
INTERNATIONAL STANDARD 3827 / 1

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Shipbuilding — Co-ordination of dimensions in ships' accommodation — Part I : Principles of dimensional co-ordination

Construction navale — Coordination dimensionnelle pour l'ameublement des navires — Partie I : Principes de la coordination dimensionnelle

First edition — 1977-02-01

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UDC 629.12 : 389.63

Ref. No. ISO 3827/1-1977 (E)

Descriptors : shipbuilding, ships, appointments, furnishing, prefabrication, dimensional co-ordination, modular structures.

FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3827/1 was developed by Technical Committee ISO/TC 8, *Shipbuilding*, and was circulated to the member bodies in June 1975.

It has been approved by the member bodies of the following countries:

Austria	Israel	South Africa, Rep. of
Belgium	Italy	Spain
Brazil	Japan	Sweden
Czechoslovakia	Netherlands	Turkey
Finland	Norway	United Kingdom
Germany	Poland	Yugoslavia
Ireland	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

France

Shipbuilding – Co-ordination of dimensions in ships' accommodation –

Part I : Principles of dimensional co-ordination

0 INTRODUCTION

The rationalization of traditional shipbuilding methods and the increasing use of prefabricated assemblies necessitates the utilization of standardized components wherever possible. In the outfitting of ships, in order to achieve the maximum benefit from the use of these components a systematic design method, applying both to the components and the space within which they are used, must be adopted which will give a common basis for layout, production and assembly.

Dimensional co-ordination is a system of applying a range of related dimensions to the sizing of components and assemblies and the structures incorporating them. This method of standardizing sizes or dimensions, which are not necessarily related to particular components, materials or manufacturing processes, permits its application to the widest possible range of components and assemblies, and will give the following advantages :

- 1) the maximum economy in the production of components by variety reduction;
- 2) the reduction in manufacture of non-standard units;
- 3) the avoidance of wastage in cutting components on site by achieving maximum flexibility in assembly;
- 4) the interchangeability of components giving more choice and flexibility for designers.

Modular co-ordination is a particular form of dimensional co-ordination in which the range of related dimensions is restricted by utilizing a standard step or module, the size of which is selected in order to satisfy the following requirements :

- a) it should be sufficiently small to give multiples which satisfy the sizes required for the various components in shipboard use and provide suitable increments to minimize alterations to existing sizes;
- b) it should be sufficiently large to achieve an effective

measure of simplification to the existing number of sizes;

- c) for ease of application, it should be expressed as a whole number bearing a simple relationship to existing systems of measurement;

- d) it should be selected to give the widest possible agreement with any national or international standards for dimensional co-ordination in shipbuilding or for related components.

The advantages of dimensional and modular co-ordination have been internationally recongized for many years and an International Standard has been agreed for the increments or modules to be used in the construction industry.

The ultimate aim in publishing recommendations for dimensional co-ordination is the establishment of standardized ranges of sizes for components, and in order to achieve the maximum utilization of these components it is necessary to establish a comprehensive system which will form a framework for sizing, positioning and assembling co-ordinated components.

In shipbuilding the main advantages in utilizing co-ordinated components occur in the accommodation areas where repetitive components are used which are common to the other industries operating dimensional co-ordination.

1 SCOPE AND FIELD OF APPLICATION

This International Standard sets out the basic principles of dimensional co-ordination, with particular reference to the co-ordination of dimensions in ships' accommodation.

2 DEFINITIONS

For the purpose of this International Standard the definitions given in ISO 3827/II are applicable.

3 THE BASIS OF DIMENSIONAL CO-ORDINATION

TABLE 1 – Standard modules

Preference	1st	2nd	3rd
	300	100	50

TABLE 2 – Co-ordinating sizes

Preference	1st	2nd	3rd
300			50
			100
			200
			250
			350
			400
			500
	600		
			550

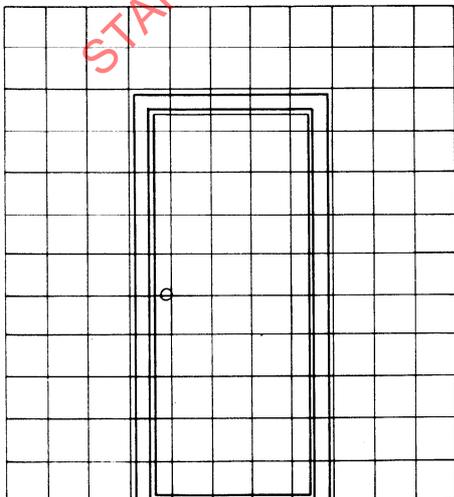
3.1 Dimensional framework

In order to ensure that dimensionally co-ordinated components or assemblies of components fit the spaces allocated to them a dimensional framework, or reference system, is employed which is common to both.

3.1.1 Modular grids

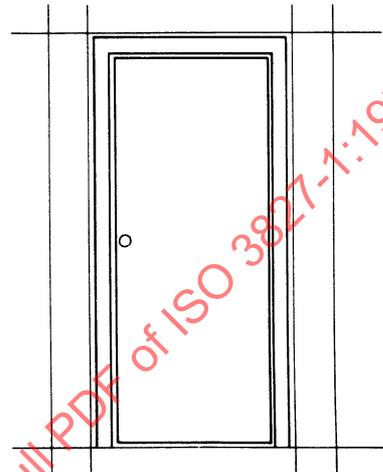
The dimensional framework is represented by a grid, in which the grid lines are spaced in multiples of the standard modules, or increments of size, and the grid lines indicate the boundaries for the component and the space allocated to it.

The use of a grid on drawings is an aid in locating components and in reading the drawings; as such it is a tool for communication.

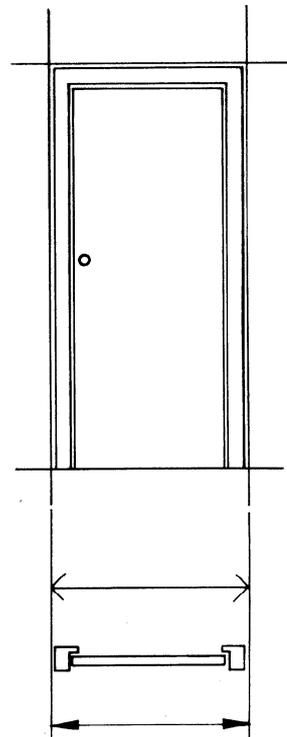


3.2 Modular components

The size of components should be co-ordinated in accordance with the preferences given in tables 1 and 2. A component having a co-ordinating size derived from these preferences is a modular component.



The co-ordinating size of a component is equivalent to the size of the co-ordinating space allocated to it. Both include the work size of the component plus an allowance for its joints and tolerances.



NOTE — In the accompanying sketches certain conventions are used to identify different spaces and sizes. These conventions are :

Reference lines : Normally indicated as a continuous line.



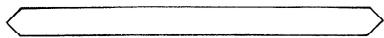
Centre and axial lines : Are normally also reference lines but are indicated as a thin chain line.



Controlling lines : Indicated by a circle at the end of a reference line.



Controlling dimensions : Represented by an enclosed arrow.



Co-ordinating space and size : Represented by an open arrow-head.



Work size : Indicated by a solid arrow-head.



4 THE CONTROLLING REFERENCE SYSTEM

In establishing a dimensional framework, or reference system, which can be related to both dimensionally coordinated components and the structure incorporating them it is essential to establish certain controls over the principal dimensions of the reference system.

The initial control is based on the use of the standard modules given in table 1 but, in order to reduce the considerable number of permutations possible with these modules, further controls are necessary.

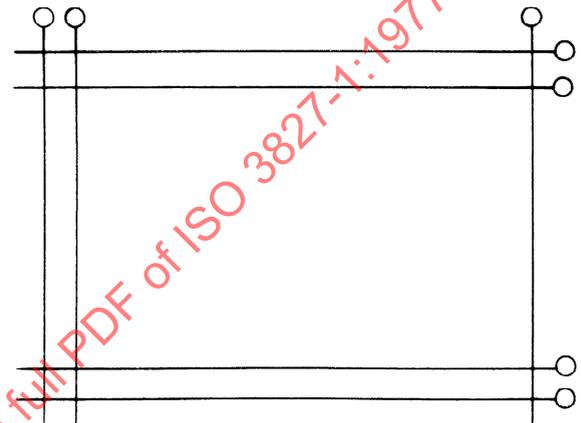
Certain known datum lines, which are related to user requirements, can be identified within the structure and the structure can be divided by these datum lines into a number of spaces. Some of these spaces are termed "usable spaces", for example cabin interiors, and others termed "zones" are the spaces surrounding the usable space and are allocated to the structure or services. These terms are described later in this clause. The principal dimensions of these zones and spaces can be standardized to give a limited range of sizes, which are multiples of the standard modules, but achieve a considerable degree of variety reduction, in relation to particular components. These dimensions are therefore termed "controlling dimensions". The identified datum lines which define the zones and usable spaces are termed "controlling lines" and in three-dimensional considerations the planes which these lines represent on plans, sections and elevations are termed "key reference planes". The entire framework of planes, zones and dimensions is described as the "controlling reference system".

4.1 Lines and planes

4.1.1 Controlling lines

"A line representing a key reference plane."

Controlling lines are the identifiable datum lines which indicate the main structural items such as deck levels, ceiling levels, bulkheads, etc.



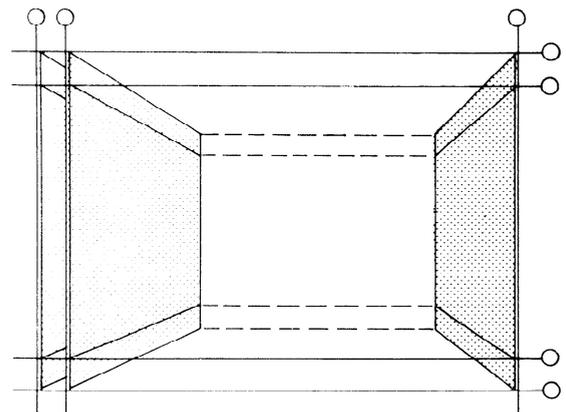
4.1.2 Key reference planes

"A reference plane which defines the boundary of a controlling zone or the axis of a bulkhead, etc."

These are the three dimensional planes represented by the controlling lines on plans, elevations, etc.

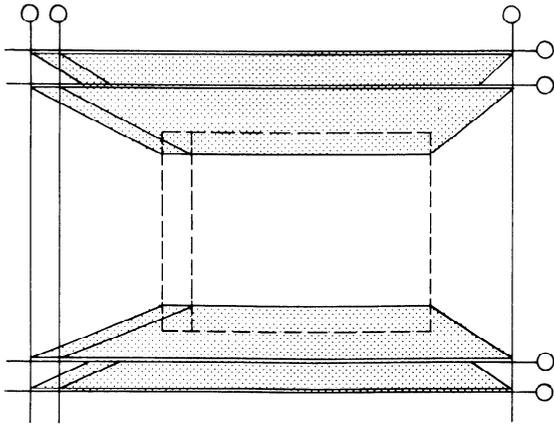
4.1.2.1 VERTICAL KEY REFERENCE PLANES

These are the planes relating to the finished surfaces of bulkheads, linings, casings, etc.



4.1.2.2 HORIZONTAL KEY REFERENCE PLANES

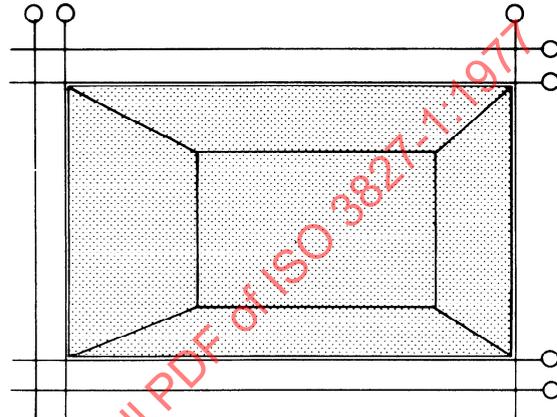
These are planes relating to finished horizontal surfaces such as floor, deck, ceiling, etc.



4.2.2 Usable space

“The space between controlling zones in which human or mechanical activity takes place.”

Vertically, usable spaces are bounded by finished floor and ceiling planes and horizontally they are the spaces between bulkheads or linings.



4.2 Zones and spaces

The effect of delineating the key reference planes on the structure is to divide it into a number of zones and usable spaces. When the principal dimensions of these zones and spaces are standardized a controlling reference system is achieved which will accept modular components.

4.2.1 Controlling zones

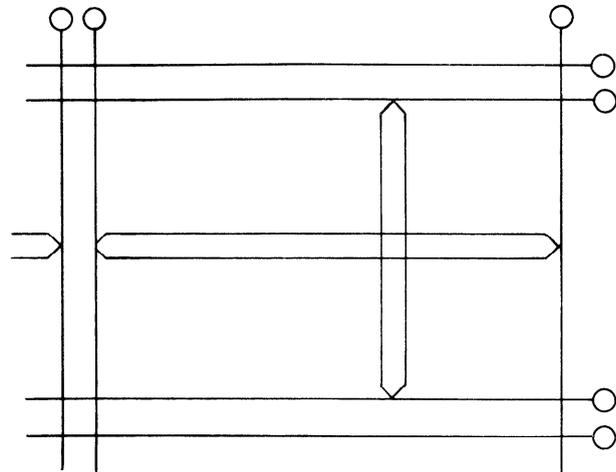
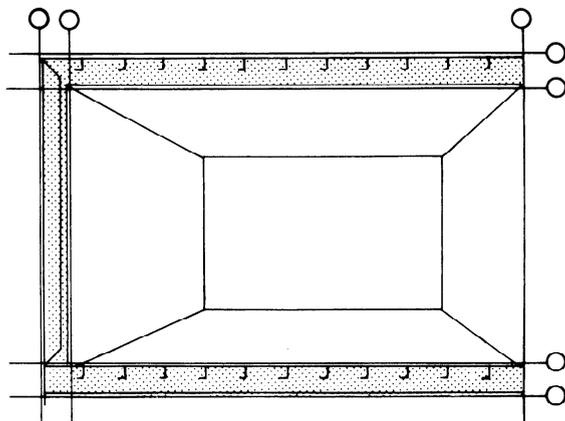
“A zone between key reference planes provided for a deck, deckhead, bulkhead or lining.”

This is a space, having standardized dimensions, which is allocated to a part of the structure. It may be occupied, but not always filled, by one or more components. In principle, finishes should be contained within the zone.

4.2.3 Controlling dimensions

“A dimension between key reference planes, for example deck to ceiling height, and width of controlling zones.

These are the standardized principal dimensions of zones and spaces and are expressed as a selection from the range of multiples of standard modules. The controlling dimensions will be given in a separate part of the International Standard on dimensional co-ordination in shipbuilding.



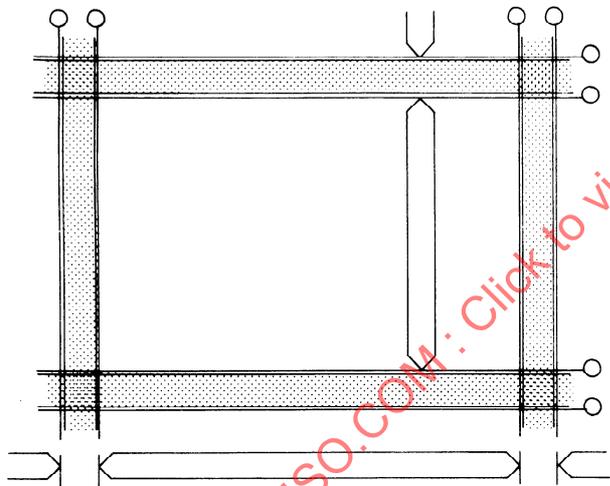
5 CONTROL : BOUNDARY AND AXIAL CONTROLLING LINES

In applying the controlling reference system to a design there are two methods for locating the controlling lines in relation to the structural or subdivision zones.

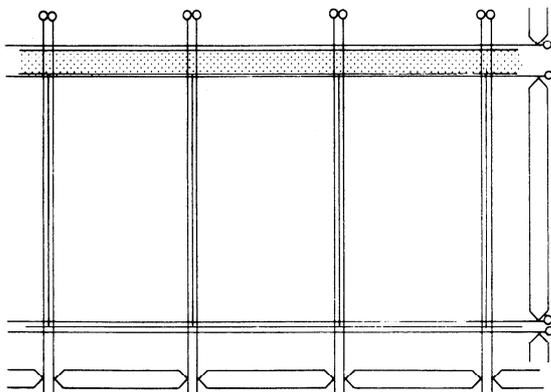
5.1 Method 1 (preferred) : Controlling lines on the boundaries of zones

Controlling lines on the boundaries of zones, i.e. on either face of the zone, are recommended as the method which will give the most benefit in accommodation areas, especially where repetitive arrangements occur, such as a row of similar cabins.

The main advantage of face dimensioning, where the controlling lines occur on the boundaries of zones, i.e. at the junction of components, is that there is then a usable space for components and assemblies which bears a direct relationship to the controlling dimensions regardless of the size of the zones.



In practical applications this method enables co-ordinated components abutting bulkheads, linings, etc. to be positioned within the usable space, without the need for special fitting or make-up pieces to compensate for the variations in the width of the zones which contain the bulkheads, etc.

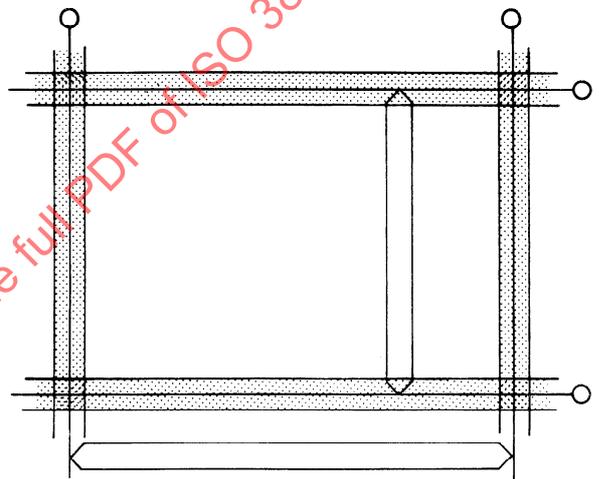


5.2 Method 2 : Controlling lines on the axial lines of the zones

NOTE — The lines are generally placed on the true axis of the zone but may be positioned anywhere within the zone.

This method may be employed in the positioning of zones, but the varying width of zones for bulkheads, linings, etc., will necessitate special fittings or make-up pieces in order to utilize modular components.

It may, however, be desirable to integrate both methods in certain instances in order to obtain the maximum utilization of modular components.



6 CONTROL : CONTROLLING DIMENSIONS

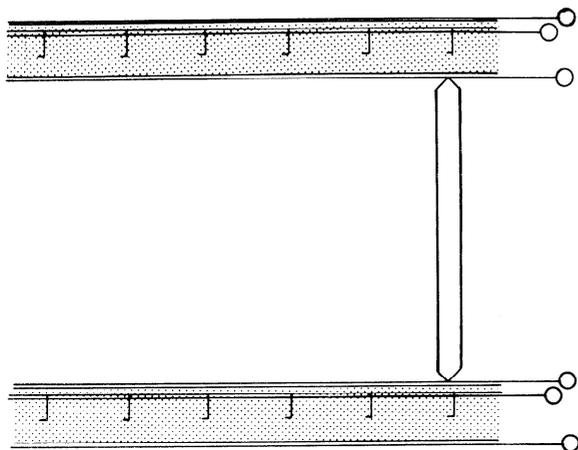
Recommendations for the sizes of controlling dimensions are given in ISO 3827/IV. The object of these recommendations is to provide a framework of controlling dimensions for use in the design of ships' deckhouses and accommodation and for guidance in the selection of co-ordinated sizes for components.

6.1 Vertical controlling dimensions

Vertical controlling dimensions are the dimensions for the deck to ceiling height.

In order to make the maximum use of dimensionally co-ordinated components, a rectilinear structure is preferable and ISO 3827/IV contains a recommendation that wherever possible flat decks without camber or sheer should be arranged and the recommendations are based on this

premise. If camber and/or sheer is present careful consideration should be given to the design in order to give the maximum possible degree of co-ordination.



6.1.1 Deck to ceiling height

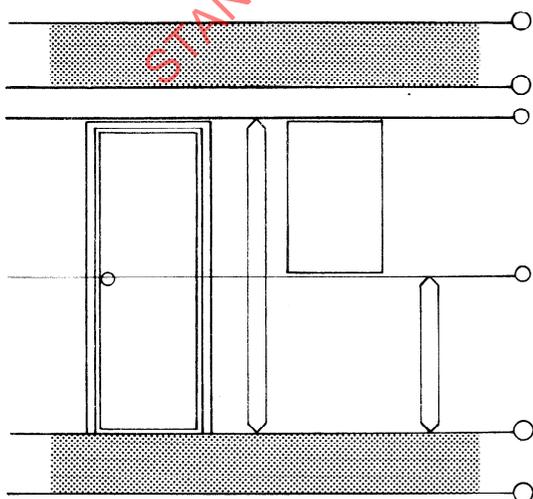
Controlling dimensions for the deck to ceiling height are measured between controlling lines situated on the boundaries of the finished floor to ceiling zones.

This dimension is of primary importance in the co-ordination of dimensions for shipbuilding as the maximum benefit would appear to derive from standard components for deckhouse subdivision, i.e. bulkhead and lining panels.

Heights in multiples of 100 mm (preferred) or 50 mm may be selected.

6.1.2 Intermediate vertical controlling dimensions

Intermediate vertical controlling dimensions are the dimensions for the height of window, sidelight and doorset heads and for the height of window and sidelight sills above the controlling plane at floor finish level. In relation to windows and sidelights these dimensions govern the position of the openings in linings to take window boxes rather than the position of the window itself.



6.1.3 Height of zones

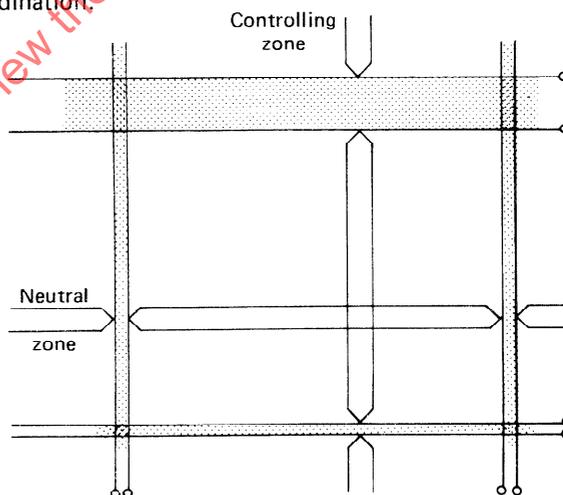
The zones which contain the deck and finish, services and ceiling are governed by the physical requirements for these items together with the deck structure. The height of the zones will be decided by these physical requirements and the tween deck height in order to achieve a preferred dimension for the deck to ceiling height.

6.2 Horizontal controlling dimensions

Horizontal controlling dimensions are for the width and spacing of controlling zones for the structural bulkheads, linings, etc., and for the spacing of zones for subdivision bulkheads.

The controlling lines to which the dimensions are located may be positioned either on the boundaries or on the axes of the zones.

As in the vertical controlling dimensions, a rectilinear structure is preferable for the maximum use of co-ordinated standard components and ISO 3827/IV makes a recommendation that, wherever possible, raked and/or cambered house fronts, shaped house sides and sloping side shell should be avoided or obviated internally. Wherever shaping is present, consideration must be given to its effect in order to obtain the maximum possible degree of co-ordination.



6.2.1 Spacing of zones

Horizontal controlling dimensions given in the table for the spacing of zones are applicable to both axial and boundary methods and refer to the horizontal distances between the controlling lines for the zones.

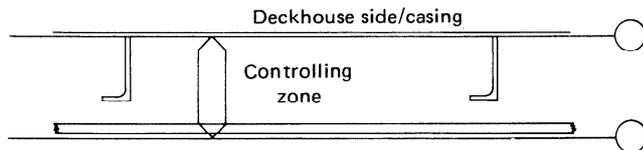
<p>First preference Multiples of 300 mm from 300</p>
<p>Second preference Multiples of 100 mm from 300</p>

6.2.2 Width of controlling zones

Horizontal controlling dimensions for the width of controlling zones refer to the dimensions within the boundaries of zones.

These sizes are for the zones such as deckhouse side or casing and include structure, space for services, fixings and finished linings.

The sizes of controlling zones should be in multiples of 50 mm, although some deviation may be required by structural arrangements.



6.3 Neutral zones

ISO 3827/II defines a neutral zone as "a zone which interrupts the regular increments of a reference system".

Neutral zones are used to accommodate non-modular sized components; in the shipbuilding application these may be for subdivision bulkheads, and the size of the zone will be determined from the actual thickness of the panels, plus finishes, fixings, etc. but not including trim.

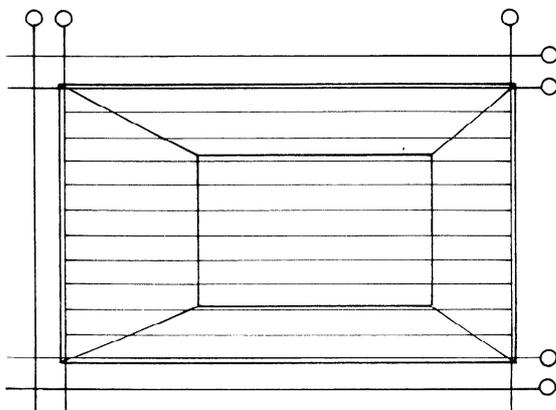
7 LOCATION OF COMPONENTS

Components and assemblies should be located in a space within the reference system defined by reference planes or lines in the system, the co-ordinating space. This space should include the space required for joints and tolerances or deviations.

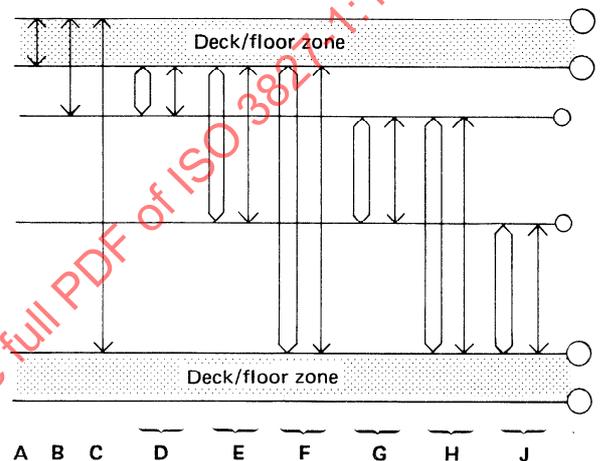
In co-ordinated planning, different methods of locating components may be applied and a distinction is made between vertical and horizontal location.

7.1 Vertical location

For vertical location a component only requires a single dimension from it to the finished floor plane. This dimension should accord with the recommendations for vertical controlling dimensions and intermediate vertical controlling dimensions contained in ISO 3827/IV.



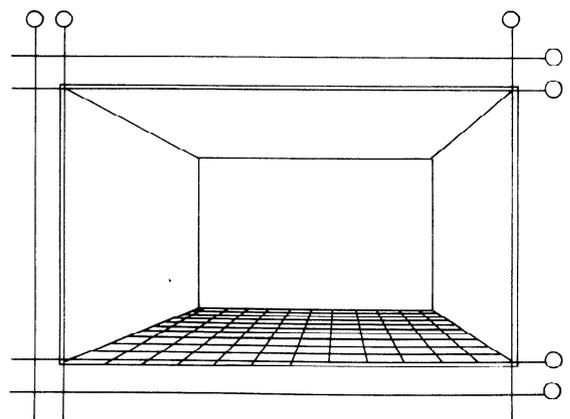
The total possible range of vertical co-ordinating spaces derived from controlling and intermediate controlling lines is restricted, in the shipbuilding application, to those for internal subdivision, as shown in the sketch. The spaces shown are given a reference letter for ease of identification, and are referred to as space types. Related components and assemblies will not necessarily contain all the space types and only those types commonly associated with particular components will be considered in the tables of co-ordinating spaces to be published in subsequent International Standards in this series, for example internal door-sets commonly include space types F and H.



NOTE It will be noted that space types D to J, which occur between controlling lines, are related to controlling dimensions.

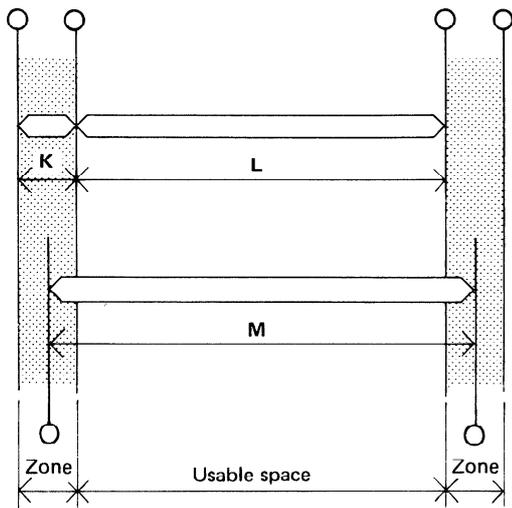
7.2 Horizontal location

For horizontal location, components require location in two directions; for this reason it is convenient to introduce a grid to which they may be related. A grid is defined in ISO 3827/II as "a rectilinear network of reference lines in one plane" and as such it is intended as a reference tool for the layout of modular designs. The horizontal dimensions for components derived from the grid should be based upon the horizontal controlling dimensions for width and spacing of zones.



The relationship of components, grids and controlling lines will depend upon the size of grid, the sizes of the zones and whether the controlling dimensions are on the faces or axes of zones.

The range of space types for horizontal co-ordinating spaces is limited to three, i.e. width of zone, face spacing of zones, and axial spacing of zones. These types are also given identification reference letters.



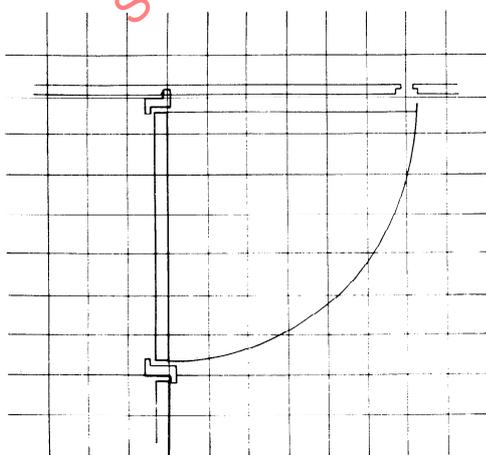
NOTE — It will be noted that space types L and M, which occur between controlling lines, are related to controlling dimensions.

7.3 Location : grids

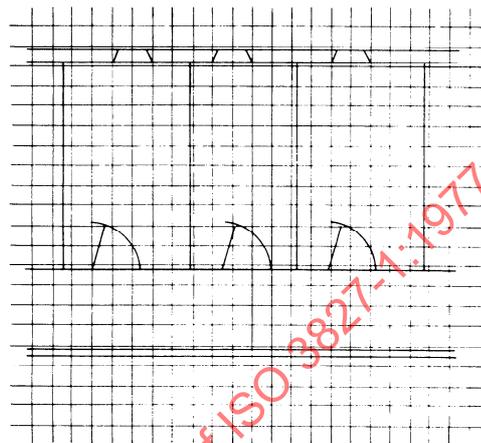
The advantage of using various grids on drawings is that they provide a reference system for sizing and positioning modular components both for the designer and for those reading the drawings.

7.3.1 Size of grid

The basic module grid, i.e. with spacing of 100 mm between the lines, is sufficiently small to show detailed construction and the precise relationship of components, and would generally be used on drawings to scales of 1 : 50 and 1 : 20.



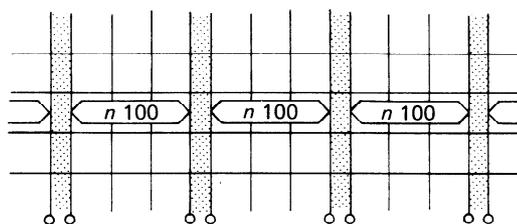
The 300 mm grid is more convenient for layout drawings. On this grid the components will often be offset from the grid lines. This grid would generally appear on drawings to scales of 1 : 200 and 1 : 100.



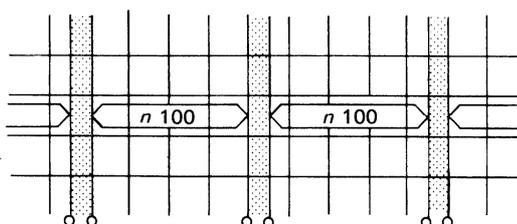
7.3.2 Application of grids

In applying grids to the layout of ships' accommodation areas, the relationship between the grid and the zones will vary with the size of the grid, the width of the zones, the method employed for spacing the zones and the alternative of continuous or interrupted grids.

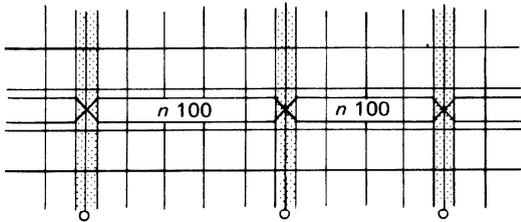
Interrupted grid : It is recommended that for ease of detail design an interrupted grid be employed to accommodate the varying widths of zones. Controlling lines are positioned on the faces of the zones and the spacings of zones are multiples of 100 mm. This method will ensure that the usable space, where the maximum benefit from co-ordinated components will be obtained, is always fully modular.



Continuous grid : In the initial planning and layout of the accommodation areas it may be convenient to utilize a continuous grid but in this instance varying relationships between the grid and zones will be apparent. Great care must therefore be taken to ensure that allowance is made for the widths of the neutral zones contained within a particular layout.



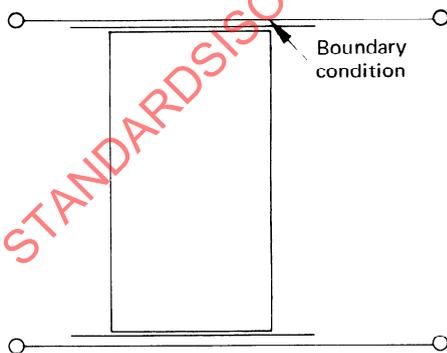
Axial spacing may also be employed with a continuous grid, but this method is not recommended as the usable space between zones then varies with the width of the zones.



7.4 Location : zones

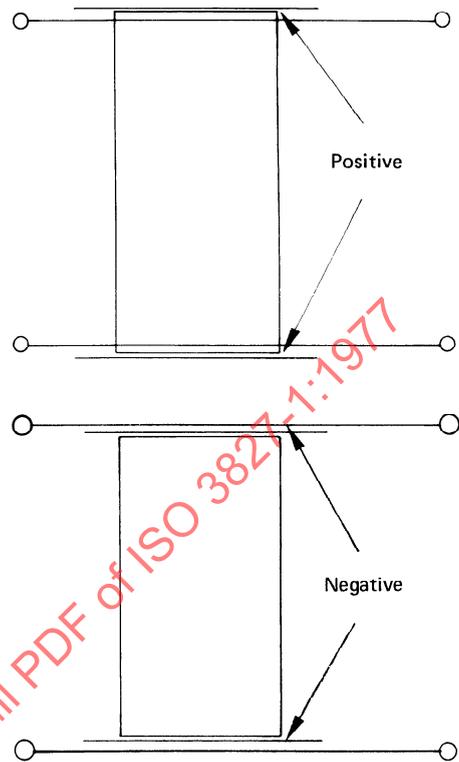
7.4.1 Penetration of zones

The range of co-ordinating spaces derived from the controlling and intermediate controlling lines may be regarded as preferred ranges. However, it is sometimes essential that a component within a co-ordinating space should penetrate the adjoining zone or stop short of it. This relationship between the key reference plane, which defines the boundary of a controlling zone, and the reference plane which defines the boundary of the co-ordinating space for a component or assembly is known as a boundary condition.



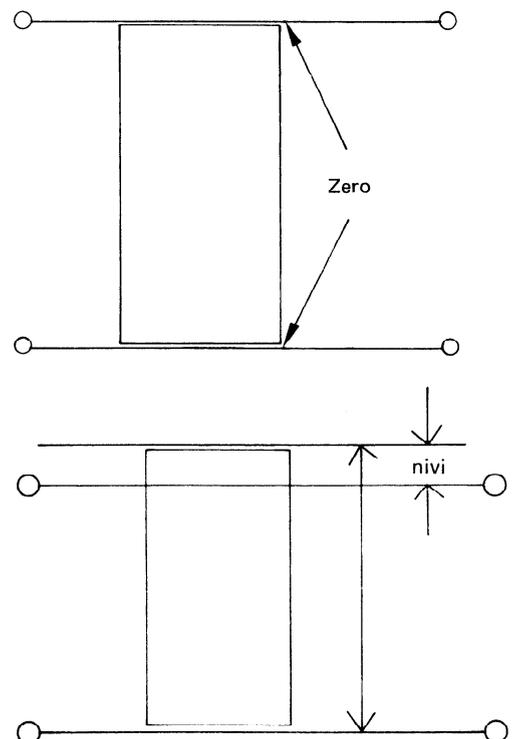
7.4.1.1 POSITIVE AND NEGATIVE BOUNDARY CONDITION

Boundary conditions are positive where the co-ordinating space extends past the key reference plane, and negative where the co-ordinating space stops short of the key reference plane.



7.4.1.2 ZERO BOUNDARY CONDITION

The preferred co-ordinating space, whose boundary is coincident with the key reference plane, has a zero boundary condition.

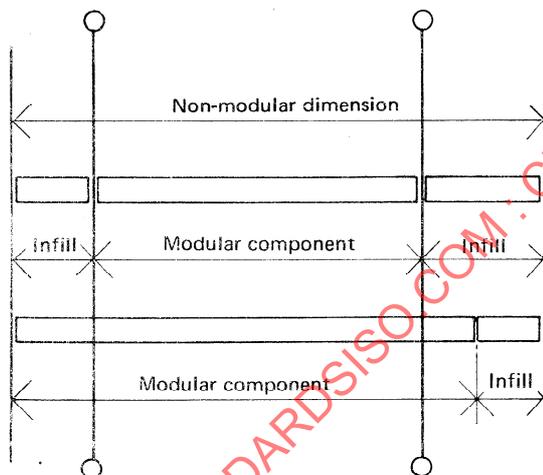


In the instances where penetration of the zones is necessary for functional requirements it is desirable that the depth of penetration should accord with the standard modules, or increments of size, given in ISO 3827/III, in order that the component remains modular.

The total range of co-ordinating spaces is obtained by the addition or subtraction of boundary conditions to the preferred co-ordinating spaces, but wherever possible, in the interests of standardization of components, boundary conditions should be limited to zero conditions. As a practical example the accompanying sketches indicate the relationship between a bulkhead panel and the finished floor and ceiling controlling lines.

7.4.1.3 INFILL PIECES

Where the final co-ordinating space, derived from the preferred range and the boundary condition, is non-modular it is usually possible, in assembly, to arrange that the space can be filled by the use of modular components and "infill" pieces. The use of "infill" or "make-up" pieces will increase the flexibility of a limited range of modular components so that they can be adapted to fill a wider range of co-ordinating spaces.



8 SELECTION OF COMPONENT SIZES

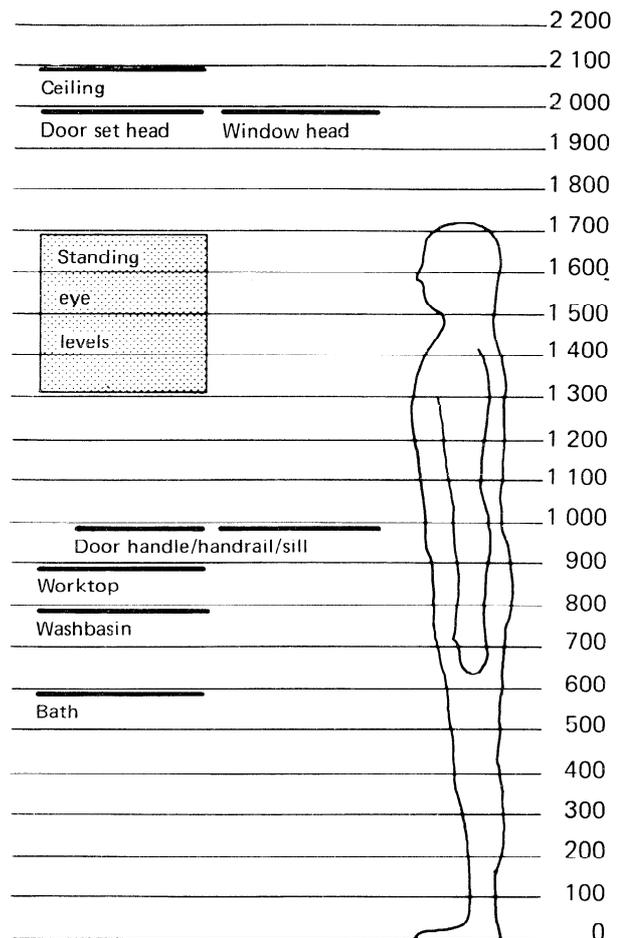
The total range of co-ordinating spaces obtained by adding or subtracting the boundary conditions can be very wide, but it is not necessarily essential to produce a range of components to fill all these spaces. In the interests of standardization a reduction in the range is desirable and in selecting a range of sizes for modular components the objective is the development of a limited range of sizes giving maximum flexibility of assembly for the component. Flexibility is the measure of the number of different co-ordinating spaces that a component range can fill, both singly and in various assembly combinations.

Components that can be assembled or coupled in combinations are termed "additive" components. Several factors which influence the selection of co-ordinated sizes for components need to be considered to achieve the most flexible additive range. These factors are : ergonomics, economics, frequency of use, flexibility, compatibility and interchangeability. From consideration of these factors it will be possible to select certain preferred sizes and in some instances to identify key components, which are those components having a particular significance, and are described later, in detail.

8.1 Ergonomics

Any space within which humans live or work must be related to both the body dimensions, obtained from anthropomorphic data, and the dimensional requirements for activities which are determined from ergonomic data.

As the methods of measurement are fairly coarse, a dimension based upon multiples of 100 mm is sufficiently fine for most applications but certain sizes, such as height of worktops, may require smaller increments.



8.2 Economic usage

The size of any component is limited in its maximum and minimum dimensions by the economic use of materials, manufacture, storage, handling and transport. These factors will be determined by individual manufacturers and industries.

8.3 Frequency of use

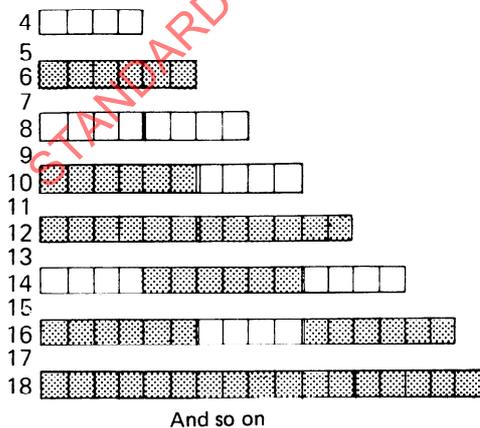
An examination of the anticipated frequency of use for each component will inevitably identify certain sizes as being more frequently required than others. Wherever this preference or weighting is established it will be indicated in the tables of co-ordinating sizes which will be drawn up for the shipbuilding industry at a later stage in the development of dimensional co-ordination.

8.4 Flexibility

In order to achieve the maximum flexibility of assembly for a component a method must be found of arriving at the smallest range of components which, when in combinations, can fill the greatest range of co-ordinating spaces.

The mathematical technique called "combinations of numbers", which is based on the use of certain mathematical equations, is an established method for determining groups of numbers which will achieve this aim.

In selecting two sizes for a component, for example, if these sizes have a common factor it will be impossible to combine these sizes to fill all the spaces. In the example shown with sizes of 4 and 6 it is impossible to achieve any odd numbers, because they have a common factor of 2.

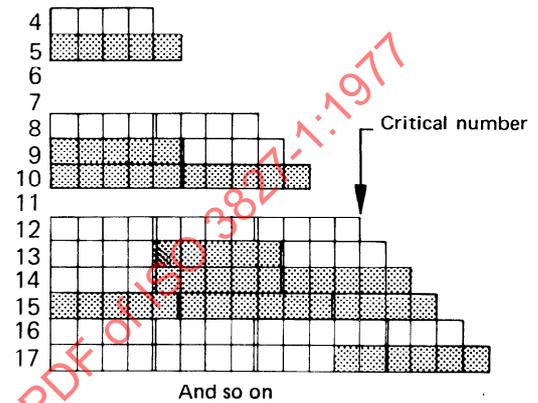


If, however, two numbers are chosen which have no common factors, in which case they are said to be relatively prime, these will combine after a particular point to fill every space. This particular point is termed the critical number and is given by the formula $(a - 1) (b - 1)$ where

"a" and "b" are the sizes. In the example shown with sizes of 4 and 5 the critical number is given by :

$$\begin{aligned}
 N &= (a - 1) (b - 1) \\
 &= (4 - 1) (5 - 1) \\
 &= 3 \times 4 \\
 &= 12
 \end{aligned}$$

Hence all spaces above 12 will be filled.

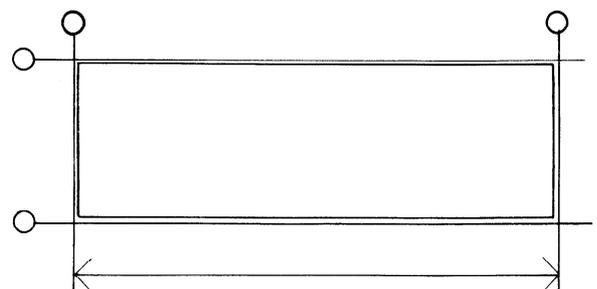


A similar technique can be employed with three or more numbers to arrive at the best range of sizes for flexibility of the components. The range of numbers and the derived critical number can obviously be related to numbers of any units; in the dimensional co-ordination framework they will generally be in terms of the 100 mm increment of size. Hence in the last example, components of 400 and 500 mm will fill all spaces larger than 1 200 mm which are multiples of 100 mm.

A practical example occurs in the division of rigid flat sheet materials such as bulkhead panels where the division of a panel 1 200 wide into two 600 panels would only give 600 flexibility, but by dividing it into 700 and 500 wide panels greater flexibility is achieved and a critical number of 2 400 is obtained, above which all sizes in multiples of 100 can be filled.

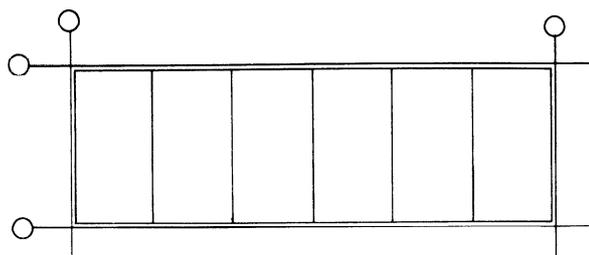
8.5 Compatibility and interchangeability

With the adoption of dimensional co-ordination, components will be required in far fewer sizes than at present, and the same range of sizes will apply to components with similar functions, without the minor variations in dimensions which are now encountered.



Co-ordinating space, for example bulkhead

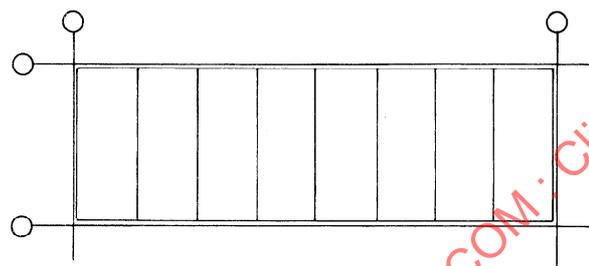
These similar components will be interchangeable in isolation but in order to achieve complete interchangeability the relationship between adjoining components will also require to be rationalized. This relationship with adjoining components is termed compatibility.



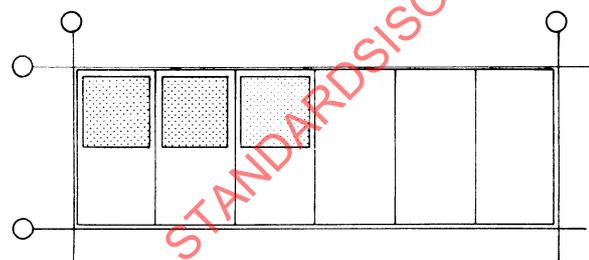
Co-ordinated bulkhead components

Compatibility can be achieved not only by standardizing sizes and location in relation to the grid reference lines but also by an agreed system of tolerances and by rationalizing the joining profile of the components.

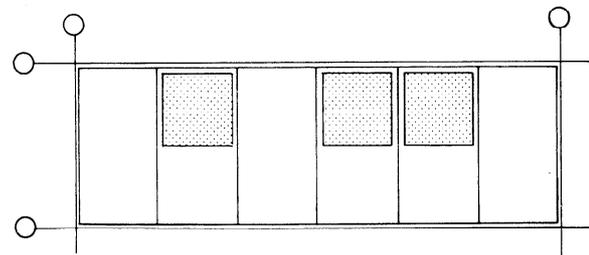
By designing components so that they are compatible with each other and combining sizes to give maximum flexibility it is then possible to exchange components within an assembly, and to change sizes, materials, positions and functions without affecting the overall co-ordinating size of the assembly.



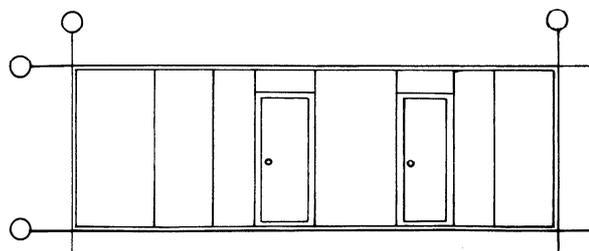
Change of size



Change of material



Change of position



Change of function

8.6 Key components

Within a preferred range of co-ordinating sizes certain particular sizes may be identified as being of greater significance in terms of dimensional co-ordination because of their frequency of usage, economic production, flexibility, etc. These components are termed "key components" and while in themselves they will not fulfil all the requirements for a range of sizes, it is anticipated that they will indicate the main bulk of the demand and should be included in all manufacturers' ranges for the component.

It is intended that the key components will be identified within the tables of co-ordinating spaces to be published in subsequent International Standards in the dimensional co-ordination series and that wherever possible these will correspond to the key components recognized for other industries using related products.

9 ASSEMBLY

One main objective of dimensional co-ordination is to avoid cutting components on site, and in order to achieve this at the assembly stage the actual size of components and the design of the joints needs to be rationalized.

The co-ordinating size for a component and the co-ordinating space allocated to it are in theory identical, but in practice, the actual size will vary in manufacture. To arrive at the maximum and minimum limits of size for a component requires an agreed procedure for determining the margin which provides an allowance for tolerances, movements and jointing.

An agreed procedure for the determination of tolerances is under study within the building construction industry¹⁾, and in view of the commonality of certain components it is hoped to adopt these procedures for the shipbuilding industry.

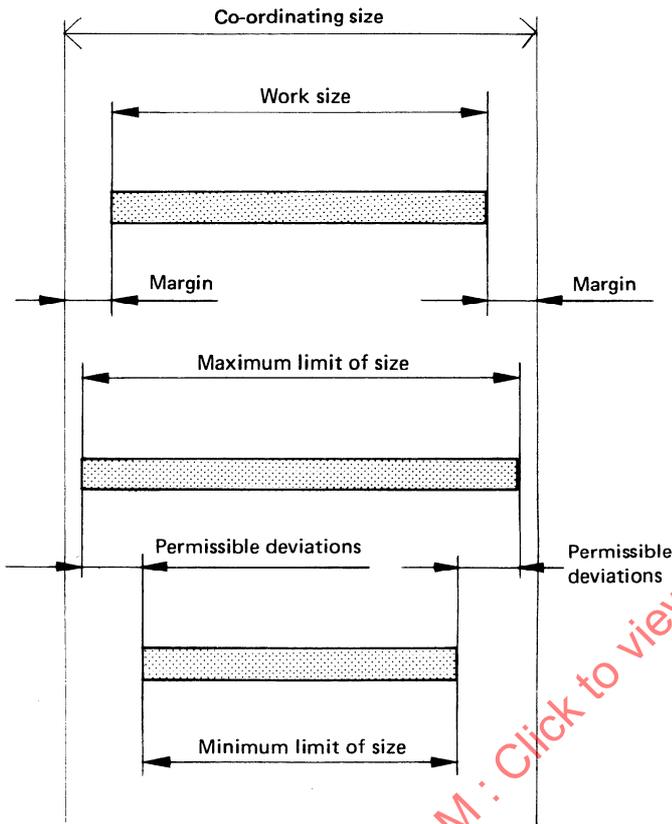
At the assembly stage it is essential that an understanding of dimensional co-ordination and its application be applied to the practical aspects of setting-out or marking-off the structure so that the maximum benefits in ease of assembly are obtained. The accuracy with which the first components are assembled is extremely important and will determine the space available for fitting other components within the co-ordinated framework.

1) ISO/TC 59, Building construction.

During assembly the installation of services will need to be carefully controlled to ensure the minimum interference with adjacent components, for example within a deck zone, and to ensure wherever possible that the terminal connections and appliances are dimensionally co-ordinated where they impinge upon the co-ordinated usable spaces.

10 PRACTICAL APPLICATION : Figures 1 to 9

The figures which follow are intended to illustrate the application of dimensional co-ordination to ships' deck-house accommodation in various stages of the design. The sizes indicated for components, although shown as co-ordinated, should not be regarded as recommended sizes. In due course recommendations for the sizes of components will be issued by ISO. The conventions given in the note to 3.2 are used in the examples and are recommended for clarity in dimensionally co-ordinated drawings.



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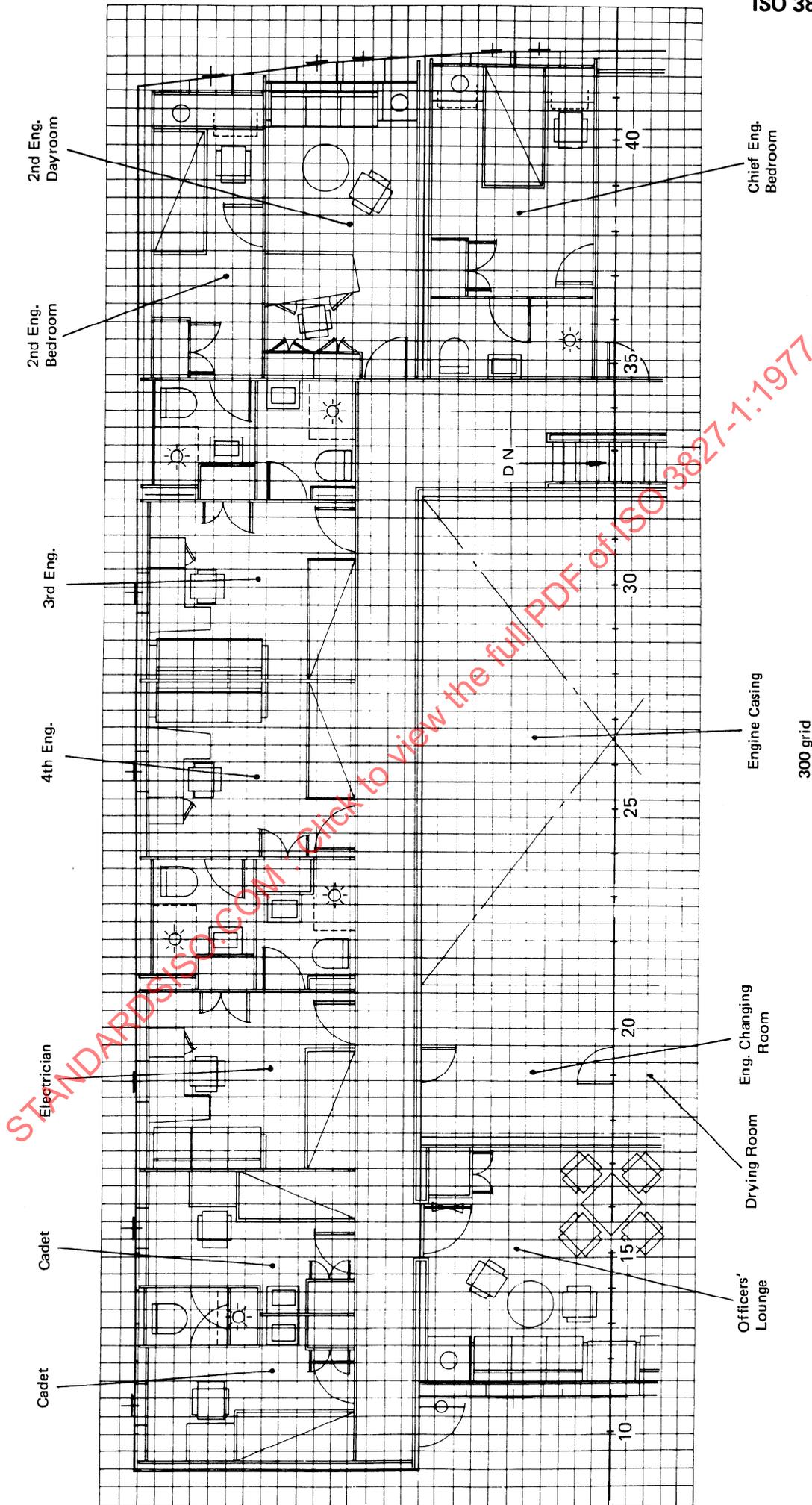
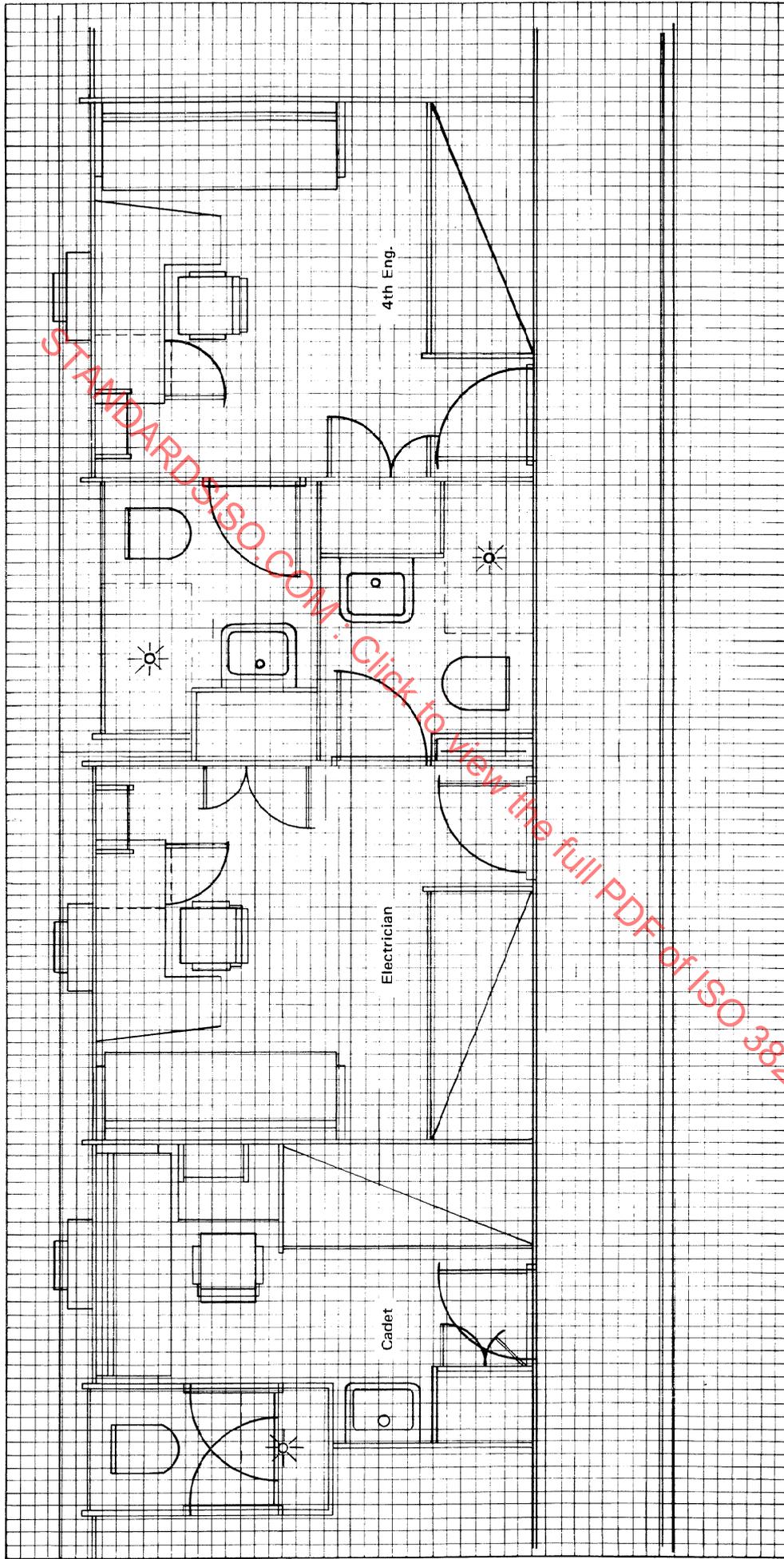


FIGURE 2 — General cargo ship, bridge deck : general arrangement, scale 1 : 100

300 grid



100 grid

FIGURE 3 — General cargo ship, bridge deck : accommodation layout, scale 1 : 50

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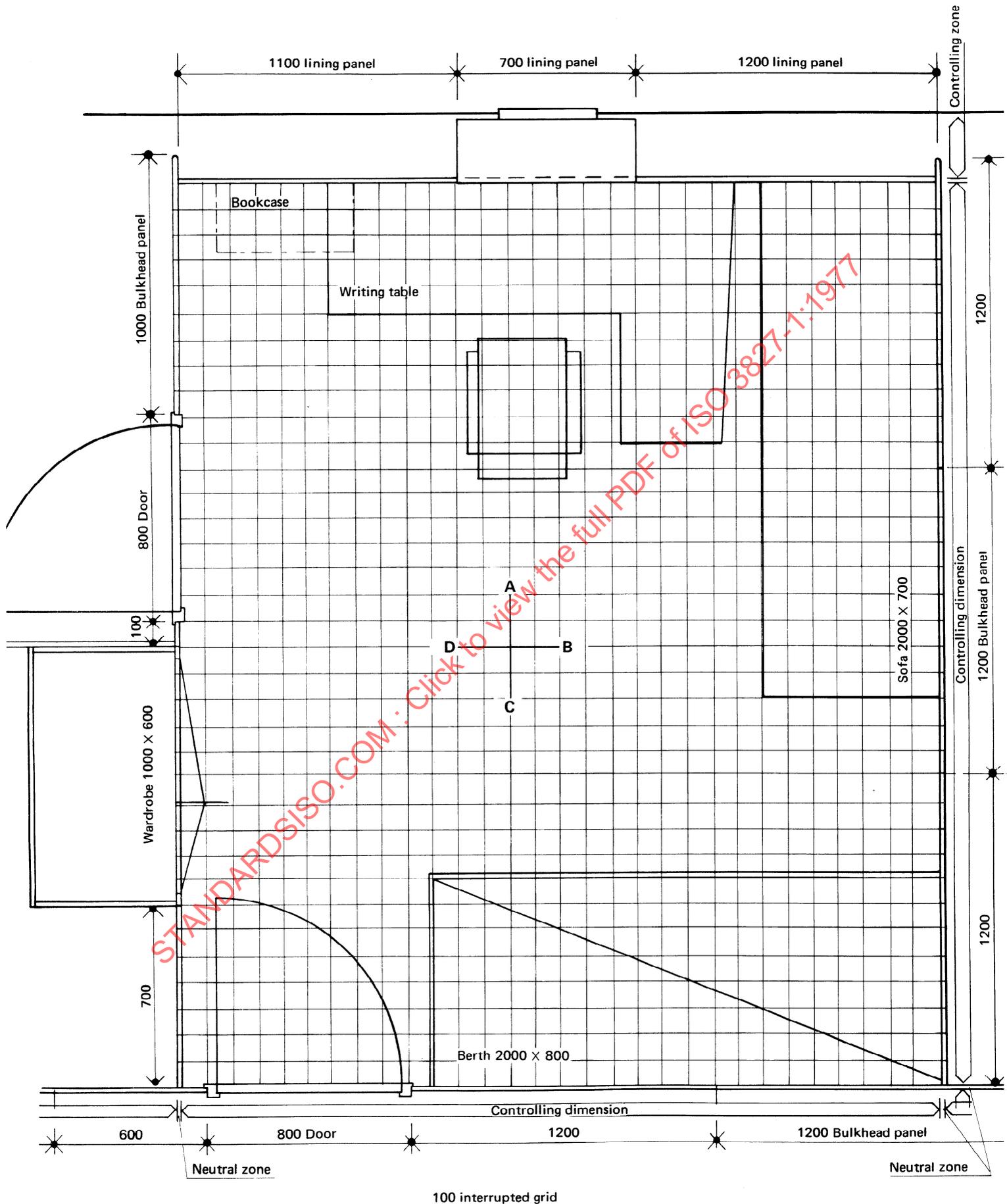


FIGURE 4 – Typical officer's cabin : space plan, scale 1 : 20