and close gently against the frame to avoid trapped fingers.</p> <p>All doors (with the exception of cubicles for those under the age of five) need locks which are easy to operate from inside the cubicle. Pupils should not be able to easily unlock doors from the outside (i.e. not with the use of a coin). A special tool or key must be available to open doors from the outside, for teachers and/or prefects to use in an emergency. Schools need to consider the storage location of the key if the toilets are not located close to where staff are sited.</p>
3.07	Doors	<p>Design Consideration Must Include:</p> <p>Vision panels should be provided in corridor doors (and internal doors) that provide a view from the corridor of the hand washing and cubicle areas.</p> <p>Vision panels should be located so as the urinal areas cannot be seen.</p>

3.08	GLASS MIRRORS	<p>Council Standard:</p> <p>Mirror material: Float glass, silvered to give maximum reflection, free from tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions.</p> <ul style="list-style-type: none"> - Thickness: 6 mm - Backing: Polypropylene safety film - Edge treatment: Polished bevel <p>Design Consideration Must Include:</p> <p>Fixing method: Mirror adhesive spread over the extent of the foil backing</p> <p>Installation: Fixed accurately and securely without overtightening fasteners, to provide a flat surface giving a distortion free reflection.</p>
4.00	Sanitaryware	
4.01	Toilet Pans & Cisterns	<p>Design Consideration Must Include:</p> <p>All toilets should have seats fitted with robust fittings.</p> <p>Toilet seats with an opening at the front should be provided in Boys toilets...</p> <p>Top fitting toilet pan seats and lids should be fitted</p> <p>Toilet lids should be fitted to toilet pans.</p> <p>The cistern and associated pipe work should be concealed within the IPS system.</p> <p>Split siphons should be specified for ease of maintenance.</p> <p>The flush needs to be robust and easy to use.</p> <p>Avoid:</p> <p>Stainless steel toilet pans should not be used.</p> <p>Sensor operated touch-free fixtures should not be used.</p> <p>Cantilevered toilet pans should NOT be specified.</p>

4.02	Urinals	<p>Design Consideration Must Include:</p> <p>Urinals should be positioned so they can't be seen from outside the toilets when the door is open.</p> <p>Mirrors should be positioned so they don't enable people to see urinals or cubicles from the outer door.</p> <p>People at washbasins should not be facing those at urinals, or facing a mirror which shows urinals.</p> <p>All windows should have frosted glass if urinals or the inside of a cubicle can be seen from them.</p> <p>Urinals should be individually screened.</p> <p>Urinals should have a target to aim at e.g. fly</p> <p>Avoid:</p> <p>Trough (communal) urinals should not be used.</p>
4.03	Wash Basins	<p>Design Consideration Must Include:</p> <p>Consideration should be given to multi-tap wash trough hand washing facilities.</p> <p>If a row of washbasins is to be used then consideration should be given to vanity units with lockable storage space to conceal pipe work.</p> <p>Splash backs should be impervious to water and have as few joins and grouting as possible; ideally one unbroken surface to avoid the dirt, germ and mould build up typical of grouting between tiles. The joint between the wash basin and the splash back should be sealed against water and dirt.</p> <p>Avoid:</p> <p>Plugs should not be provided.</p>

4.04	Taps	<p>Council Standard:</p> <p>Pillar taps (hot & cold) self-closing push button non-concussive with anti-vandal nozzle, chrome plated. Armitage shanks Brassware contract Sandringham range or Avon range.</p> <p>Design Consideration Must Include:</p> <p>If push taps are used, they need to stay on long enough for pupils to wash their hands properly. Careful consideration must be made for tap provision in nurseries.</p> <p>For safety, the water supply to the taps should be at a pre-mixed temperature of a maximum of 41oC as set out by the Thermostatic Mixing Valve Association.</p> <p>This should be done with Horn Valves under the sink unit.</p> <p>Washrooms taps should be labelled as non-drinking water. A small general notice in the washroom area will suffice.</p> <p>Taps should not be more than 2m from the thermostatic mixing valve.</p> <p>Avoid:</p> <p>Sensor operated touch-free fixtures should not be used.</p> <p>Flexible connection hoses should not be used.</p>
5.00	M&E Services	
5.01	Lighting	<p>Design Consideration Must Include:</p> <p>Toilets should be adequately lit.</p> <p>Ensure adequate lighting within individual cubicles.</p> <p>Incorporate natural lighting where possible.</p> <p>Occupancy sensing lighting can be used but sensors must cover movement within individual cubicles to avoid blackout when occupied.</p> <p>Key switches should be considered to stop pupils deliberately switching off lights.</p>
5.02	Ventilation	<p>Design Consideration Must Include:</p> <p>Mechanical ventilation systems are required in all toilet areas. Toilets must not be vented by opening windows alone.</p> <p>If windows need to be opened for ventilation, they should not be placed in view of urinals or the inside of a cubicle.</p> <p>Toilet cubicles with floor to ceiling partitions and doors to enhance pupil privacy, will need ventilation systems within each cubicle.</p> <p>Toilets need to be sufficiently heated to be comfortable in winter. Toilets that rely on open windows for ventilation will be too cold in winter.</p>

6.00	Consumables	
6.01	Soap Dispensers	<p>Design Consideration Must Include:</p> <p>Consult with FM Services on the provision of soap dispensers. Contact FM Services.</p>
6.02	Hand Drying	<p>Design Consideration Must Include:</p> <p>Consult with FM Services on the provision of hand drying facilities. Contact FM Services.</p>
6.03	Toilet Paper Dispensers	<p>Design Consideration Must Include:</p> <p>Consult with FM Services on the provision of toilet paper dispensers. Contact FM Services.</p>
6.04	Sanitary product disposal and dispensers for girls	<p>Design Consideration Must Include:</p> <p>Consult with FM Services on the provision of sanitary product dispensers and disposal. Contact FM Services.</p>

APPENDIX 3	Grid-connected Photovoltaic System Design Guide
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1.00	General	
1.01	Preliminary requirements;	<p>Prior to the commencement of design, the following checks shall be made as a prerequisite;</p> <ol style="list-style-type: none"> 1. Structural information 2. Asbestos information 3. Lightning protection 4. Electrical point of connection
1.02	Project compliance	<p>Design Considerations Must Include</p> <p>Full compliance with;</p> <p>Engineering Recommendation G99 (current edition) Requirements for the connection of generation equipment in parallel with public Distribution Networks Operators (DNO)</p> <p>Electricity at work regulations 1989</p> <p>Electricity Safety, Quality and Continuity (Amendment) Regulations 2006.</p> <p>BS EN 62446 (current edition) Grid connected photovoltaic systems - Minimum requirements for system documentation, commissioning tests and inspection</p> <p>BS 7671 (current edition) Requirements for electrical installations (all parts – but in particular Part 7-712 Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems).</p> <p>MCS – Guide to the Installation of Photovoltaic Systems</p> <p>RC62 - Recommendations for fire safety with PV panel installations</p> <p>IET Code of Practice for Grid-connected Solar Photovoltaic Systems</p> <p>BS EN 61215 in the case of crystalline types</p> <p>BS EN 61646 in the case of thin film types</p> <p>BS EN 61730 for PV module safety qualifications</p> <p>BS 62305-part 1-4 Protection against lightning.</p> <p>Loss Prevention Council (LPC)</p> <p>Building Research Station (BRE) digest recommendations</p> <p>Building Services Research and Information Association (BSRIA) recommendations and guides</p> <p>Local By-Laws and/or Regulations.</p> <p>Manufacturers’ instructions and recommendations for installation/testing</p> <p>Government (formerly PSA) specifications</p> <p>Health and Safety at Work Act</p> <p>CDM Regulations</p> <p>Health Technical Memoranda (HTMs)</p> <p>Health Building Notes (HBNs)</p> <p>HSE Approved Code of Practice documents and guidelines</p> <p>Radiocommunications Agency</p> <p>All modules shall carry a CE mark.</p> <p>All solar PV systems installed on a building must comply with the requirements of the Building (Scotland) Regulations (current edition).</p>
1.03	Planning Permission and Building Warrant	<p>Design Considerations Must Include</p> <p>It shall be the responsibility of the installer to submit to the local planning authority the final detail of design, layout arrangement, structure locations, form, dimensions, structure heights and any required alterations to existing soft landscaping all as required to clear all arising Planning in Principle consent Conditions.</p> <p>For the avoidance of doubt, responsibility to secure the final planning approval lies with the installer. Payment of application fees and any other costs associated with this process will be the responsibility of the installer.</p>

		The Building warrant application and obtaining Building Warrant Approval is the responsibility of the installer. Payment of application fees and any other costs associated with this process will be the responsibility of the installer.
2.00	Array Location	
2.01	Building Roof mounted Arrays	<p>Design Considerations Must Include</p> <ul style="list-style-type: none"> • The relevant planning authority should be consulted at an early stage to determine if planning permissions are required. • If the solar PV panels are being mounted on the roof/terrace of an existing building, a structural engineer's certificate is to be obtained and submitted with Building Warrant applications. • Further, ecological survey is to be carried out to ensure minimum disruption to BATS and birds. • A risk assessment is to be carried out for the lightning and surge protection of the proposed solar PV installation at the early stage of the design. • A risk assessment is to be carried out and fall mitigation measures are to be put in place where the roof edge protection is absent. • The building warrant is to be applied for and consent received from the authority. • In properties that were constructed before the year 2000, the asbestos survey is to be carried out as per the guidance of WLC's asbestos compliance officer. <p>Avoid: Direct roof penetration shall not be permitted.</p>
2.02	Car park Canopy mounted arrays	<p>Design Considerations Must Include</p> <p>The PV arrays shall be mounted above the canopy. The mounting detail shall be delivered as part of the design.</p> <p>The proposed design solution must also include detail on foundations proposed. It is for the designer to identify and configure the spaces which they propose to be covered by the canopies. However, car park orientation and layout, including number of parking bays available must remain unchanged.</p> <p>The designer must outline visually:</p> <ul style="list-style-type: none"> • The types of frame structure and type of pitch across each space/bank of spaces, including outlining spacing of span (number of spaces), structure heights to the highest point and whether the structure is braced or unbraced. <p>Submitted design must also clearly outline areas on the plan and the type of canopy which is proposed, e.g.</p> <ul style="list-style-type: none"> • Mono-pitch structure over single rows or double rows and type of frame (e.g. T frame or V frame) • Duo-pitch/gull wing structures over double rows and type of frame (e.g. T frame or V frame). <p>Each carport and canopy type proposed must provide information including, but not limited to:</p> <ul style="list-style-type: none"> • Preferred Orientation • Maximum Span • Hidden Foundation (Yes/No) • Bollard Function Integrated (Yes/No) • Loss of Existing Parking Bays (Yes/No) – if yes, please state number • Integrated Inverter (Yes/No) • Integrated EV Charger (Yes/No) • LED Lighting (Yes/No) – if yes specify average lux level • Lightning protection • Earthing • Cabling and containment • Drainage Gutter (Yes/No) • Drainage Pipe (Yes/No)

2.03	Ground mounted arrays	<p>Design Considerations Must Include</p> <ul style="list-style-type: none"> • The relevant planning authority should be consulted at an early stage to determine if planning permissions are required. • If the solar PV panels are being mounted on ground, a GPR survey and SI investigation is to be carried out by the installer. • Further, ecological survey is to be carried out to ensure minimum disruption to ecology. • The building warrant is to be applied for and consent received from the authority.
3.0	Electrical distribution	
3.01	Connection to Existing Building Electrical Infrastructure	<p>Design Considerations Must Include</p> <p>Provide sufficient outgoing ways for use and as spare ways extension sections will require to be designed, supplied, installed, tested and commissioned to the existing switchboards. Consideration of installation location to consider future expansion. Requirement for equipment to have additional devices and circuits fitted safely without the need to isolate the distribution board. All incoming supplies will be fitted with metering allowing remote viewing and recording of the information.</p> <p>All PV array junction boxes shall carry a warning label indicating that active parts inside the boxes may still be live after isolation from the PV inverter.</p> <p>Emergency isolation points which can be locked in the open position only shall be provided as close as possible to the AC inverters and at the point of integration to the main LV distribution system and at the solar panel end. Dual supply warning labels shall be provided in appropriate locations to raise the awareness of the need to isolate more than one source of supply.</p> <p>Provision shall be made for the PV system to disconnect itself from the DNO system in the event of a network fault.</p> <p>Array switch dis-connectors in non-conductive FRP pad-lockable enclosure as recommended in BS 7671:2018:462 and MCS 2.1.12 shall be provided near the PV array. Switchboards shall be of steel construction and to BEAMA Form 4; Type 6 as minimum. The switchboards and distribution boards shall be fully labelled. Electrical schematic drawing shall be framed and displayed in each switch room.</p> <p>Avoid:</p> <p>The use of spare feeders to connect the PV supply shall not be allowed.</p>
3.02	Cabling	<p>Design Considerations Must Include</p> <p>The double insulated single core PV string cables from (beneath or beside) each PV module up to the switch disconnector enclosure shall be drawn through fully enclosed galvanised cable trunking. Provision shall be allowed for adequate gradient and draining out water from within the containment. Weather resistant neoprene grommets and cable sleeves shall be used to protect cable at all cable entry points. DC isolators and DC surge protection devices shall be installed within FRP enclosures as close as possible to the PV array. If multiple arrays are installed, separate FRP enclosures shall be provided as required.</p> <p>PV string cables, PV array cables and PV DC main cables shall be selected to minimise the risk of short-circuits and earth faults. The area of all wiring loops shall be kept as small as possible to minimise voltage induced by lightning. Long runs of cable (exceeding 20m) from the enclosure to the inverter shall be through XLPE/LSZH steel wire armoured SWA as recommended in MCS clause 2.1.4.2c in suitable heavy-duty galvanised cable trays with cover. Cable trays run vertically and horizontally on external areas shall be provided with cover and bonded to the lightning protection air termination tapes.</p> <p>Internal DC cable shall be installed in separate metal trunking.</p> <p>The AC power cable from the inverter to the electrical distribution board shall be through multicore XLPE/SWA/LSZH cable with suitably sized separate CPC. All internal AC cables shall be run through dedicated galvanized steel cable trays. Fire</p>

		<p>stop arrangement shall be made while penetrating fire rated compartment. Dual Screw' terminals are preferred for incoming stranded cable connections (meter tails and the like). Labelling shall be provided at every 5m on straight runs and at every bend as per MCS recommendation.</p> <p>In external ground surface, the scope of responsibility shall include for the design and installation of in ground trenching and ducting for all required services. These shall include routes between the existing buildings and the canopies / PV Arrays, and the EV chargers etc. Ducts shall be separated for LV and ELV cabling. All ground surfaces requiring to be dug up as part of this process and canopy installation to be fully reinstated in a condition to match existing.</p> <p>Avoid: The use of existing containment for running PV cable shall not be permitted.</p>
4.0	Photovoltaic system	
4.01	PV Arrays	<p>Design Considerations Must Include</p> <p>The PV arrays shall be mounted on ground, on roof or above canopy as per project requirement. The mounting detail shall be delivered as part of the design.</p> <p>The wind speed and loading on the PV array shall be calculated prior to design completion and shall take account of specific local conditions in accordance with BS EN 1991-1-4 and BRE Digest 489.</p> <p>Design calculations must highlight maximum output of PV annually over 20 years (including manufacturer degradation percentages). The proposed PV output and sizing of energy storage system (where applicable) must make clear how the proposed solution was reached and how this meets the Council's requirements to optimise the site.</p> <p>The system shall distribute energy generated by the solar PV to meet the electrical demand of the identified site use currently and as well as EV charging (in specific cases) demand up to the optimum possible.</p> <p>There is currently no intention by the council to export surplus power to the grid. The PV installation shall be designed, supplied, installed and commissioned to optimise renewable generation output and the following detail must be outlined:</p> <ul style="list-style-type: none"> • Minimum annual energy yield (kWh) – this figure to be outlined over 20 years including % degradation each year • Area of PV array (m²) – The installer is responsible for optimising the areas, considering space for drainage and access, etc. <p>For the avoidance of doubt:</p> <ul style="list-style-type: none"> • Minimum efficiency of PV panels (%) to consider build-up of dirt – 19% • Minimum average PV panel output over 1 calendar year (kWh) – 128.7kWh/m²?? • Minimum efficiency of inverters (%) – 85% • The PV array load shall not be oversized beyond 20% of the inverter load. <p>The complete PV system shall be designed, manufactured, installed, set to work and commissioned by a Microgeneration Certification Scheme (MCS) registered specialist and shall comply with BS IEC 62548 and BS 7671.</p> <p>The following CIBSE weather file shall be used for PV system calculation and design: CIBSE Edinburgh TRY 05.</p> <p>The complete PV installation shall include an array of PV panels, inverters, isolation switches, synchronising equipment together with all required ancillary components. The complete system shall comply with BS IEC 62548.</p> <p>The PV modules shall be of the following type:</p> <ul style="list-style-type: none"> • Mono-crystalline <p>The PV modules shall be certified as having been type-tested as specified in BS EN 61215 to ensure each module can withstand harsh weather conditions over a prolonged period whilst retaining integrity.</p> <p>The PV modules shall be a MCS certified product. The PV cells shall have a 25 years' product warranty.</p>

		<p>The PV modules shall have a positive output tolerance of +5/-0% and their rated output shall be guaranteed to remain within 90% of the specified output within 12 years of delivery to site, and 80% of the specified output within 25 years of delivery to the site.</p> <p>Each module shall include bypass diode bridges to prevent individual solar cells from overheating. Adequate heat dissipation shall be provided under the conditions of anticipated maximum solar radiation.</p> <p>The PV modules can be connected in series up to the maximum allowed operating voltage of the PV modules or the inverters, whichever is lower.</p> <p>Contractors should ensure that solar photovoltaic panels should not be manufactured in, or be manufactured from materials sourced from the Uyghur region of China or any other areas linked to modern slavery practices. More information can be found at https://www.shu.ac.uk/-/media/home/research/helena-kennedy-centre/projects/pdfs/evidence-base/in-broad-daylight.pdf</p>
4.02	Inverters	<p>Design Considerations Must Include</p> <p>Inverters shall have a 12-year minimum life cycle.</p> <p>Design should also consider optimising the number and sizing of inverters considering life cycle replacement costs.</p> <p>The inverters shall be certified to meet BS EN IEC 61000-6-3 and BS EN IEC 61000-6-1 for electromagnetic compatibility (EMC).</p> <p>For the selection of inverters, the ambient summer condition shall be taken as 30°. The inverters shall be located such that they do not overheat.</p> <p>The voltage and frequency limits shall not be capable of adjustment by unauthorised personnel. The protection shall ensure that the inverter disconnects from the distribution system within 5 seconds and shall not reconnect until at least 3 minutes after the supply has been restored to within the voltage and frequency limits.</p> <p>The inverters shall be complete with an isolating transformer. The enclosure protection for the inverters shall be at least IP44 (for indoor) and IP 65 to be mounted within IP rated protection enclosure (for outdoor).</p> <p>Inverters with integral surge protection shall have a provision to access the surge protection devices without opening the inverter unit and thereby invalidating the manufacturer's warranty. The integral surge protection devices will have to be coordinated, tested and certified by the LPS and SPD specialist. In the absence of this provision, additional external surge protection devices shall be provided in the DC and AC side at close proximity to the inverter by the surge protection specialist.</p> <p>Avoid:</p> <p>An inverter should not be mounted on an inside wall that has a lightning protection system down conductor running just the other side of the brickwork on the outside of the building.</p>
5.0	Lightning Protection and Surge Protection	
5.01	Lightning Protection	<p>Design Considerations Must Include</p> <p>The lightning protection specialist shall be consulted at an early stage in the design to carry out a risk assessment for lightning and surge protection of the solar PV installation.</p> <p>If the building does not have a lightning or surge protection system then the advice of the specialist shall be sought in providing the requisite protection to the building as per the risk assessment.</p> <p>If the building is fitted with a lightning protection system (LPS), a suitably qualified person should be consulted as to whether, in this particular case, the array frame should be connected to the LPS, and if so what size conductor should be used.</p>

		<p>Where an LPS is fitted, PV system components should be mounted away from lightning rods and associated conductors (see BS EN 62305). The PV frames and supports shall not be used as air termination for the purpose of discharge of lightning current.</p> <p>For all array types, allowance shall be made to protect the PV panels from direct lightning strikes as detailed in BS 62305-part 3 Fig E.33.</p> <p>The manufacturer's/ specialist installer's instructions for both the PV modules and the equipment to which the PV array is connected must be considered in determining the most appropriate earthing arrangement.</p> <p>On completion of the installation the lightning protection installations and surge protection systems will be certified by a registered LPS installer.</p> <p>Avoid</p> <p>The PV frames and supports shall not be used as air termination for the purpose of discharge of lightning current.</p>
5.02	Surge Protection	<p>Design Considerations Must Include</p> <p>Surge protection devices built into an inverter may only be type 3 and in most cases not accessible for annual testing hence additional (type 1 or 2) devices on the D.C. and A.C. side shall be provided. To protect the A.C. system, surge suppression devices may be fitted at the main incoming point of A.C. supply (at the consumer's cut-out). To protect the D.C. system, surge suppression devices can be fitted both at the inverter end of the D.C. cabling and at the array end inside a FRP enclosure. To protect specific equipment, surge suppression devices may be fitted as close as is practical to the device.</p> <p>Where the distance between the PV array and the inverter is <10m a single SPD suffices, mounted as close as possible to the inverter. And where the distance is >10m, two SPDs should be installed, one close to the inverter and the other close to the PV array.</p> <p>Where the distance between the service connection point (Main Switchboard) and the inverter is <10m, a single SPD should be installed at the service connection point. Where the distance is >10m, two SPDs should be installed one at the service connection point and one close to the inverter. The surge protection devices shall be coordinated tested and certified by the surge protection specialist. All surge protection devices shall have a warranty of five years.</p>
6.0	Earthing and Bonding	
6.01	Earthing and Bonding	<p>Design Considerations Must Include</p> <p>The PV system installer shall employ a specialist to design, supply, install and test a complete earthing system in compliance with BS7671 and BS 7430 - Code of Practice for Earthing. Earthing shall be provided to both the DC and AC of the electrical systems. The PV frame and mounting structure shall be bonded to the building earthing system in accordance with BS 7430.</p> <p>For ground mounted systems the PV frame and mounting structure shall provide the TT earthing system for the LV supplies. Further, a Type B earthing arrangement as proposed in the BS 62305-3 E5.4.2.2 and a separate earth bar shall be provided near the AC distribution board.</p>
7.0	Metering and Telemetry	
7.01	Metering	<p>Design Considerations Must Include</p> <p>MID (Measuring Instruments Directive) certified Class C meters shall be provided to the PV installation so that the daily energy production of solar power can be monitored effectively and data recording must be compatible with West Lothian Council's existing system to enable integration of data.</p> <p>West Lothian Council currently uses Meteronline for solar PV monitoring. Generation meters should be GSM compatible and, where</p>

		possible, be pre-configured for connection to Meteronline's portal. More information is available at https://metermanager.co.uk/ Avoid Current transformers shall be firmly mounted in enclosure. They shall not be placed within containment or left exposed.
8.0	Software	
8.01	Software Time Function	Design Considerations Must Include The installer must obtain on behalf of the Client all appropriate licences, permissions, copyright waivers, rights of use and the like from the owners of software rights and ensure that the Client is properly registered with the software supplier for support and appropriate updating. Software and hardware updates, specifically regarding energy management systems is to be included within the contract. Application software shall be in compliance with BS 7649 The installer must ensure that all equipment utilising a time and/or date function, supplied and used on the project, meets the following conformity requirements: All time and date set functions in either software or firmware shall use a minimum 64bit integer to determine the current time and date as well as any processes or events that rely on time and/or date settings No value for date will cause any interruption or adverse effect in performance Where existing equipment is reused, the date and time functionality and performance must be verified to ensure it utilises a minimum 32bit integer to determine the current time and date as well as any processes or events which rely on time and/or date settings. Correct time and date functionality shall be maintained for a minimum of 25 years after practical completion Leap years must be recognised as a leap year
9.0	Detail design	
9.01	Design deliverables	Design Considerations Must Include The design deliverable within the scope of this project shall be to prepare and submit the design documents which include, detail design stage design drawings, specifications, calculations, risk assessment, bill of materials, H&S documents and supporting design documentation. The design drawings shall include but not be limited to; <ul style="list-style-type: none"> • Site plan to scale 1:1500 @ A0 • Solar PV Panel Layout plan to scale 1:100 @ A1 • EV charging unit layout to scale 1:100@ A1(where're required) • Solar PV canopy elevation 1:50@ A2 • Switch room equipment layout to scale 1:50@ A2 • Cable route layout plan to scale 1:500@ A1 • Solar PV schematic drawing NTS @ A1(as per the employer's template drawing) • EV charging / storage schematic drawing NTS @ A1(where're required) • Lightning protection layout to scale 1:100 @ A1 • Surge protection layout to scale 1:100 @ A1 • External lighting layout to scale 1:100 @ A2 All of above in CAD and pdf format The design calculations shall not be limited to but include; <ul style="list-style-type: none"> • Solar PV yield • Annual estimated energy yield. • Sizing of invertor • Electrical distribution calculation • LPS risk assessment • External lighting calculation. Segregation category. <ul style="list-style-type: none"> • Circuit voltage and number of phases.

		<ul style="list-style-type: none"> • Impedance equivalent to the prospective short circuit current at the origin of the cable. • Cumulative volt drop at the origin of the cable. • Earth loop impedance Z_s at the origin of the cable. • Rating, type, and classification of the over-current / short circuit device protecting the cable. • De-rating factors for the most onerous installation method along the length of the cable:
10.0	Inspection and Testing	
10.01	Inspection and Testing	<p>Design Considerations Must Include</p> <p>The electrical installation shall be fully inspected and tested in accordance with BS 7671, the recommendations of IET Guidance Note No. 3: Inspection and Testing (latest edition) and HSE Publication GS 38.</p> <p>Inspection and testing shall only be performed by authorised personnel.</p> <p>All test instruments shall comply with BS EN 61010 and be covered by a current test and calibration certificate.</p> <p>Installer shall submit a risk assessment and method statement for approval, prior to starting work.</p> <p>All inspection and test results shall be recorded using proforma documentation (test certificates and schedules) complying with BS 7671.</p> <p>Provision shall be made for all inspection and testing activities to be witnessed.</p> <p>The period of notice for witness testing shall be 7 working days.</p> <p>If most of the inspection and testing activities are not witnessed, allowance shall be provided for 10 % of the inspection and testing activities to be repeated for witness testing.</p>
11.0	O&M manuals	
11.01	Manuals, HS and as fitted drawings	<p>Design Considerations Must Include:</p> <p>To be in accordance with the latest version of BSRIA Building Manuals & Building User Guides” and in an electronic format.</p> <p>O & M manuals</p> <p>Health and Safety documents</p> <p>Test certificates and commissioning certificates/records</p> <p>Manufacturer’s warranty certificates with supporting evidence of date of delivery/purchase.</p> <p>Standard and emergency operating procedures</p> <p>Recommended Periodic Maintenance Schedules/ program</p> <p>List of spares</p> <p>As-fitted drawings</p> <p>All drawings shall be supplied in AutoCAD/Revit and pdf formats</p> <p>Asset register with images of all apparatus/device.</p>