NHS National Services Scotland

Scottish Health Technical Memorandum 63

SHTM Building Component Series

Fitted storage system

Health Facilities Scotland
Property and Capital Planning

December 2006

Contents

1. Introduction

Background

1.1 This is one of a series of Scottish Health Technical Memoranda which provides specifications and design guidance on building components for health buildings.

A Reference Section is provided at the end of this document, including Acts, Regulations and British Standards.

1.2 The numbers and titles of the SHTMs in the series are:

- 54 User manual;
- 55 Windows;
- 56 Partitions;
- 57 Internal glazing;
- 58 Internal doorsets;
- 59 Ironmongery;
- 60 Ceilings;
- 62 Demountable storage system;
- 63 Fitted storage system;
- 64 Sanitary assemblies;
- 66 Cubicle curtain track;
- 67 Laboratory fitting out systems;
- 69 Protection.

1.3 As stated in the Introduction to SHTM 62, the development of a demountable storage system (as described in that SHTM) does not preclude the need for, or suitability of, a fitted storage system in situations in which user requirements can be predicted with reasonable accuracy, are simple, and are likely to remain relatively unchanged.

Scope and status

1.4 This SHTM offers guidance on the technical design and output specifications of a fitted storage system suitable for use in health buildings. It is intended as general guidance only to building design teams responsible for the specification,

project design and performance requirements, and to manufacturers in the development of products to meet those requirements.

1.5 This SHTM is based on HTM 63 as published by the Department of Health. In Scotland, it has been common practice over the past few years to specify floor mounted storage components with plinths. This is acknowledged within this document, though cantilevered units are still preferred.

1.6 The content of this SHTM does not diminish either the manufacturer's responsibility for fitness for purpose of products or the design team's responsibility for selection and application of products to meet project requirements. Design teams are also reminded of their obligations under the Construction, Design and Management (CDM) Regulations 1994 (as amended 2000) to ensure safe construction.

Relationship to other data

1.7 The main sources of data used in the preparation of this SHTM are listed in the References section.

1.8 The SHTM is intended to be read in conjunction with SHTM 56 – 'Partitions' and SHTM 64 – 'Sanitary assemblies'.

1.9 This SHTM was prepared for publication in December 2006. After this date, readers should ensure that they use the latest or new edition of all building legislation, British Standards etc, which may post-date the publication of this document.

1.10 First preference should be given to products and services from sources which have been registered under current BSI Quality Assurance procedures or other certification schemes. Suppliers offering products other than to British Standards should provide evidence to show that their products are at least equal to such Standards.

1.11 This guidance should be used in conjunction with sections of the National Building Specification (NBS) relevant to fitted storage. NBS is a library of standard specification clauses covering most kinds of building work and comprising a wide range of clauses with accompanying guidance notes. All clauses are optional, and their combination into a job specification is left to the specifier. NBS has great flexibility, and it can be adapted to suit the technical needs and preferences of different projects, organisations and specifiers. Specifications go out of date as a result of technical innovation or major review of a key BSI document.

As NBS sections become affected by such major changes, they are reissued to members of the subscription service. Users are advised to ensure that they refer to the current edition. Refer to the NBS website at http://www.thenbs.com.

1.12 Any enquiries regarding the technical content of this SHTM should be e-mailed to mailto:enquiries@hfs.scot.nhs.uk

Terminology

1.13 Corbel carcasses are carcasses fixed back to the wall and providing support for worktops.

1.14 Floor or plinth mounted carcasses are carcasses supported off the floor via legs, frames or plinth frames and provide support to worktops.

2. System description

General principles

2.1 The system is based on five zones (A to E), as shown in Figures 1 and 2 (the range of components in each zone is given in paragraph 3.1):

Figure 1 illustrates a Corbel carcass and Figure 2 illustrates a Floor or Plinth mounted carcass.

- zone a: upper storage components;
- zone b: mid-storage components;
- zone c: worktops and support systems;
- zone d: lower storage components;
- zone e: clearance under lower storage components for floor cleaning (Figure 1), Plinth/leg zone (Figure 2)

2.2 Also included in the system, but not referred to in the cross-section, are tall storage components (zones A to D).

Shelving

2.3 The open storage units shown in this SHTM should be used where vertical divisions are appropriate. Where uninterrupted shelving is required for storing lengthy Items, consideration should be given to the use of the heavy duty shelving shown in SHTM 62: 'Demountable storage system' or other proprietary adjustable shelving systems.

Staff base/reception counter

2.4 These components comprise a group of interrelated sub-components primarily intended for assembly in a variety of staff-base island layouts, but can also be used to form reception, interview and other workstations.

General

2.5 Other features of the system are:

- worktops in alternative materials to a common end profile to enable end abutment of different work surfaces;
- telescopic sliding gear on units with pull-out fronts or drawers to maximise access;
- hinged doors that open through 180° minimum.

2.6 Alternative methods of support for worktops and lower storage components are included in this SHTM.

2.7 With the Corbel carcass type lower storage units are fitted 300 mm above floor level to permit the use of floor-cleaning machines and to reduce prolonged bending down. Shelf area is not reduced by this.

2.8 With the floor/plinth mounted carcass type, lower storage units are generally fitted on 100 mm high legs or bases. See also comments relating to Hygiene and Cleaning in paragraph 3.42.

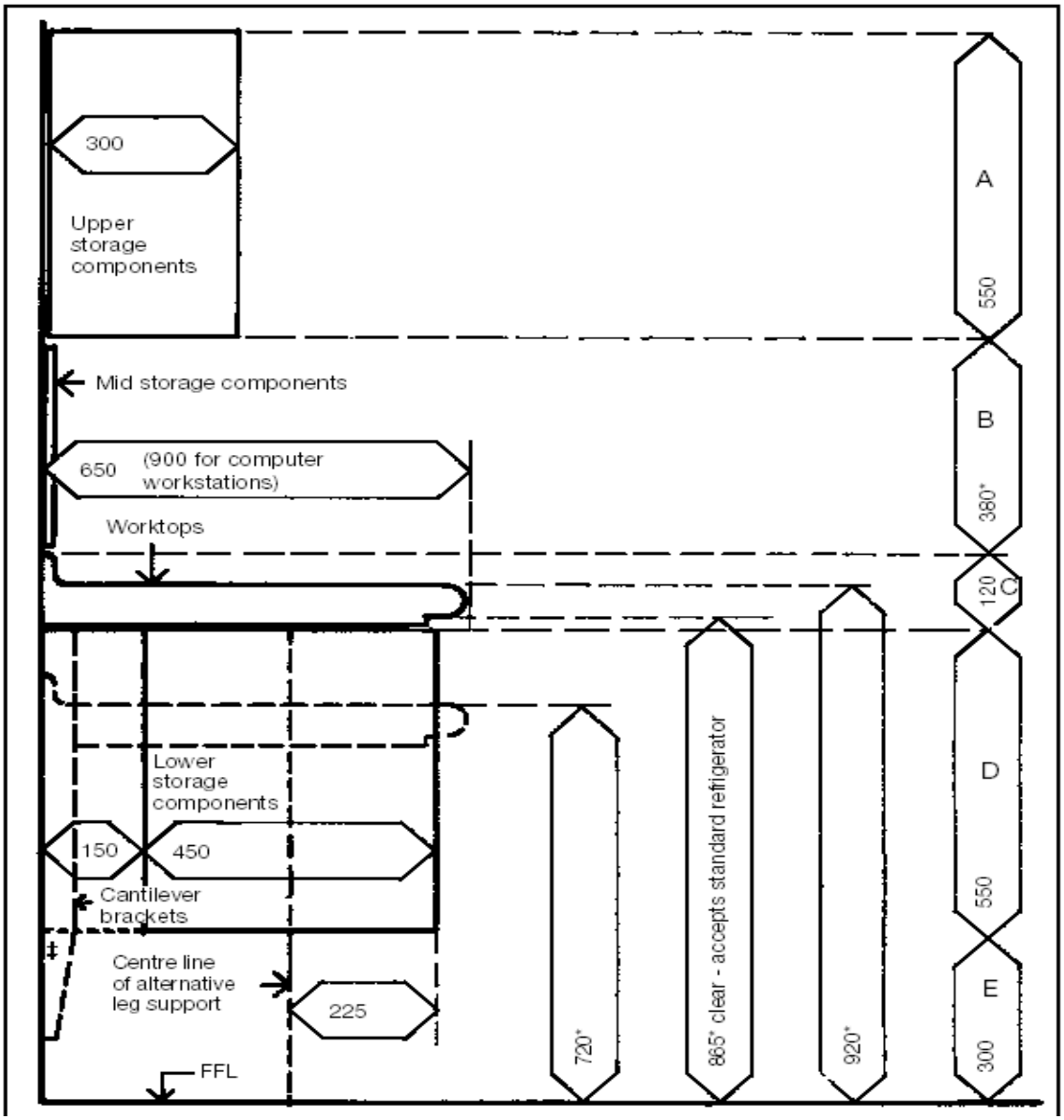


Figure 1 Main dimensions of 600 mm assemblies (assemblies also exist for 500 mm and 300 mm systems)

Upper and lower storage components are in 500, 600 and 1000mm widths and mid-storage support panels are in widths to suit project requirements.

* Dimensions with an asterisk can be modified to suit project requirements. When a worktop is at the lower level, lower storage will be limited to drawer units of not more than 350mm in height.

± Extended sides of corbel cases.

3. Component parts of the system

List of components

3.1 The following list outlines the range of components.

- Upper storage components:
  (i) open units with two fixed and one adjustable shelf and optional bridging shelves;
  (ii) cupboards with side-hung door and one adjustable shelf;
  (iii) cupboards with pair of doors and one adjustable shelf;
  (iv) ward drugs cupboard (lockable);
  (v) medicines cupboard (lockable);
  (vi) urine test cupboard (lockable);
  (vii) pack dispenser with adjustable dividers;
  (viii) pigeon holes;

- Mid-storage components:
  (i) support panels;
  (ii) handbag shelf;
  (iii) writing shelf, hinged;
  (iv) writing shelf, fixed;

- Worktops and supports:
  (i) linoleum-faced worktops;
  (ii) plastic-laminate-faced worktops;
  (iii) stainless steel worktops (plain);
  (iv) stainless steel worktops (dished);
  (v) corbel carcasses;
  (vi) cantilever brackets;
  (vii) leg supports;
  (viii) 'C' frames;

- Lower storage components:
  (i) open units with two adjustable shelves and optional bridging shelves;
  (ii) cupboards with side-hung door and one adjustable shelf;

(iii) cupboards with pair of doors and one adjustable shelf;

(iv) corner carousel;

(v) unit with drop-front hopper;

(vi) unit with pull-out front and lift-out container;

(vii) unit with pull-out front and two lift-out containers;

(viii) unit with pull-out front and central double-sided support panel for tote boxes and other hook-on containers;

(ix) unit with twin pull-out fronts and lift-out containers;

(x) single-drawer unit;

(xi) two-drawer units;

(xii) three-drawer units;

(xiii) four-drawer units;

(xiv) six-drawer units;

(xv) multi-drawer units;

(xvi) mobile units;

- Tall storage components:

  (i) open-shelf carcass with straight or sloping adjustable shelves and pack dispenser;

  (ii) open-shelf carcass with adjustable shelves;

  (iii) wardrobe;

  (iv) unit with two pull-out fronts and lift-out containers;

  (v) cupboard with adjustable shelves;

- Accessories:

  (i) filing drawer frames;

  (ii) tote boxes;

  (iii) shallow trays;

  (iv) catheter racks;

- Staff base/reception counter components for:

  (i) staff base island layouts;

  (ii) reception desks;

  (iii) interview desks;

  (iv) appointment booking desks and other workstations with similar functions.

Description of components

3.2 As the design, manufacture and supply of the component parts of the system are entirely open to competition, the illustrations of the components in this section of the document are intended to provide a general indication only of system design requirements, and the descriptions of them are confined to:

- coordinating dimensions. This relates to Corbel carcasses for base units. Adjustments to a height of 1,200mm generally applicable for floor/plinth mounted units. Refer to separate manufacturers literature for further guidance;
- intended use (if not self-evident);
- design features or aspects of specification relevant to user requirements;
- reference to aspects of specification for which the user of the system should refer to manufacturers' product specifications (see paragraph 3.4).

3.3 Dimensions are given as appropriate under the following designations:

H = the vertical height of the component (this varies depending on type of lower storage unit carcass specified – see paragraph 3.2);

W = the width of the component;

D = the depth (front to back) of the component.

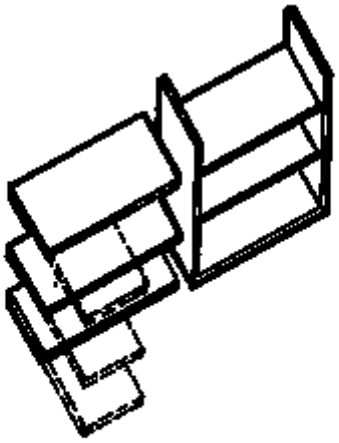
3.4 To avoid repetition, the following aspects of product specification will in all cases merit attention:

- specification of manufacturer's method of fabrication;
- performance test data;
- method of installation and builders' work required;
- provision of locks should be specified only where essential;
- specification of hinges, catches, drawer runners, handles/pulls etc;
- details of support panels, tote boxes and containers of all types generally referred to.

Upper storage components

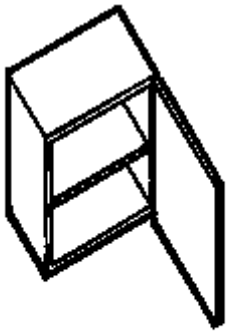
Open-shelf carcass with two fixed and one adjustable shelf

3.5 Bridging shelves, usually in sets of three, can be used to form continuous open storage. Corner shelves are available as an option.



H	W	D
550	500	300
550	600	300

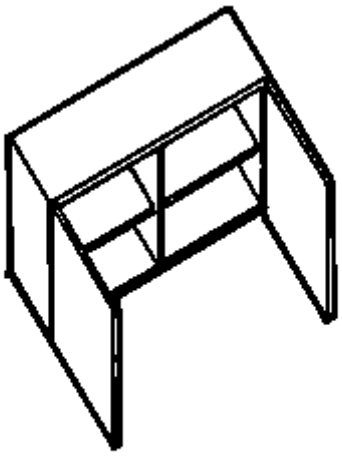
Cupboards with side-hung door and one adjustable shelf



H	W	D
550	500	300
550	500	300

Cupboards with pair of doors and one adjustable shelf

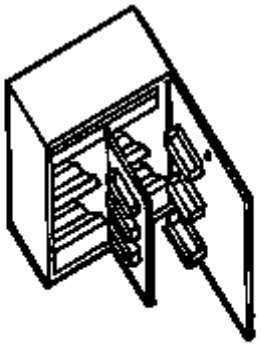
3.6 The 1000mm units have central division with one adjustable shelf on each side and with option of sliding doors.



H	W	D
550	600	300
550	1000	300

3.7 Left and right hand versions. For use in areas under 24-hour surveillance, these cupboards should be electrically connected to a remote warning light at a staff base or other control point.

3.8 See specification notes in the Appendix regarding locks and protective warning and indicator lights.

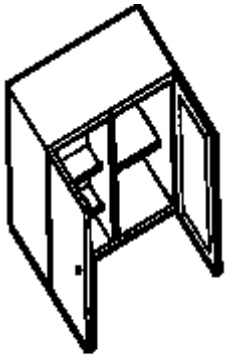


H	W	D
550	600	300
550	600	300

Ward drugs cupboards (lockable) with stepped shelves, door racks and integral warning light

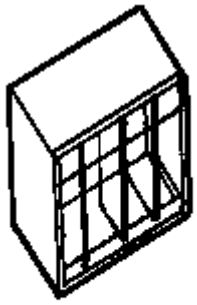
H	W	D
550	600	300

Medicines cupboard (lockable) with swing-out interior and door racks



H	W	D
550	600	300

Urine test cupboard (lockable) with central division, door racks, two narrow fixed shelves, RH compartment containing one adjustable shelf with pin-up facility on door



H	W	D
550	600	300

Pack dispenser with adjustable dividers

H	W	D
550	600	300

Pigeon-hole unit with up to nine vertical adjustable dividers

Mid-storage components

3.9 The components illustrated are intended as a general indication only of a wide range of items compatible with the system which manufacturers may offer.

Support panels (demountable)

3.10 Height dimensions are in 150mm increments to suit project requirements and can extend to the other two zones depending upon worktop height. Panels are in corrosion-resistant material. Principally used for mid- storage but may be used in carcasses to carry accessories such as tote boxes, catheter trays etc.

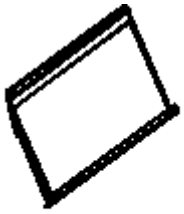
H	W	D
150	500	20
150	600	20
150	1000	20
150	1200	20
300	500	20
300	600	20
300	1000	20
300	1200	20

H	W	D
100	300	150
100	500	150

Handbag shelf (with rounded corners)

H	W	D
150	600	400

Writing shelf, hinged



H	W	D
200	600	400

Writing shelf, fixed and sloping

Writing shelf, fixed and sloping

3.11 Materials listed below are preferred solutions. Other suitable materials may be used.

3.12 Worktops are linoleum or plastic laminate-faced, or are of stainless steel, all to a common profile for compatibility between abutting components of different materials. See paragraphs 3.35–3.42 for a recommended worktop profile and definition of height and depth dimensions referred to in the diagrams. Width dimensions are subject to project requirements, but are normally in 100mm increments. Refer to manufacturers' product data for details of exposed ends, ends for abutment and end upstands. Worktops should be solid end capped.

3.13 Stainless steel worktops, with or without sinks or hoppers, shall be fitted with an earthing terminal. Refer to SHTM 64: 'Sanitary assemblies' and manufacturers' product specifications for size and location of sink bowls, details of taps, traps etc.

Linoleum-faced worktops

3.14 Intended for use where activities call for a softer desk-like surface.

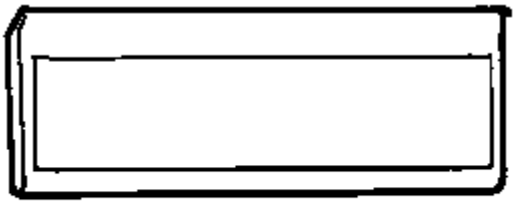
H	W	D
120	*	350
120	*	550
120	*	650

Plastic-laminate-faced worktops

3.15 Intended for use in areas such as medical/nursing or pharmacy manufacturing. Inset sinks (or sink units with drainers) may be pressure-bonded into laminate worktops to suit project requirements (see diagram in paragraph 3.14 for dimensions).

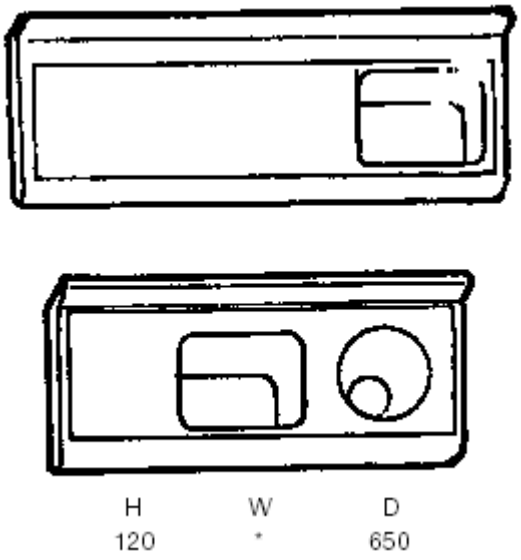
Stainless steel worktops (plain)

3.16 Intended for use as heavy duty work-surfaces for dry (or relatively dry) activities (see diagram in paragraph 3.14 for dimensions with the exception that 350mm depth is not available for these worktops).



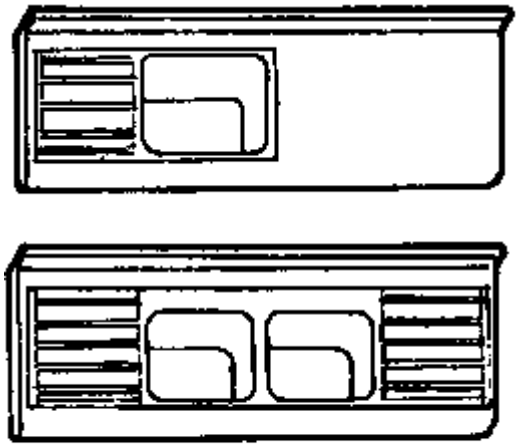
H	W	D
120	*	550

Stainless steel worktops (dished)



H	W	D
120	*	650

Stainless steel worktops (dished) which may have sink bowls, plaster sinks or hoppers in any position



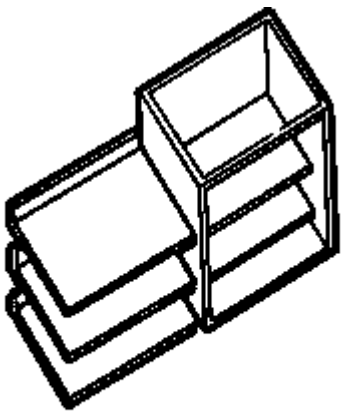
H	W	D
120	*	550
120	*	650

Stainless steel worktops (plain) with sink bowls and drainers in any position

Lower storage components

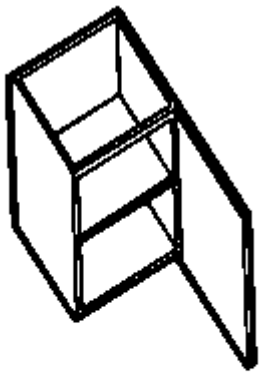
3.17 Refer to manufacturers' data for details of fixings to underside of worktops.

3.18 Most of the lower storage components may be fitted with castors and tops and used as mobile under bench storage.



H	W	D
550	500	450
550	600	450

Open-shelf carcass with two adjustable shelves and optional bridging shelves

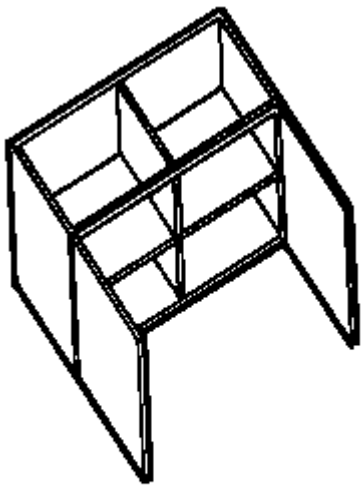


H	W	D
550	500	300
550	500	300
550	500	450
550	500	450

Cupboards with side-hung door and one adjustable shelf

Cupboards with pair of doors and one adjustable shelf

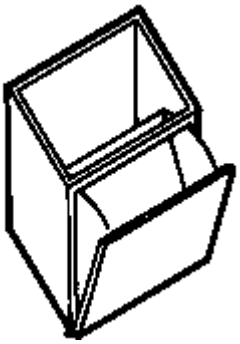
3.19 The 1000mm units have a central division with one adjustable shelf on each side and option of sliding doors.



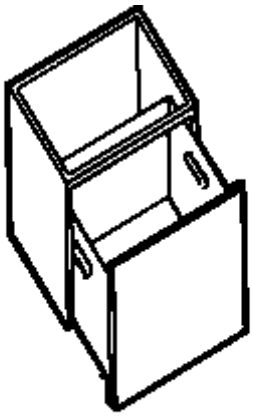
H	W	D
550	600	300
550	1000	300
550	600	450
550	1000	450

H	W	D
550	900	900

Corner carousel

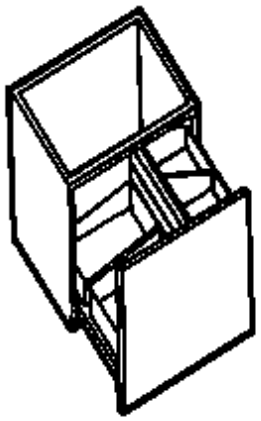


Unit with drop-front hopper



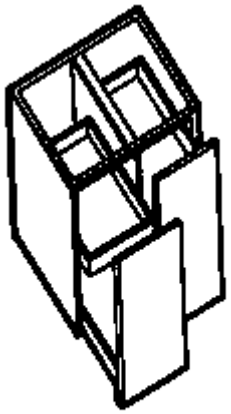
H	W	D
550	500	450
550	600	450

Unit with pull-out front and lift-out container



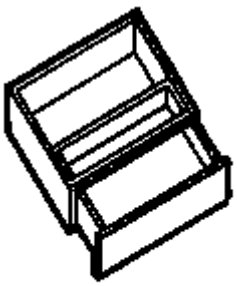
H	W	D
550	500	450
550	600	450

Unit with pull-out front and central double-sided support panel for tote boxes and other hook-on containers



H	W	D
550	500	450
550	600	450

Unit with twin pull-out fronts and optional lift-out containers

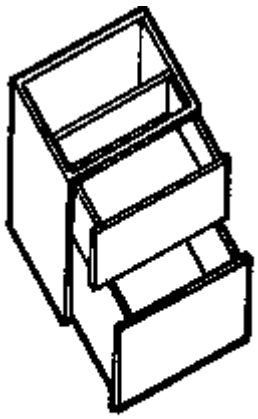


H	W	D
150	500	450
150	600	450

Single-drawer unit

Two-drawer units (a)

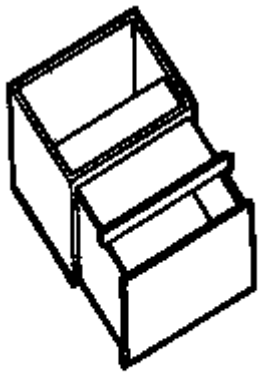
3.20 These units comprise one 250mm and one 300mm high drawer.



H	W	D
550	500	450
550	600	450

Two-drawer units (b)

3.21 The 150mm units comprise one 50mm shallow drawer and one 100mm drawer. The 350mm units (as shown) comprise one 50mm shallow drawer and one 300mm high drawer.

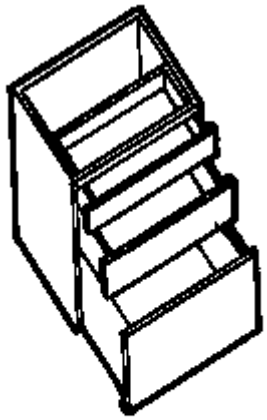


H	W	D
150	500	450
150	600	450
350	500	450
350	600	450

Three-drawer units

3.22 The 350mm units (as shown) comprise two 100mm drawers and one 150mm drawer.

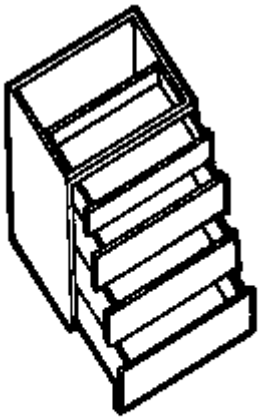
3.23 The 550mm units comprise 100mm, 150mm drawers and one 300mm drawer, which may be fitted with a filing frame.



H	W	D
350	500	450
350	600	450
550	500	450
550	600	450

Four-drawer units

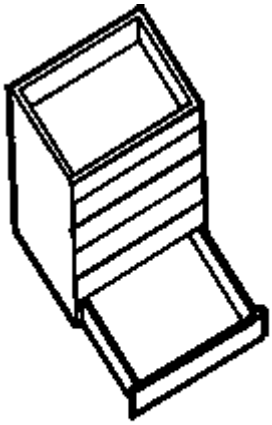
3.24 The 350mm units (as shown) comprise one 50mm shallow drawer and three 100mm drawers. The 550mm units comprise one 100mm drawer and three 150mm drawers.



H	W	D
350	500	450
350	600	450
550	500	450
550	600	450

Six-drawer units

3.25 Refer to manufacturers' product specifications for other possible combinations of 150mm, 350mm or 550mm carcass heights with 50mm, 100mm, 150mm or 300mm high drawers. Any 300mm high drawers may be fitted with a filing frame.



H	W	D
550	500	450
550	600	450

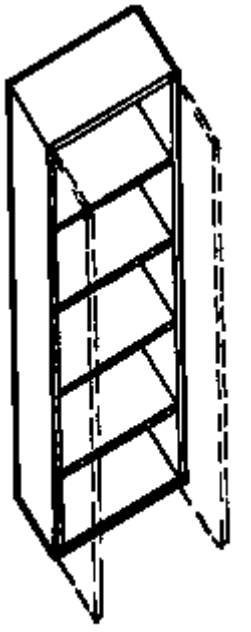
Multi-drawer units

3.26 Shallow drawers to project requirements.

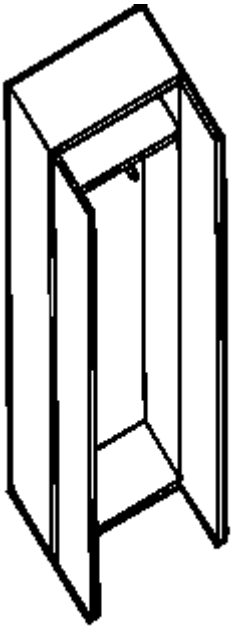
Tall storage components

Open-shelf unit with adjustable shelves

3.27 When used with bridging shelves can provide whole wall divided storage.



H	W	D
1600	600	300

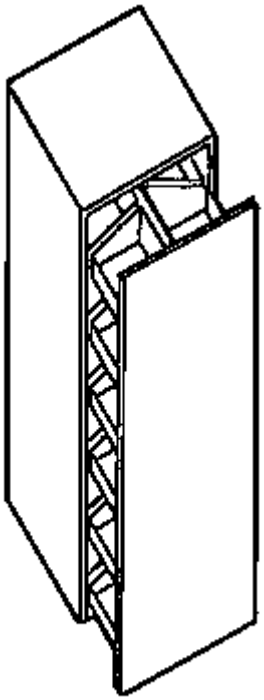


H	W	D
1600	600	300

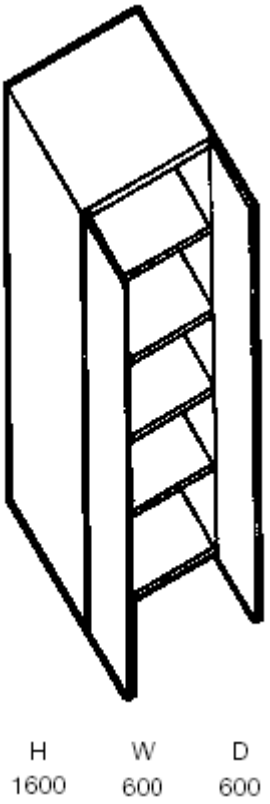
Wardrobe with shelf and hanging rail

Unit with pull-out front and lift-out containers or shelves

3.28 Refer to manufacturers' product data and design details for specification of sliding gear for pull-out fronts, and lift-out and hook-on tote boxes.



H	W	D
1600	600	600



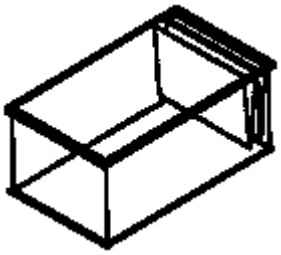
Cupboard with adjustable shelves

Accessories

3.29 Specify with appropriate storage unit.

Filing drawer frames

3.30 Dimensions to suit 300mm filing drawer in both 500mm and 600mm width drawer units.



Tote boxes

3.31 Available in various sizes. Dimensions and profile to suit support panels.

Shallow trays

3.32 For use in both 500mm and 600mm width units.

Catheter trays

3.33 Available in a variety of lengths and profiles to hook onto support panels.

Profile of worktops

Vertical loading of worktops

3.34 All worktops with corbel carcasses, legs or brackets should comply with the requirements of BS 4875-7.

Deflection

3.35 Spans of worktops exceeding 1800mm may cause excessive deflection (see BS 4875-5).

Corbel carcasses

3.36 Carcass units fixed back to partitions/walls may be used to support worktops with side cheeks extended by 50 mm or 150 mm as appropriate. Knock-out panels may be incorporated to accommodate service runs.

Cantilever brackets

3.37 Cantilever brackets may be used to support the 600 mm (see Figure 1) and 500 mm assemblies and the standing and sitting work-surface heights in each case.

3.38 Refer to manufacturers' product specifications for details of the design and specification of these brackets and requirements for fixing them to walls and partitions. Particular attention should be paid to the performance test and criteria referred to in Chapter 4 to ensure that brackets and fixings offered by a manufacturer comply.

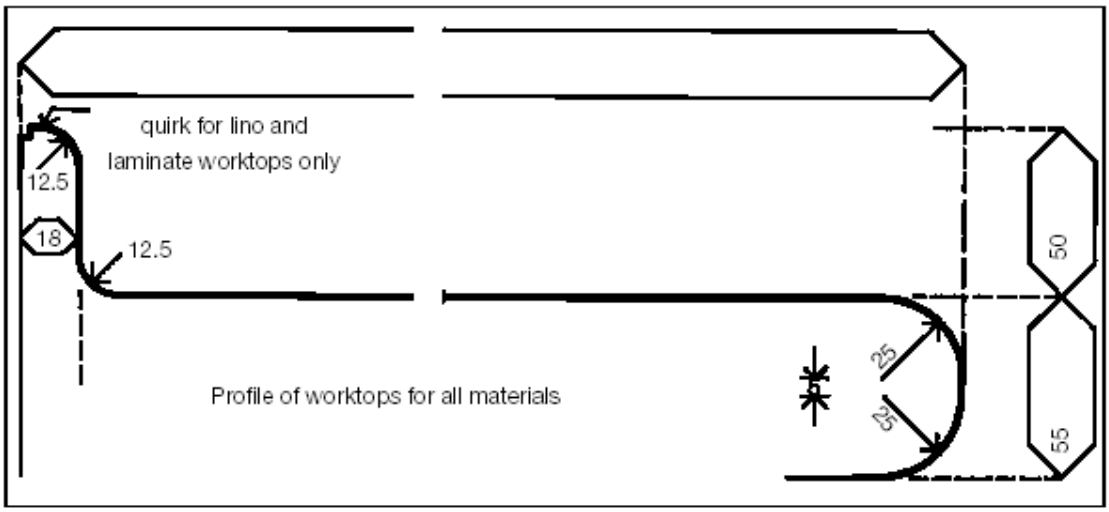


Figure 2: Profile of worktops

Leg supports

3.39 Where it is necessary to use leg supports, they should be in the following nominal heights with facility for vertical adjustment and for the incorporation of a floor-anchoring device:

- to the underside of 920mm worktops;
- to the underside of 720mm worktops;
- to the underside of lower storage components.

'C' frames

3.40 'C' frames may be used to support the 600mm and 500mm assemblies at standing and sitting work- surface heights in each case. The frames may be secured back to walls or may be free-standing.

3.41 Refer to manufacturers' product specifications for details of design and specification for leg frames and 'C' frames, with particular attention to ease of cleaning at junctions with flooring.

Hygiene and cleaning

3.42 Control and Prevention of Healthcare Associated Infection (HAI) is a priority issue for NHSScotland – both in respect of the safety and well being of patients and staff and also the resources consumed by potentially unavoidable infections.

Healthcare Associated Infection (HAI) is a complex issue involving the many different elements of patient care and provision. Due to its multi-factorial nature there is a need to develop a holistic approach to combating the spread of infection within the built environment.

It is imperative that those involved in the design and planning, construction and refurbishment and on-going maintenance of the healthcare facility have a sound knowledge of prevention and control of infection in the built environment.

SHFN 30 and HAI-SCRIBE aim to provide information on the prevention and control of infection, and on the prevention of cross-infection and cross contamination in healthcare facilities, to those responsible for the planning, design and maintenance of such facilities.

Cleaning is an essential part of the multi-disciplinary approach in improving patient, staff and public safety. Safe clinical care is supported through ensuring high standards of hygiene and related measures to tackle HAI in the healthcare environment.

Cleaning regimes including frequency of cleaning should be addressed in line with current national guidance together with any additional Local Management requirements.

Relevant Provisions of current guidance, standards and Codes of Practice for cleaning of healthcare premises and including the latest technical requirements are embodied in the following documents:

- SHFN 30: Infection Control in the built environment: Design and Planning
- HAI-Scribe (Healthcare Associated Infection System for Controlling Risk in the Built Environment).
- The NHSScotland National Cleaning Services Specification
- NHS Quality Improvement, Scotland – Healthcare Associated Infection (HAI) Cleaning Services Standards
- The NHSScotland Code of Practice for the Local Management of Hygiene and Healthcare Associated Infection
- Clinical Standards Board for Scotland Healthcare Associated Infection (HAI) Infection Control Standards

4. Performance

Strength

4.1 Storage components in this SHTM should comply in general with the requirements of BS 4875 Parts 5, 7 and 8.

4.2 Various performance tests to which components should comply are set out in these Standards, and specifiers are advised to seek certification or other evidence of compliance with these tests.

4.3 The decision as to whether to use corbel carcasses, cantilever brackets or leg supports for the whole or part of the installation should be determined after consideration of the load-bearing capacity of the assembly and its fixings and the construction of the wall or partition to which the units are to be fixed.

4.4 Safe working loads should be determined for the corbel carcasses or cantilever brackets mounted on the appropriate partition and, where these are unlikely to meet the loading requirements of the installation, alternative support systems should be used.

4.5 In new hollow plasterboard partitions, timber or metal frame members fitted within the cavity will provide safe working-load capacity. See SHTM 56: 'Partitions' for details of standards relating to strength and stability.

4.6 Installations to be mounted on existing hollow plasterboard partitions without timber dwangs may only be suitable for leg supports or 'C' frames.

4.7 Safe working loads for installations mounted on masonry walls and partitions will depend upon the type and condition of the masonry, the condition and thickness of plaster or other facing materials, and the fixing device used.

4.8 Users should make a careful assessment of local conditions and carry out loading tests to determine safe working loads for installations.

4.9 Refer to manufacturers' product data for details of cantilever brackets and the loads that they can sustain. Users are advised to seek test certification from manufacturers as to safe working loads achieved by their products under test conditions, recommended methods of fixing to walls and partitions and type of fixing devices used under test.

Surface finishes

4.10 Surface finishes of components fabricated from wood or wood-based materials should be tested using the methods described in the following Standards:

- BS EN 12720:1997 ‘Furniture. Assessment of surface resistance to cold liquids’;
- BS EN 12721:1997 ‘Furniture. Assessment of surface resistance to wet heat’;
- BS EN 12722:1997 ‘Furniture. Assessment of surface resistance to dry liquids’;
- BS 3962-5:1980 ‘Methods of test for finishes for wooden furniture. Assessment of surface resistance to cold oils and fats’;
- BS 3962-6:1980 ‘Methods of test for finishes for wooden furniture. Assessment of resistance to mechanical damage’.

4.11 Finished surfaces should be smooth and free from application marks.

4.12 Plastic laminates should be specified in accordance with BS EN 438-1:1991 and tested in accordance with BS EN 438-2:1991.

4.13 Linoleum for worktops should be to BS EN 12104:2000 without additional finish.

4.14 All mild steel components must be treated to be corrosion-resistant.

Surface spread of flame

4.15 When tested in accordance with BS 476 Part 7, painted and lacquered surfaces should achieve a minimum of Class 4, and melamine-veneered surfaces Class 3.

Ironmongery and fittings

4.16 The performance of individual fittings should comply with relevant British Standards (see Appendix).

4.17 Hinges should permit doors to open through 270º.

4.18 All fittings should be corrosion-resistant.

5. Design application

Coordination with building and engineering design

5.1 It will be vitally important to ensure that walls and partitions are capable of taking the cantilevered loads imposed by the system and allow for the appropriate fixing of the corbel carcasses, cantilever brackets and bearers. Depending upon the specification and design of brackets offered by manufacturers, it may be necessary to specify timber dwangs or metal plates in hollow plasterboard partitions to prevent deflection of the plasterboard (see paragraphs 4.1– 4.9)

5.2 The majority of engineering service terminals will fall conveniently within the mid-storage zone. Others such as cleaners' sockets and plug-in connections to refrigerators in the lower storage zone can be located above skirting level in the floor clearance zone between cantilever brackets.

Appendix: Supplementary specification and design data

Materials and finishes for components

Materials/finishes listed below are preferred solutions. Other suitable finishes, such as plastic laminate or veneer, may be used where appropriate.

Cupboards and drawer carcasses:

- medium density fibreboard (MDF) with pigmented acid-catalyst finish to all exposed surfaces inside and outside.

Side-hung doors/drawer fronts:

- MDF with pigmented acid-catalyst finish to all exposed surfaces inside and outside.

Drawer bottoms and cupboard backs:

- duo-faced hardboard/MDF.

Worktops:

- stainless steel;
- high density chipboard with post-forming grade laminate finish;
- high density chipboard with linoleum finish.

Specification references for materials and finishes

- BS 1186-2:1988 ‘Timber for and workmanship in joinery. Specification for workmanship’.
- BS 1186-3:1990 ‘Timber for and workmanship in joinery. Specification for wood trim and its fixings’.
- BS EN 120:1992 ‘Wood-based panels. Determination of formaldehyde content. Extraction method called the perforator method’.
- BS EN 310:1993 ‘Wood-based panels. Determination of modulus of elasticity in bending and of bending strength’.
- BS EN 312:2003 ‘Particleboards. Specifications’.

- BS EN 316:1999 ‘Wood fibreboards. Definition, classification and symbols’. BS EN 317:1993 ‘Particleboards and fibreboards. Determination of swelling in thickness after immersion in water’.
- BS EN 318:2002 ‘Wood-based panels. Determination of dimensional changes associated with changes in relative humidity’.
- BS EN 319:1993 ‘Particleboards and fibreboards. Determination of tensile strength perpendicular to the plane of the board’.
- BS EN 320:1993 ‘Fibreboards. Determination of resistance to axial withdrawal of screws’.
- BS EN 321:1993 ‘Fibreboards. Cyclic tests in humid conditions’.
- BS EN 322:1993 ‘Wood-based panels. Determination of moisture content’.
- BS EN 323:1993 ‘Wood-based panels. Determination of density’.
- BS EN 324-1:1993 ‘Wood-based panels. Determination of dimensions of boards. Determination of thickness, width and length’.
- BS EN 324-2:1993 ‘Wood-based panels. Determination of dimensions of boards. Determination of squareness and edge straightness’.
- BS EN 325:1993 ‘Wood-based panels. Determination of dimensions of test pieces’.
- BS EN 382-1:1993 ‘Fibreboards. Determination of surface absorption. Test method for dry process fibreboards’.
- BS EN 438-1:1991 ‘Decorative high-pressure laminates (HPL) sheets based on thermosetting resins. Specifications’.
- BS EN 438-2:1991 ‘Decorative high-pressure laminates (HPL) sheets based on thermosetting resins. Determination of properties’.
- BS EN 622-1:1997 ‘Fibreboards. Specifications. General requirements’.
- BS EN 622-2:1997 ‘Fibreboards. Specifications. Requirements for hardboards’.
- BS EN 622-3:1997 ‘Fibreboards. Specifications. Requirements for medium boards’.
- BS EN 622-4:1997 ‘Fibreboards. Specifications. Requirements for softboards’.
- BS EN 622-5:1997 ‘Fibreboards. Specifications. Requirements for dry process boards (MDF)’.
- BS EN 942:1996 ‘Timber in joinery. General classification of timber quality’.
- BS EN 10029:1991 ‘Specification for tolerances on dimensions, shape and mass for hot rolled steel plates 3 mm thick or above’.
- BS EN 10048:1997’ Hot rolled narrow steel strip. Tolerances on dimensions and shape’.

- BS EN 10051:1992 'Specification for continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels. Tolerances on dimensions and shape'.
- BS EN 10095:1999 'Heat resisting steels and nickel alloys'.
- BS EN 10209:1996 'Cold rolled low carbon steel flat products for vitreous enamelling. Technical delivery conditions'.
- BS EN 10258:1997 'Cold-rolled stainless steel narrow strip and cut lengths. Tolerances on dimensions and shape'.
- BS EN 10259:1997 'Cold-rolled stainless and heat resisting steel wide strip and plate/sheet. Tolerances on dimensions and shape'.
- BS EN 12104:2000 'Sheet linoleum, cork carpet and linoleum tiles'.

General notes

Experience has shown that melamine coatings and plastic foil edgings to chipboard are not suitable for use in health buildings.

Mild steel for carcasses, shelves etc should be avoided because of the danger of corrosion. Mild steel hinges and fixings may be acceptable if suitably rust-proofed.

The final choice of materials and finishes must be the responsibility of the specifier based on test-proven performance, availability and cost.

Laminate-only end facings to worktops are not suitable for health buildings.

Ward drugs cupboard

The ward drugs cupboard described below is currently in use in the NHS and should comply with security level 1 as set out in BS 2881.

The cupboard should be fitted with a removable electrical shelf containing light(s) to illuminate the interior of the cupboard, an indicator light visible from the front when the door is closed, and an electrical connection box. When installing or removing the cupboard, this shelf should be removed to allow access to the electrical connection.

Below the electrical shelf, the cupboard is divided into two compartments. One lower compartment is fitted with a second door hinged on the central divider and of the same hand as the outer door.

Each door should be fitted with a lock, the keys to which must differ so that the key which operates the outer door will not operate the inner door.

Locks should be in accordance with BS 2881 and when tested in accordance with BS 3621. Escutcheon plates will be required to locks on doors with a lacquer finish.

Electrical performance

The cupboard should be wired in accordance with the BS 7671. All electrical fittings should comply with the appropriate BS specifications.

Fixing instructions

The electrical feed should emerge from the wall in the centre of the proposed position of the cupboard and be at 1700mm above floor level.

The cupboard should be fixed as follows:

- remove the electrical shelf to reveal the cable entry hole in the back of the carcass;
- drill four pilot holes through the back to mark the wall;
- remove the cupboard and drill and plug the wall four times with suitable plugs;
- remount the cupboard, thread the wires through and screw the cupboard to the wall with four 10-gauge woodscrews or similar-sized fixings;
- connect the wires to the terminals in the connector box in the electrical shelf and replace the shelf.

Specification of electrical services to ward drugs cupboard

Regulations

All materials and components of the ward drugs cupboard should comply with the latest requirements of the Regulations for the Electrical Equipment of Buildings as issued by the Institute of Engineering and Technology, British Standards specifications (to include all relevant amendments) and the relevant parts of 'Electrical Safety Code for Hospital Laboratory Equipment', insofar as the correct operation is not at variance with any of these requirements.

Operation

Electrical services to the ward drugs cupboard should provide the following facilities:

- illumination of shelf areas automatically when the door is opened;
- indication on the cupboard (and remotely) that the cupboard is open;
- continuous power supply indication on the cupboard to show that the circuit is functioning.

The internal illumination and 'cupboard open' indication should be a function of one lamp, controlled by a door operated switch. The lamp-holder should be mounted within the front edge of the hollow shelf enclosed by an opal plastic

cover (allowing illumination to the upper and lower sections of the cupboard) behind a translucent red dome-lens mounted in the cupboard door.

The power supply indicator lamp should be fitted within the front edge of the shelf behind a translucent green dome-lens in the cupboard door.

Wiring

Wiring shall be 0.75mm2 PVC-insulated, flexible cables complying with BS 6500, concealed within the hollow shelf. At the position where connections are to be made to the building and remote indication wiring, a hole large enough to prevent chafing of cables is to be provided in the rear of the shelf.

Cabling at the back of the cupboard should consist of two 400mm lengths of 0.75mm2 PVC-insulated, PVC- sheathed flexible cables to be connected to the wiring of the building. One of these cables should provide the incoming service to the cupboard and the other for connection to a remote indicator. Both should be fully identified and connected to the relevant terminals of the terminal block.

Terminal block

A suitable terminal block containing four terminals should be provided within the hollow shelf to terminate all connections. The terminals shall be of the pinch screw type and of adequate capacity to securely connect all the strands of all conductors. Each terminal should be identified as to its use.

Door switch

One micro-switch activated by the opening of the outer door should be fitted in the front edge of the hollow shelf. The switch should operate the interior/indicator lamp within the cupboard. The spring operation of the switch should be of sufficient strength to force the door to the obviously open position and operate the internal light.

Interior/indicator lamp

One Type B15 lamp-holder to BS EN 61184:1995 and a 15 W lamp having a bayonet cap complying with BS EN 60061 should be fitted within the front edge of the hollow shelf behind a translucent red dome-lens in the outer cupboard door. The lamp should be enclosed behind an opal plastic cover which should incorporate sufficient provision for the ventilation of the lamp.

'Power on' indicator lamp

One filament-type lamp shall be fitted within the front edge of the hollow shelf behind a translucent green dome-lens; the lens should be of sufficient dimensions that the indication light is visible when the outer door is closed.

Terminals

All terminals, or any other live part, are to be covered or so protected that they cannot be inadvertently touched.

Earthing

All metal parts and items of electrical equipment should be efficiently bonded to earth potential. An earth terminal should be provided as one of the four terminals on the terminal block to which the systems earth of the building shall be connected. An additional core should be included in the mains cable connection for earthing purposes.

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