

DIRECTORATE OF ESTATES & FACILITIES**PROCEDURE AND INFORMATION MANUAL****EPM PM28 DESIGN GUIDE FOR WC REFURBISHMENTS AND INSTALLATIONS**

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1 Introduction

- 1.1 The purpose of this document is to set out the design standards for WC refurbishments and new WC installations at the University of Manchester.
- 1.2 These standards reflect best practice in terms of producing a durable, sustainable and maintenance friendly product, which is both inclusive and accessible in design.
- 1.3 The WC facilities at the University of Manchester should be of a high aesthetic standard, reflecting our aim to be a world leading educational establishment. The facilities should also be highly functional. Therefore both form and function are to be prioritised in the design of WC facilities, to achieve excellence in the student experience, as well as best value for the University.

2 General principles

- 2.1 Before any WC refurbishment works are carried out, the existing provision of WC facilities in the building should be reviewed by the design team to ensure that we have sufficient gender split and disabled WC provision.
- 2.2 The provision of WC and shower facilities must be compliant with the Workplace (Health, Safety and Welfare) Regulations 1992. A derogation must be made if these requirements cannot be met.
- 2.3 Provision of shower facilities must be considered for every WC refurbishment / install. Increased shower provision gives staff and students better welfare facilities and promotes sustainable travel, such as cycling and running.
- 2.4 The feasibility of all gender WCs should be reviewed for every WC refurbishment / install, as all gender WCs provide more inclusive facilities.
- 2.5 Any proposed equal or approved alternative manufacturer or range shall be done so in writing by the successful contractor, after the tender approval. The proposed alternative should meet all the standards achieved by the specified item and all cost savings should be submitted at the time of proposal. No other manufacturer should be used unless approved by the Client Services Unit representative.
- 2.6 All toilet refurbishment schemes are to have a pre and post drainage survey undertaken by an experienced drainage specialist, both prior to any demolition or strip out of existing sanitary services, and once refurbishment works are completed.
 - 2.6.1 The survey should include a complete CCTV inspection of the horizontal and vertical stacks to ascertain the condition of existing pipes, joints, couplings, gullies and manholes. The survey should be presented to the CSU Building Surveying team in electronic format with the footage supplied on DVD or USB Flash Drive.
 - 2.6.2 The survey should be discussed with the CSU Building Surveying team and any remedial works undertaken to allow a free flowing drainage system.
 - 2.6.3 All new drainage systems are to have rodding points on bends and at the entry point into the stack, and a removable cap at the end of any horizontal run.

3 Sanitary ware

- 3.1 Wall hung toilets should only be specified if they are fixed back to a suitable frame. If wall hung toilets are to be specified then details of the fixing methodology should be provided in the Design Checklist for University of Manchester WC Refurb / Install Works (Appendix B).
- 3.2 Toilet seats shall be soft closing.
- 3.3 Dual flush for toilets allows for water saving opportunities; however the quality of the flush mechanism is very important. Chrome effect plastic flush mechanisms should not be used as they are not durable. Flush mechanisms to be stainless steel or material of equivalent durability.
- 3.4 All toilet flushes must be suitably sized so that they can be operated by people with limited dexterity. (Please refer to No 1. in Appendix A - Photo Examples.)
- 3.5 Basin waste fittings and services should be concealed within laminate vanity units.
- 3.6 All pipework shall be hidden or behind panelling. The exception to this is urinal waste. Urinal waste must be easily accessible due to the frequent access requirement to address blockages. (Please refer to No 2. in Appendix A - Photo Examples.)
- 3.7 Suitable and sufficient access points should be incorporated into the design of any services which are behind panelling.
- 3.8 IPS panels behind toilets should be hinged to prevent panels falling out in the event that the fixing clips fail over time. Hinged access panels are also more straightforward from a maintenance perspective with less manual handling required. (Please refer to No 3. in Appendix A - Photo Examples.)
- 3.9 New pipework and fittings must all match in terms of colour and materials.
- 3.10 A suitable fall should be incorporated onto the sink rim to allow water to drain into the sink and not to track onto the vanity unit.
- 3.11 Sink outlets are to be flush and plug-less.
- 3.12 Sink bases to incorporate a fall towards the outlet to ensure that water drains away effectively. (Please refer to No 4. in Appendix A - Photo Examples.)
- 3.13 Taps should be operable by people with limited strength or manual dexterity.
- 3.14 The University of Manchester do not support the use of sensor taps. Non-concussive or lever taps may be provided where limited dexterity needs to be considered. Further consideration regarding the available pressure may limit the possible use of non-concussive type taps, designers to confirm their suitability. (Further requirement shall be included as per other applicable University policies and procedures including EPM PM07 and EPM HS4.)
- 3.15 Whichever manufacturer and product is selected, consideration **must** be given to how spares can be procured. This is in terms of ease, i.e. ideally a UK based manufacturer, and also in terms of best value.

4 Mechanical Services

- 4.1 This items listed below are not exhaustive of all mechanical requirements. This document shall be implemented in conjunction with all other applicable University policies and procedures including EPM PM07 and EPM HS4.
- 4.2 In the selection and specification of taps and water outlets, care should be taken to select outlets that have a pressure drop that is suitable for the pressure available in the system (i.e. a low pressure tank supplied system should not be provide with percussive taps that required a high minimum pressure). The mechanical design consultant shall ensure close coordination is held with the Architect/Surveyor in respect to tap specification.
- 4.3 Toilet and wash room hand driers shall be provided with variable speed fan speed settings (minimum 3 speeds) and ability to isolate heating element. Max electrical rating of 1250W. Driers shall be 'no touch' operation and surface shall be supplied with anti-bacterial protection to prevent the spread of bacteria (inc MRSA and E.coli). Hand driers shall be complete with washable air filter and be complete with minimum of 5 year on-site warranty. Preferred supplier/model being Warner Howard, Smart-dri. Unless instructed otherwise, all hand driers shall be commissioned on high speed/ heat off. The exception to this will be for noise sensitive areas where low speed/heat on will be the required setting
- 4.4 Thermostatic mixing valves (TMV's) shall be sited as close as possible to the point of use. A single TMV should not serve multiple tap outlets and the mixed water pipework should be kept as short as possible. TMV's for showers and taps should comply with NHS Model Engineering Specification - D08 for Type 3 Valves. BS EN 1111 & 1287. Sufficient access shall be provided to enable regular temperature monitoring to take place with minimal disruption.
- 4.5 Instantaneous 'point of use' electrical water heaters shall not be used to serve cleaners sinks. Where a building's hot water services strategy is delivered via point of use water heaters, an unvented local storage unit shall be supplied.
- 4.6 Where mechanically ventilated, toilets/washrooms shall be under negative pressure to prevent the escape of foul smells. Under cut doors, for make-up air path, will not be suitable for larger air volumes. For velocities over 2-3ms-1 door/wall transfer grilles will likely be required. If the make-up air path is via a protected escape route an intumescent block will not meet the legislative requirements under approved document F of the building regulations. In this case a mechanical fire & smoke damper may be required. For this eventuality please ensure close co-ordination is held with the fire engineer and UoM fire team.
- 4.7 All domestic water service shall be installed in copper tube to BS EN 1057 table X. No plastic pipework shall be used. Pipework finish (i.e. RAL colour, chrome plated) to be agreed with Architect/Surveyor.
- 4.8 Electrical heaters shall not be located directly below hand driers.
- 4.9 All water fittings shall be WRAS approved. Any final connection to showers, wash basins or any potable supply shall not be made with flexible hose connections, due to degradation of the material over a period of time causing potential Legionella & Pseudomonas colony formation.

5 Electrical Services

- 5.1 The design and installation are to comply with the requirements of EPM PM8, unless this specification directly states otherwise.
- 5.2 Supplies for lighting and general power shall emanate from the distribution equipment that serves the local area and not cross any lines of demarcation. Wiring systems shall generally be metallic trunking / conduit with XLPE/LSF singles cable with final connection to luminaires and equipment using XLPE/LSF flexible cable. Fire alarm and emergency lighting supplies should be carried out using the same wiring systems as the existing, soft-skinned cable shall be manufactured by Prysmian or equal and approved.
- 5.3 Lighting design shall be compliant with BS EN 12464-1:2011 and the design should take into account all obstructions such as cubicles and the reflectance values should replicate the to-be-fitted installation. Luminaires should be sited to comply with the lighting design and the ceiling grid layout should be set out to meet this requirement.
- 5.4 The choice of luminaires should provide adequate protection against external influences and be connected using an LCM / Wieland plug or a plug-in ceiling rose, using one outlet per luminaire. Ingress protection shall not be compromised by the installation of fixings or wiring systems.
- 5.5 Luminaires should deliver a minimum efficacy of >120 l/cW and have a correlated colour temperature of 4000k, existing stock from Thorlux, Eaton and Thorn.
- 5.6 Lighting shall generally be controlled using the presence principle using PIR detectors with macro and micro detection, existing manufacturer is Ex-Or. Detector placement should give full coverage of the WC area without blind-spots. A time-out period of 15 minutes should be programmed when commissioned.
- 5.7 Emergency lighting should be provided as an extension of the existing system. Under no circumstances should system types be mixed. LED luminaires shall be used and have an efficacy >100 l/cW. Emergency lighting design and installation shall be carried out in accordance with BS5266-1:2016.
- 5.8 Small power supplies shall be provided with local isolation, as follows:

a.	Hand dryers	High level switched fused connection unit, rear cable entry to the unit.
b.	Extract fans	Local switched fused connection unit or TP fan isolator, adjacent to the fan.
c.	Automatic taps	Local switched fused connection unit, adjacent to the control, ingress protected to IP66,
d.	Electric heater	Local switched fused connection unit, adjacent to the heater.
e.	Water heaters	Local switched fused connection unit, adjacent to the heater, ingress protected to IP66,
f.	WC alarms	High level un-switched fused connection unit, rear cable entry to the unit.

- 5.9 Unless defined as a special location by Part 7 of BS 7671:2018 or by specific risk assessment circuits should not be protected by RCBO devices.
- 5.10 Accessible WC's shall be fitted with Fire alarm VAD/s in accordance with EN54-23:2010. All works associated with the fire alarm shall be carried out in accordance with BS 5939-1:2017 and EPM HS37.
- 5.11 Emergency WC alarms shall be fitted to all accessible WC's with adequate pull cord provision at all points of use. The location of the remote indicator/s should be agreed with CSU prior to Stage 4 design. Existing equipment is manufactured by CTec.

6 Materials and finishes

- 6.1 Cubicles and vanity units should be either SGL (Solid Grade Laminate) or HPL (High Pressure Laminate). MFC (Melamine Faced Chipboard) should not be used.
- 6.2 In buildings which are not accessible to the general public, cubicle partitions to be a maximum of 50mm above the floor, and minimum of 2.4m high, subject to ceiling height.
- 6.3 In public buildings discussion must be had with the CSU Building Surveying team on cubicle heights, to determine the most appropriate design for that particular building.
- 6.4 Cubicle widths must be suitable for a person and dispensers, particularly female WCs where there are feminine hygiene products. Minimum cubicle size is 1640mm x 800mm.

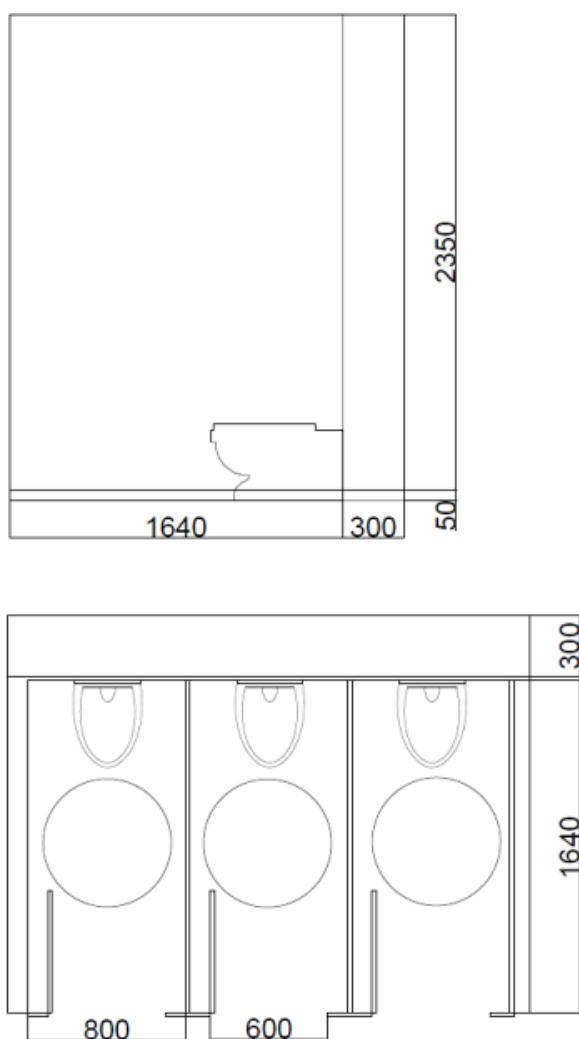


Figure 1 – Example of dimensional size of cubicles

- 6.5 Cubicle locks should be slide bolt, and operable with a closed fist.
- 6.6 All cubicle locks should have a clear indicator bolt, using different colours.
- 6.7 Heavy duty hinges should be bolted to the cubicle and door.
- 6.8 Splashbacks should be installed above all vanity units and behind hand driers. All splashbacks behind hand driers should extend from the top of the skirting / flooring upstand to the top of the hand drier, to give adequate protection to the fabric finishes in the area. (Please refer to No 5 in Appendix A - Photo Examples.)
- 6.9 Depending on the configuration of the sinks, either a single mirror or multiple mirrors should be installed above the vanity unit.
- 6.10 Mirrors should be screw fixed to the wall with specialist mirror fixings.
- 6.11 Mirrors to be frameless laminated safety mirror glass.
- 6.12 Plasterboard in washrooms to be resistant to moisture, e.g. Gyproc Moisture Resistant or equivalent.
- 6.13 Paint in washrooms to be of a high quality, Dulux, Johnstones or equivalent, with adequate preparation made to suit the condition of the substrate.
- 6.14 In general, flooring to be sheet vinyl with cove formed skirting with capping. Joints should be welded.
- 6.15 In listed or historic buildings discussion should be held with the CSU Building Surveying team, as there may be an existing floor covering which should be used from a conservation perspective.
- 6.16 All flooring within washrooms must have a minimum PTV of 36. PTV test results for flooring to be shown both under factory conditions and also once the flooring is in situ, following completion of the project.
- 6.17 Fabric shower curtains should not be used due to lack of durability and ongoing cleanliness issues.
- 6.18 Shower doors and cubicles should be constructed from materials which are easy to clean and do not leave run marks.

7 Miscellaneous

- 7.1 Soap dispensers to be installed above sinks / vanity tops only, and not in a position where they could dispense onto the floor, creating a slip hazard and risking damage to the floor covering.
- 7.2 Toilet brushes to be provided in each cubicle.
- 7.3 Coat hooks to be installed on the back of each cubicle door. Coat hooks should not have sharp edges and should be of a contrasting colour to the cubicle door.
- 7.4 Toilet paper dispensers should be positioned so that they are within easy reach of the WC. Any proposed toilet paper dispenser should be approved by House Services to ensure that it is compatible with the UOM consumables procurement.
- 7.5 At least one stainless steel general waste bin should be provided in each washroom.
- 7.6 Shelving or shower caddies should be included in any shower design to give storage space for shampoos etc. within the shower cubicle. This prevents bottles being left on the shower tray itself which can increase the slip risk.
- 7.7 The provision of lockers for secure storage, and a drying area for towels etc, should be included with all shower designs.

8 Legislative compliance

The below requirements shall be implemented in conjunction with all other applicable University policies and procedures including EPM PM07 and EPM PM14.

8.1 WC Pan	<p>WC Pan to comply with BS EN 997.</p> <ul style="list-style-type: none"> The connecting dimensions of inlets of WC pans with independent water supply shall comply with the dimensions given in BS EN 33:2011. The connecting dimensions of WC pans outlets shall comply with the dimensions given in BS EN 33:2011. The fixing dimensions for wall-hung WC pans and WC suites shall comply with the dimensions given in BS EN 33:2011.
8.2 WC Cistern	WC Cistern to comply with BS EN 14055:2018
8.3 Flush Handle	Must be capable of being operated with a closed fist; provisions are laid out in Part M.
8.4 Toilet Seat	If the WC pan manufacturer does not provide a WC seat with the WC pan or does not recommend a suitable WC seat model, the fixing dimensions for the WC seat shall comply with the dimensions given in BS EN 33:2011
8.5 Urinal	Wall-hung urinals shall function with flushing device(s) supplying flushing volumes and/or flow rates as specified by the manufacturer in accordance with BS EN 13407:2015.
8.6 Ambulant Toilet	<p>Ambulant toilet to comply with Part M.</p> <p>Grab rails to meet BS8300 and Part M.</p>
8.7 Accessible Toilet	Provisions laid out in Part M and grab rails to meet BS8300 and Part M.
8.8 Basin - Vanity Unit	BS EN 14688:2015+A1:2018 - specifies the functional characteristics and test methods for wash basins for domestic purposes.
8.9 Basin - Wall Mounted	BS EN 14688:2015+A1:2018
8.10 Taps	<p>Taps to comply with provisions within Part M.</p> <p>BS EN 816:2017 applies to single and mixer taps with automatic shut-off for use with sanitary appliances installed within washrooms</p>
8.11 Ironmongery (Door Slide Bolt)	Door handles and other ironmongery to comply with provisions laid out in Part M

9 Appendix A - Photo Examples

1. Toilet flush



Good practice - Larger flush buttons are more easily operated by people with limited physical dexterity.



Not good practice - Smaller flush button is more challenging to operate.

2. Urinal waste



Not good practice - To access the concealed urinal waste pipes the top two panels must be removed. Considering that urinal waste blocks on a relatively frequent basis this is not ideal from a maintenance perspective.

3. IPS panels

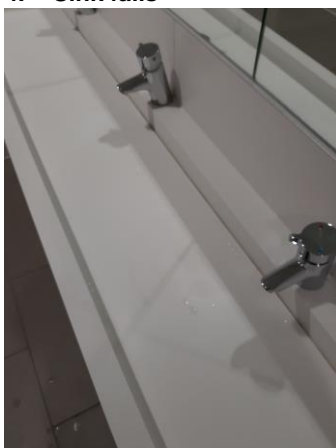


Not good practice - Large panels on clips are difficult to remove, presenting a manual handling issue. Also plastic clips can fail over time, giving a risk of the panel falling off.



Good practice - Hinged IPS panels are much more accessible for ongoing maintenance.

4. Sink falls



Not good practice - Trough style flat base sinks can leave water marks and staining which is unsightly and requires more frequent cleaning.

5. Splashbacks



Not good practice - If splashbacks are not installed behind hand driers then run mark staining becomes evident over time.

10 Appendix B - Design Checklist for University of Manchester WC refurb / Install Works

This checklist **must** be completed **in full** by the design team for all University of Manchester WC refurb / install works.

When completed it should be submitted by the Project Manager as part of the Stage Sign Off documentation.

1.	Please detail the manufacturer information for WC cubicles, to include materials specification, dimensions, and details of cubicle locks and hinges.	
2.	Please detail the manufacturer information for vanity units, to include materials specification.	
3.	Please detail the manufacturer information for sanitary ware to include specifications for WCs, flush mechanisms, sinks and taps.	
4.	Please provide details of how the washroom services will be accessed for maintenance, to include the urinal waste and WC pipework.	
5.	Please detail the plaster specification.	
6.	Please detail the paint specification.	
7.	Please detail the flooring specification.	
8.	Please demonstrate that the provision of all gender WCs has been considered.	
9.	Please demonstrate that the provisions of shower facilities have been considered.	
10.	Please provide details of the toilet roll dispensers for approval by House Services.	