BMN
Building Metrication News

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This section appears in the second and fourth issues of 'Building' each month, and gives current news and information on metrication, as well as providing a forum in which the ramifications of the change to metric can be freely discussed. It is published in association with the Modular Society.

CONTENTS

Functional Group Panels about to report

In about two weeks' time the first three of BSI's Functional Group Panels will be putting their recommendations to their parent committee B/94 and B/94/4. The recommendations will provide a basis for sizing components for structure, external envelope and internal sub-division. They will represent the results of 12 months' intensive work by representatives of all sectors of the industry, of BSI staff and of the government's Component Co-ordination Group. They also represent a job of work achieved in the face of a terribly tight programme and despite inadequate funds.

The objective of the Functional Group Panels was to provide BSI's Technical Committees, the committees which prepare individual product standards, with a basis for selecting metric modular sizes from BS 4011; Basic Sizes for Building Components and Assemblies and BS 4330; Controlling Dimensions, which at the same time ensured the co-ordination of sizes between inter-related components.

To carry out this task it was necessary to prepare component lists for each functional group and then to allocate a dimensional priority to each component. The priorities were originally proposed in the BSI programme as stages 4, 5, 6 and 7. For convenience these are now termed A, B, C and D. Group A is for components for which dimensional co-ordination is essential. Group B is for components which take their cue from Group A. Group C is for components which are not dimensionally related to either A or B but which would normally be sized in accordance with BS 4011, and Group D is for components which only require to have sensible metric sizes. These lists, which will be an essential guide to Technical Committees and to manufacturers, will be published shortly as one of BSI's PD documents.

The recommendations of the first three Functional Groups Panels depend, as one can imagine, on a mass of data. Much of this data will be valuable to those applying the recommendations and one of the problems will be how much of it to include in the resulting British Standard. If too little is published the recommendations may appear to lack evidence and if too much is published BSI will be accused of perpetuating bumpf. It has been agreed that the recommendations will be published as a British Standard and not as a PD document. As such it will go out to industry for comment.

If committees B/94 and B/94/4 approve the draft Standard at their forthcoming meetings with a great deal of modification then they will be processed and issued for comment. Allowing time for this, for receiving comments, for making amendments and for printing, the final Standard should be published in the autumn. This need not hold up the Technical Committees which will need to start on the ominous task of metricating over 400 standards. The committees will have the draft from which to work and will be fed with amendments as they are agreed.

However, the Standard is also intended for components for which there are no product standards. The information will be of great value to industry, determining the sizes of such components, but there is no guarantee that the final standard will not include modifications. It will, however, allow a start to be made even if it would be wise to await final publication before irrevocable decisions are made.

The costs of going metric

There is now universal recognition that the act of going metric will, initially, increase the cost of building. Estimates as to how much this will be vary between 3 and 6% although 5% is a figure that seems to meet with general accord. This assessment, however, needs qualification. Since metrication for buildings on the ground will be phrased over the period 1970-72, contractors will have a gradual immersion into metric. It will be end-1972 before all contracts are affected and by this time some of the effects of the earlier jobs should have been alleviated, i.e., unfamiliarity with metric units and the expensive short run production of metric components. One should, therefore, be careful not to exaggerate the incidence of higher costs. Five per cent for metric contracts does not mean 5% overall.

Metric office building

Components

This article is the third and last of a series by Eric Corker, DipArch, ARIBA, which comprises a preliminary report on a Crown office building in Penrith, the first project to be designed in metric co-ordinated dimensions by the MPBW.

This article provides an outline account of the way that the co-ordinating sizes of some important components were selected so that they would conform both with the dimensional co-ordination policy of the Ministry and to the specific requirements of the project.
The Ministry's policy is to use the relevant British Standards of which as yet only two have been published: the head standard is BS 4011:1966 'Recommendations for the co-ordination of dimensions in building, basic sizes for building components and assemblies.' The relevant recommendations contained therein are:
'The first selection of basic sizes for the co-ordinating dimensions of components and assemblies should be, in descending order of preference, as follows (where 'n' is any natural number including unity):
First: n × 3 decimetres (i.e. 300 mm).
Second: n × 1 decimetre (i.e. 100 mm).
Third: n × 0.5 decimetres (i.e. 50 mm) up to 3 decimetres.
Fourth: n × 0.25 decimetres (i.e. 25 mm) up to 3 decimetres.
The third and fourth preference should not be used for basic sizes over 3 decimetres unless there are strong economic or functional reasons for doing so. The fourth preference is put forward provisionally. There may be a need for other sizes below 0.5 decimetres, but there is as yet insufficient evidence on which to base a firm recommendation.'

Use of grids

The publication of BS 4330 : 1966 'Recommendations for the co-ordination of dimensions' was the first step in implementing the nationally agreed intention to co-ordinate metric dimensions in building in the UK but this deals only with the general framework of *spaces* in building within which metric co-ordinated *components* will be used and the second article of this series described how controlling dimensions were applied in the Penrith offices. Grids were widely used in the design of this building both in determining the size of spaces and sizes and location of components. Three complementary grids were used to deal with the different aspects of the design.
The first was the 900 mm planning grid (described in the previous article) and this was used to regulate the dominant space requirements in the horizontal plane (i.e. the offices on the first and second floors, and the car parking bays on the ground floor under the building). Columns are located axially on this planning grid and the width of the cladding units coincide with it also, thereby establishing synonymity between the perimeter of the building, the structural columns and the dominant planning requirements.
The second grid which was used was a 300 mm 'controlling' grid whose particular function in the horizontal plane was to facilitate finer adjustment of location for internal partitions and walls where the 900 mm planning grid would have been too coarse. As 300 mm is the first preference size of BS 4011, it also provided some coincidence for components which were dimensioned to first preference multiples.
The third grid used was the 100 mm 'basic module' grid (the second preference size of BS 4011) which was used in the detail location of components, particularly at junctions where the 300 mm controlling grid was too large to make the relationships clear.
All these grids are contained one within the other and this close interrelation provides a quick means of checking the effect of decisions taken on one aspect of the design to other aspects; this facility is very useful when the two aspects are dealing with different scales of dimensions, for example, the spacing of columns and the detail of the cladding junction to the columns. Figure 15 sets out the relationship between the three grids.
In a sense, there was a fourth grid, the structural grid, but the important point to note is that the structural grid is *derived* by being a multiple of the 900 mm planning grid, and in no way does it determine the selection of sizes. The internal partitions, the external cladding panels and the columns were the principle components whose sizes and location were closely related to the main planning requirements.

Partitions

The initial assumptions made at the time of working out the sketch plans were that all partitions would be storey height units of 100 mm thickness (i.e. including finishes and tolerances), that all doors would have storey height frames and be 900 mm wide overall framing and that the discipline of the detailed location on plan would be by making the face of the partitions coincide with a grid line (as opposed to the possible alternative of locating the centre of its thickness on a grid line). Partitions which made a junction with the external cladding were located only by use of the 900 mm planning grid, see Figure 16. The face grid discipline of location permitted a 'vernier' adjustment for areas of rooms according to which side of the grid line the partition was placed, see Figure 17. Many of the internal rooms of this building are on a smaller scale (e.g. lavatories and stores) for which location of the partitions at 900 mm intervals did not suit the finer adjustments which were needed for these areas. Therefore, such partitions are located one side or the other, or in the mid-position of the 300 mm controlling grid, see Figure 18, and this arrangement provides a very high degree of flexibility of location.
As the design was evolved and the cost plan began to be built up in parallel with the selection of the actual components, there came a point when the original assumption of the 100 mm thickness for partitions was challenged. After careful study of the needs for sound insulation, fire protection and structure, it was seen that most of the partitions need only be 50 mm thick, whilst just a few would need to be 100 mm thick for lavatory enclosures, some 150 mm thick (i.e. a double 50 mm skin plus 50 mm cavity) for sound insulation and some 200 mm thick for structure (i.e. the staircase enclosure). It was seen that if all the internal partition thicknesses were tailored to the actual requirements of the project, there would be a useful saving in cost.
The initial decision to use 100 mm thick partitions everywhere and located either side of a grid line had created a design principle of having a 200 mm 'zone' for partition location; this size of zone allowed all four of the adjusted thickness for partitions to be accommodated without modifying the original premises, see Figure 19 and also Figure 30 which shows the whole of the second floor plan with the 100 mm, 150 mm and 200 mm thicknesses noted on it; all other partitions are 50 mm thick.

External cladding

The first condition which had to be fulfilled was that the width of the cladding panels should be convenient to the rhythm generated by the office spaces; this was 900 mm (as described in the second article of this series). The second condition governing the design of the panels was the 200 mm wide partition zone centred on a 900 mm grid line, and this determined the limits of the width of the actual window units set in the cladding panels, see Figure 20. Exposed aggregate concrete was the material chosen in respect of the appearance of the building as it was to be sited in this particular town.
There were no standard metric co-ordinated sized panels available that were suitable, so in the interests of economical use of moulds, it was decided to try to use only one size of panel. By placing the cladding panels outside the columns, it was found that in fact only one size was needed (with the exception of the corner pieces). Location outside the columns gave the added advantage of simplifying the problem of providing proper tolerances for erection.
The 300 mm storey height was expected to have generated the same first preference dimension for the height of the cladding units. However, in deference to the climate of Penrith, a technical

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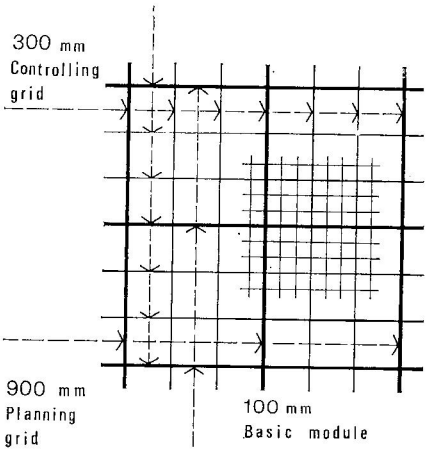

Figure 15. Inter-relationship between grids

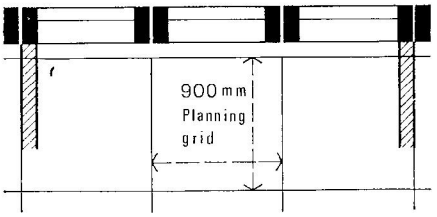

Figure 16. Partitions which meet external cladding have one face or the other on the 900 mm planning grid

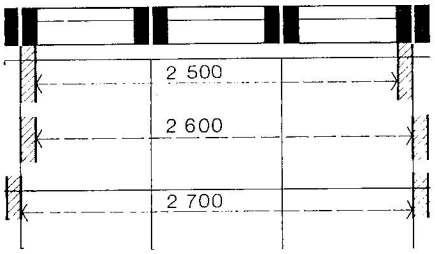

Figure 17. By having one face or the other on the planning grid, this discipline provides a 'vernier' adjustment to the width of rooms

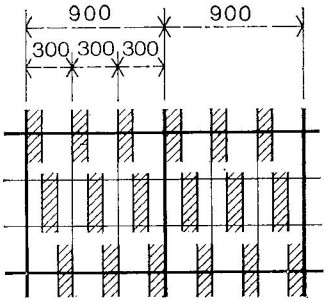

Figure 18. All partitions not meeting the external cladding may have one face or the other on the 300 mm controlling grid or may occupy the mid-position of the grid. (This applies in both axes of the grid)

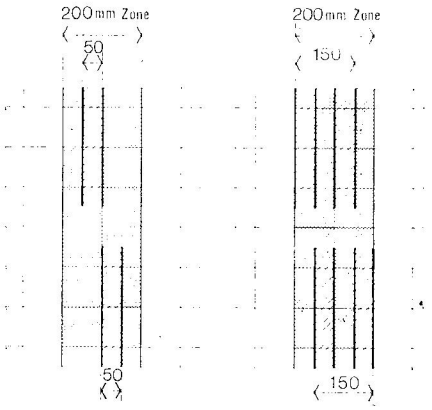

Figure 19. Accommodation of the 50 mm and 150 mm thick partitions in the 200 mm partition zone

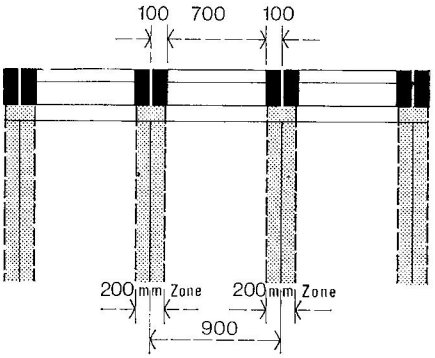

Figure 20. Width of windows is derived from the width of the external cladding panels less allowance for the partition zone

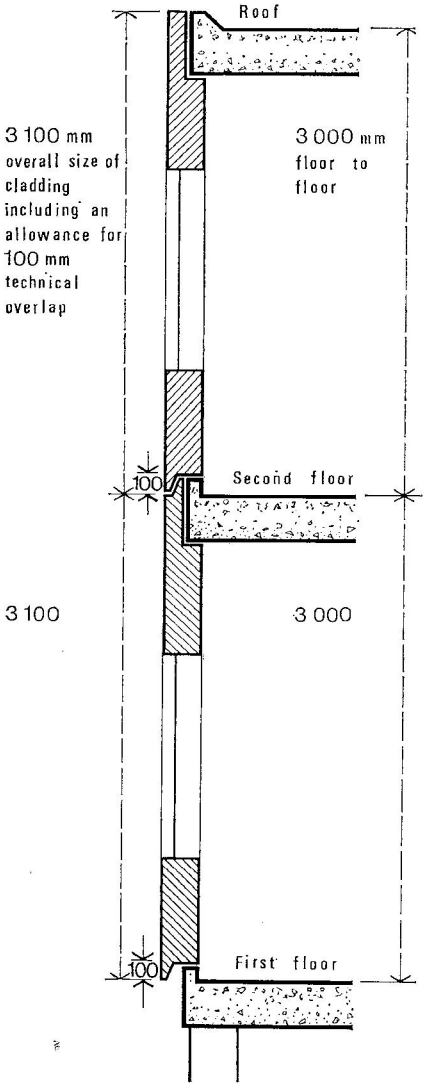

Figure 21 (right). Section showing the relation of cladding panel height to the floor-to-floor controlling dimension

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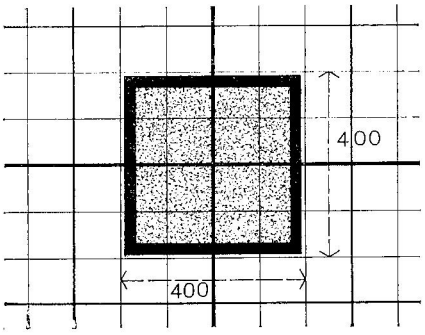
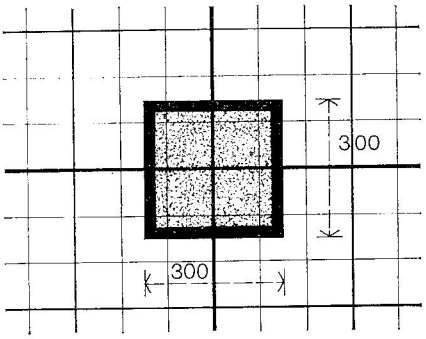


Figure 22 (above). Initial size and location assumptions for columns

Figure 23 (below). Final size and location of columns



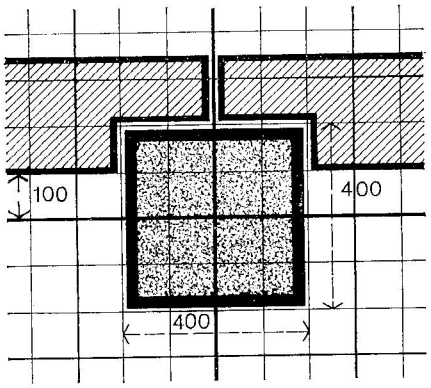
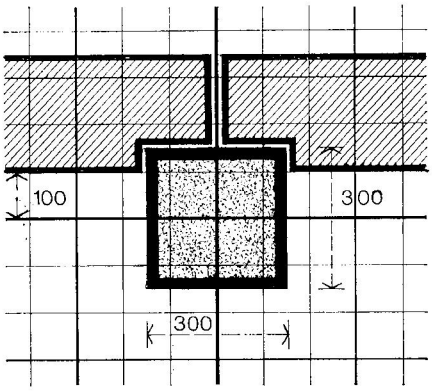


Figure 24 (above). Initial relationship assumptions between external cladding units and columns

Figure 25 (below). Final relationship between external cladding units and columns



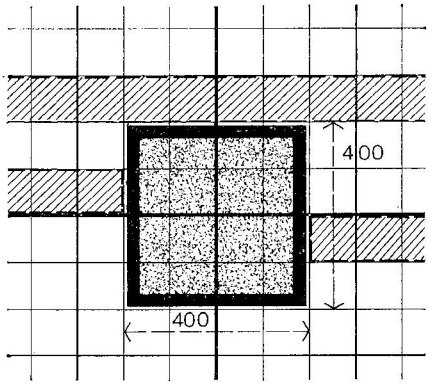


Figure 26. Initial assumptions about possible location of 100 mm thick partitions to 400 mm² columns

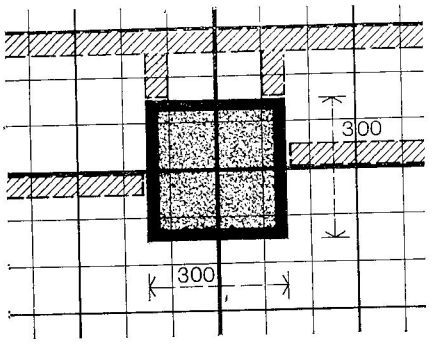


Figure 27. Final possible locations of 50 mm thick partitions to 300 mm² columns

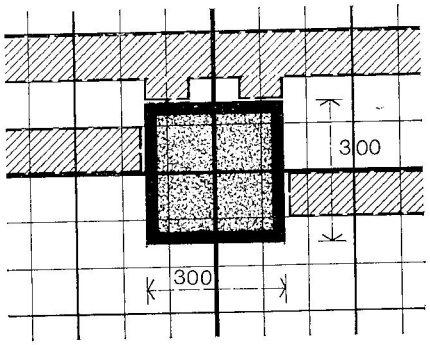


Figure 28. Final possible locations of 100 mm thick partitions to 300 mm² columns

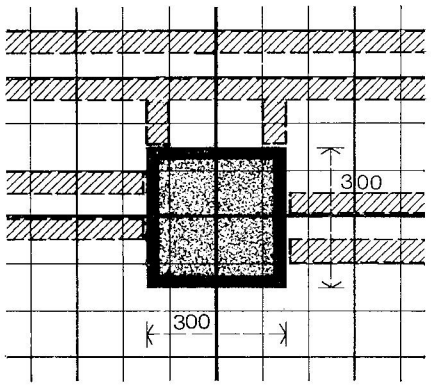


Figure 29. Final possible location of 150 mm thick partitions to 300 mm² columns

overlap of 100 mm was included as weather protection, so although the 300 mm floor-to-floor controlling dimensions creates a co-ordinating dimension also of 3 000 mm (i.e. centre to centre of the panels measured vertically) the actual overall size of the panels is 3 100 mm, see Figure 21.

Columns

The initial structural sketch schemes based upon the early versions of the plan had indicated that the columns would be set in a 400 mm² zone and all be located axially on the 900 mm planning grid; this allowed the face of the columns to coincide with the basic module grid; see Figure 22.

In the event, when the final agreed plan had been evolved and the exact location of all the columns had been established, the final structural scheme offered the possibility of reducing the column section to fit into a 300 mm² zone, thereby achieving a useful cost saving, see Figure 23. But as against this benefit, it did mean that the faces of the columns were no longer coincident with the basic module grid and it was necessary to re-examine the junctions that other components made with the columns; these were mainly with the external cladding panels and internal partitions.

The design of the external cladding panels had allowed for rebated edges on the internal face which notched around columns, see Figure 24 (where panels abut one another away from the columns, the blocking pieces in the mould which form the rebate are merely taken out). All that was necessary to accommodate the reduced size of the column was to reduce the depth of the rebate, see Figure 25. As the location of the external cladding panels did not have to be altered, the area of the building was unaffected.

The original design had anticipated the possible junctions of the 400 mm by 400 mm columns with the 100 mm thick partitions as shown in Figure 26. With the reduction in the size of the columns and the modification of the partition thickness into 50 mm, 100 mm and 150 mm, the possible forms of the junctions are shown in Figures 27, 28 and 29 respectively. Although these modifications have caused some extra making up to be done at the junctions, there was nevertheless an overall saving that could be made by accepting the different thicknesses of partitions. The second floor plan, see Figure 30, shows where most partitions can be 50 mm thick and that only a few partitions need be of greater thickness.

General assessments and summary

Metric units. There appears to be no unexpected difficulties at all in using metric measure by any of the designers beyond the need to be familiar with the new figures.

Grids. The employment of grid drafting provides two main advantages for designers. First, it reduces the difficulties in the change to metric dimensions simply because lines are being used as a measure of size rather than employing a scale rule, and provided

that checks are made on minimum critical dimensions (such as ceiling heights), metric grids which are analogous to familiar imperial sizes may be used in full confidence; thus a 300 mm metric grid may be substituted for a 1ft. imperial grid so long as it is remembered that it is approximately $\frac{3}{16}$in. smaller.

Second, if a system of coincident 'interlocking' grids is used, this will show very clearly in graphic form on the paper exactly where dimensional choices make co-ordination sense. If all the grids are simply and directly related to each other, they provide a stable system of reference so that whatever scale of design problem is being examined, the consequences of decisions are readily understandable at a larger or a smaller scale of work on other problems.

There is a third advantage in using a grid which shows itself in the quality of the drawings because the presence of a well chosen grid helps to make a drawing more 'visible' in two ways. First, it provides what amounts to a built-in scale rule as a means of reference for sizes of spaces and component location; second, and probably more important, it drastically reduces the need for figured dimensions and arrowed lines. Apart from the value of having the drawings clear of a lot of detail, the grid method of presentation is particularly appropriate where the set of plans is built up by using copy negatives (for various purposes such as showing services, finishes, etc.) taken from a base drawing. Thus dimensions which are special to any one operation need only appear on the particular drawing in which they are relevant.

Standardisation and design process. The technology of building is changing in many ways and the present time is a period of rapid transition, the simplest description of which is that building construction is abandoning methods predominantly employing in-situ craft work and adopting methods largely using off-site fabrication of components; this change necessarily means that design procedure and building organisation have to be modified to meet the new situation as it evolves.

In general, off-site fabrication is most economical when components can be standardised, the first step of which is to standardise dimensions—and the essential pre-condition for this to happen is that design dimensions have to be co-ordinated. The principles have been established by the publication of BS 4011 and BS 4330 and the change-to-metric programme is being deliberately used in the UK to help rationalise and control the dimensional aspects of the technological transition of building.

The Crown offices project in Penrith is an interesting example of how the principles of dimensional co-ordination may be worked out in practice in the present conditions where there are very few components available with metric co-ordinated dimensions and where it is, therefore, necessary to design 'specials' as a substitute for 'standards.' Three conclusions may be drawn from this work.

The first is that a considerable amount of detailed constructional design work has to be carried out during the sketch design stage to ensure that in the context of using 'specials,' costs may be kept within prescribed limits when metric co-ordinated dimensions for components are used.

The second conclusion is that co-ordination of dimensions is not sufficient in itself to ensure that standard components will result for universal application. It is also necessary for the arrangement of components to be standardised so that their edge profiles may be suitable for incorporation in other projects without expensive modifications. An example in the Penrith plan is that of external cladding units where a simple, but fundamental, decision was taken to locate them outside the perimeter columns. This condition is likely to preclude their use with any other arrangement (such as being located between columns).

The third conclusion is that the most practical principle to follow in the present circumstances for this size and type of building, is to standardise and simplify as much as possible within the limits of one building to ensure that there are sufficient number of any one design of component to make 'batch' production economic to meet the cost limits.

A great deal of effort is being devoted at present by government departments and others to what is termed 'compatability' to ensure that standard components may be made for wide application in different conditions and different building types. But for this work to be successful in any reasonable degree, it is necessary to qualify all the factors and conditions governing the detailed design of buildings so that standard components may be easily incorporated. Penrith demonstrates the importance of the need for a general agreement on the detailed relationships of component location.

The Penrith Crown office project would seem to be a good example of a relatively simple type of building of the right size which may be used for 'proving' exercises to provide very valuable experience in the present state of building development. It is to be hoped that MPBW will continue to use such buildings for this type of examination.

(Concluded)

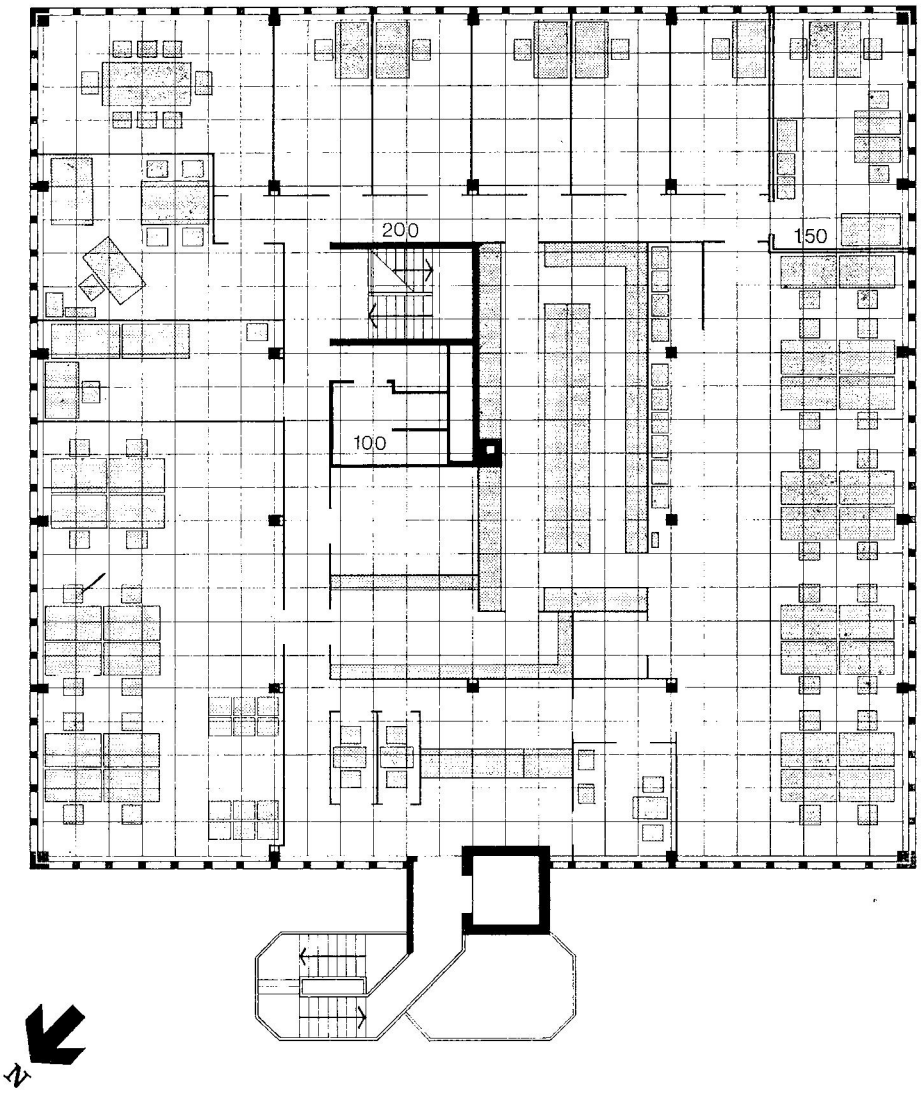


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Figure 30. Second floor plan showing extensive use of 50mm thick partitions and limited use of 100mm and 150mm thick partitions

News from the Industry

Metric housing returns

Figures published recently by the NBA suggest that a significant market is opening up for metric building components.

Over a quarter of all houses to be designed for the public sector in England and Wales in 1969 will be in metric according to replies to a questionnaire sent out to local authorities. The questionnaire asked how many dwellings the authorities expect to design in 1969 and whether they will be in imperial or metric dimensions.

So far, returns received by the NBA show that some 50 000 houses (26% of the total) will be designed in metric in 1969. Some 1 183 housing authorities (85% of the total) have so far replied of whom 295 (21%) expect to be working in metric this year.

Some 203 authorities have not yet returned their questionnaires. Of these, 33 who normally build over 100 dwellings a year could together be responsible for designing up to 5 000 dwellings in 1969 which represents about 2½% of the total number shown on the returns received so far.

In publishing these figures, the NBA points out that the estimate of the total number of dwellings to be designed in 1969 may be on the high side. Many authorities had to make estimates before forward housing programmes had been approved by their own housing committees or before the housing quotas granted by the Ministry were known. Schemes may be delayed by such factors as difficulties in acquiring sites.

The NBA is therefore carrying out a check to determine the accuracy of the returns from the questionnaire and to provide a breakdown by regions and contract dates.

Problems in hardware

Some of the problems architectural ironmongery manufacturers were faced with in changing to metric have been described by Dr. W. H. Hall, chairman of the Association of Builders' Hardware Manufacturers. He points out that because of its involvement with the metric programme, BSI have had to suspend work on revising existing British Standards for hardware. The ABHM technical committee is, however, continuing to draft performance standards in readiness for the time when BSI can restart this work.

The fact that there is still no internationally accepted standards for dimensions of locks and hardware, even among countries that have always been metric, is worrying and poses considerable problems in the UK metrication programme. The Association's policy so far has been to co-operate with the MHLG and such organisations as the British Woodwork Manufacturers' Association in the specification of fittings suitable for new metric doors and windows. When the main designs are finalised, the metric fittings will be produced to suit them, but it is anticipated that for many years the old imperial and new metric products will be manufactured simultaneously, in much the same way that the electrical industry still has to produce round pin plugs as well as 13 amp types. This will increase costs.

The related decimalisation programme also raises problems as to whether manufacturers in future pack in tens and hundreds. In fact, the dozen is widely used on the continent because it is such a convenient packing unit, and the International Association proposes to consider this situation at its next Congress. Meanwhile, manufacturers of locks, which traditionally differ in multiples of 12, are wondering how they can reorganise their production methods in metric terms. Clearly, a period of vast readjustment lies ahead.

Dr. Hall says that it is recognised that a lot of money must be spent on retooling in metric sizes He hopes it will not have to be spent twice as a consequence of trying to rationalise before the rest of Europe is ready to do so.

Additional door width

Commenting on the BSI Draft for Basic Spaces for Functional Group 2 (External Envelope), The British Woodwork Manufacturers' Association has recommended an additional width of 1 000 mm for non-housing purposes to accommodate a door width of 926 mm.

In a letter to the technical officer of BSI concerning external door sets, the director of BWMA, Peter B Allnatt, says that a wide range of applications appears to be provided for in the recommendations, with the consequence that there is some depth in the level of choice for basic sizes. He hoped that, at this stage, not all these sizes would be selected as standard door sets by the technical committee.

A further request is that the matrix should be based on the first and second levels of choice proposed, with one additional width of 1 000 mm. In the context of the scope covered by this matrix it is felt that the jump from 900 to 1 200 in width is too great, although only 900 will be produced by the manufacturers for housing purposes.

The letter continues: 'Assuming the least frame thickness one would use (32 mm back of frame to rebate), one arrives at a door width of 826 mm (2ft. 8½in.) in a 900 mm basic space, and in the 1 200 mm basic space the door width is 3ft. 8½in. There is a need we are sure for a door width of 926 mm (3ft.); this would necessitate the addition of a 1 000 mm basic width, and we think that this range should be extended throughout the height range of 2 100, 2 400, 2 700 and 3 000 mm.'

This enlarged range covers a wider range than required for housing so that the BWMA hope that it will meet a very large part of the requirements of all categories of building. As a result it will be made in large economic production runs. As assurance grows, it might be expected that a selection of this range will be put into stock by manufacturers. The less preferred sizes will be manufactured in shorter runs. On the other hand, the benefits of dimensional coordination, standardisation of the constituent parts of the components, and the simplification of ordering, delivery and identification procedures, should help to reduce the cost of this range.

Contractors' problems

Warning contractors of the problems that lay ahead in going metric, W. Nicol, recently elected president of the Scottish NFBTE, said at the federation's agm in Ayrshire in February: 'While it may be possible to recover some of the cost from the client it should be realised that much of the additional cost of the change to metric will have to be borne by contractors.'

New designs and components in metric sizes were now becoming available, but it was inevitable that there would be a time lag between the design stage and the tender stage for a project. This could mean that a contractor could find that components and materials were referred to in one measure or size in the contract documents but were not in fact available in that measure or size. It could be, said Mr. Nicol, that there would be cases where the building owner would refuse to meet the cost of variations like this on the grounds that the industry and the profession should have foreseen the consequences of the change to metric.

Letters

Metric in advertisements

Sir,—I have just analysed the numerous advertisements for building products in your issue of 21 February. Fifty advertisers gave dimensional details of their products. Of these, 44 quoted only imperial units. Five of the remaining six quoted imperial and metric units, one including an error which appeared to equate −40°C with −40°F! The remaining advertisement, for metric rules, showed tapes marked in numbered centimetre divisions—despite the use of only metres and millimetres in the SI metric system. Thus only 8% of these advertisers quoted fully correct metric dimensions, while 88% ignored metric units altogether. For an industry on the brink of a total change to metric this seems to display a sorry lack of either interest or understanding in the need for a fairly rapid 'conditioning' of everyone in the industry in metric units and notation.

ALAN E. FOWLER,
Group Personnel & Training Adviser,
Richard Costain Ltd.,
111 Westminster Bridge-road, SE1.

Key components

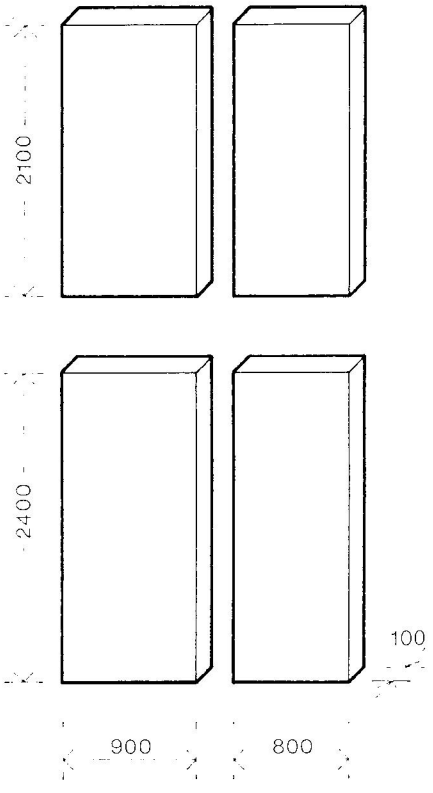
Partition panels

This is the 3rd of a series of data sheets prepared by The Modular Society under the editorship of Brian Jolly, ARIBA, to be published monthly in BMN.

The purpose of this third data sheet is to present the proposals of the Modular Society for the Key partition panels which should be included in any manufacturer's range of these components to justify their choice as Key Components and to demonstrate their use in current building practice. These proposals are put forward as a basis for discussion—see introductory article in 'Building,' 10 January 1969. Comments will be welcomed. The Society wish to thank correspondents who have already submitted their views on earlier data sheets.

Key partition panels

Solid walling units with both exposed faces either prepared for decoration or decorated.



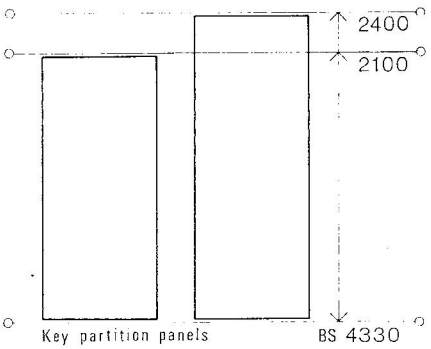
Partition panels form the bulk of the components used in partitioning systems since they form the solid element of the walling. Unlike doorsets and doorpanels, with which they require to be closely co-ordinated, they are essentially additive components. Two categories of partition panels are considered in this data sheet.

1. Those which span from floor to doorset head level.
2. Those which span from floor to ceiling.

Since it is the intention in these data sheets to highlight only those Key Components which are of particular significance in planning and which, when taken together, form the nucleus of a highly co-ordinated range of components, only a single panel thickness of 100 mm is advocated. This thickness is deemed suitable to accommodate a majority of the more common types of partitioning. It is not the society's intention, however, that all types of partition should conform to this single thickness.

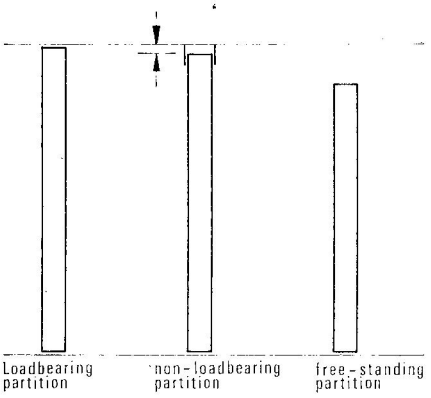
Heights

Both partition panel heights of 2 100 mm and 2 400 mm are BS 4011 first preference metric sizes, being simple multiples of 300 mm. They also conform to International recommendations since they are both simple multiples of the International basic module of 100 mm. The 2 400 mm partition panel height conforms with the lowest floor to ceiling controlling dimension recommendation of BS 4330 which is a multiple of the BS 4011 first preference increment of 300 mm. The 2 100 mm partition panel height conforms with the single BS 4330 doorhead level intermediate controlling dimension. Partition panels of this height will be required for use with doorsets for freestanding and clerestorey applications.



The partition panel heights are co-ordinated with the doorset and doorpanel heights of 2 100 mm and 2 400 mm—see first data sheet.

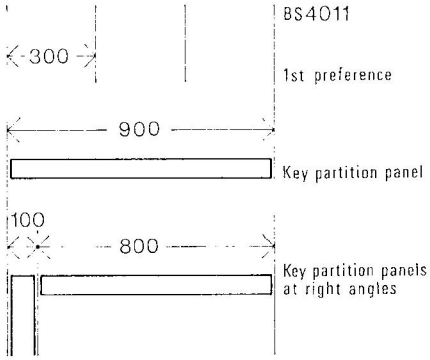
The manufacturing sizes of the partition panels are dependent on many factors. Where partition panels are to be erected between the finished floor and ceiling, particular attention should be paid to the space required for the erection of the panels. Where the partition is non-loadbearing, allowance should be made for the relative deflections of the floor and ceiling.



Widths

The two widths of the Key partition panels conform to BS 4011. The 900 mm width is a first preference metric size, being a simple multiple of 300 mm. The 800 mm width is a second preference size, being a multiple of 100 mm. The 900 mm width conforms directly to a planning grid increment of 300 mm—in accordance with BS 4330, Appendix B. The 800 mm width relates to this increment in combination with the partition thickness of 100 mm.

The Key partition panel widths are identical to the widths of the Key doorsets and doorpanels recommended in the first data sheet.



Thickness

The single thickness of 100 mm for all the Key partition panels is both a second preference size to BS 4011 and a recommended loadbearing wall zone width to BS 4330. It is also equal to the International basic module size. Since this thickness is equal to the difference between the two Key panel widths of 900 mm and 800 mm, a high degree of integration may be achieved at partition corners and intersections.

The Key partition panel thickness is identical to the thickness recommended in earlier sheets for the Key doorsets, doorpanels and blockwork partitioning.

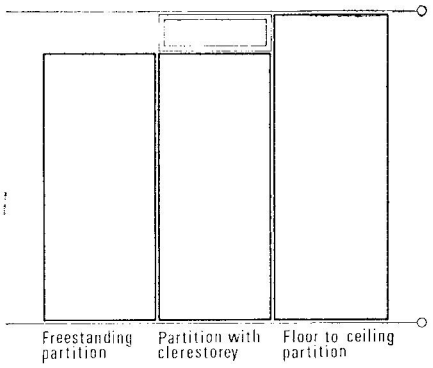
Weight

No limit is to be recommended for partition panels where cranage is a prerequisite. Where the panel is intended to be manhandlable, an upper limit of 150 kg may be considered to be a reasonable two-man load. This corresponds to a maximum overall partition density, regardless of its constructional form, of 750 kg/m^3 and a maximum floor loading of 167/kg/m partition run.

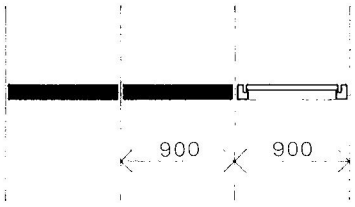
BUILDING METRICATION NEWS

Planning with key partition panels

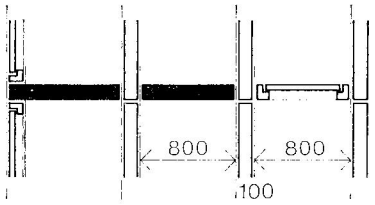
The two heights of partition panel may be used to form three types of partitioning: floor to ceiling partitioning (2 400 mm only), solid partitioning with clerestorey glazing or freestanding partitioning.



On plan the two sizes of partition panel are shown related, for convenience, to a 900 mm planning grid. The relationship between the partition panel sizes and the two doorset and doorpanel sizes is of fundamental importance.

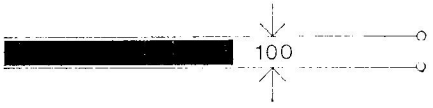


A straight run of 900 mm partition panels and 900 mm doorset.

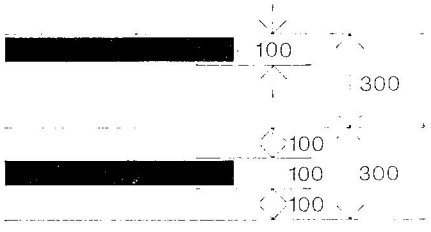


A partitioning layout illustrating the use of 800 mm panels.

Key partition panels are shown below related to the appropriate zone widths to BS 4330.



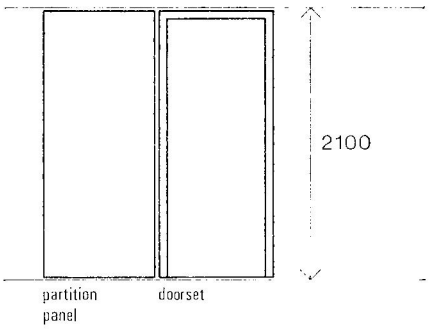
100 mm loadbearing partition panel in a 100 mm zone.

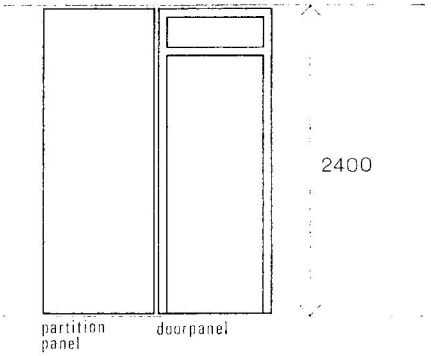


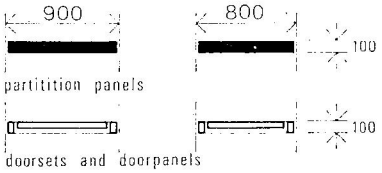
100 mm non-loadbearing partitions in a 300 mm grid space, shown centrally placed, and also placed with one face on a grid line.

Co-ordination with other key components

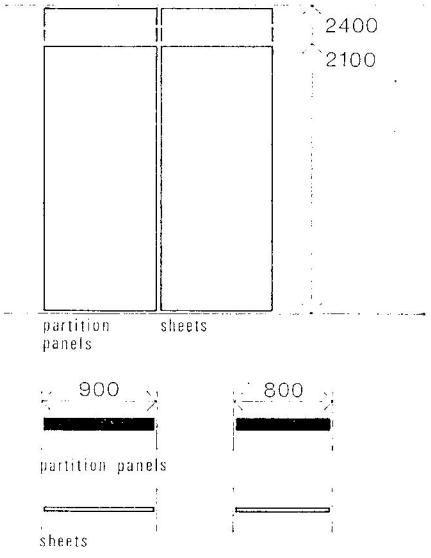
Internal doorsets and door panels



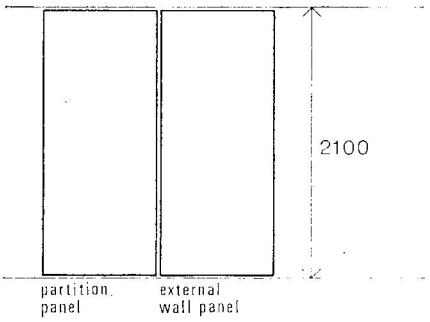


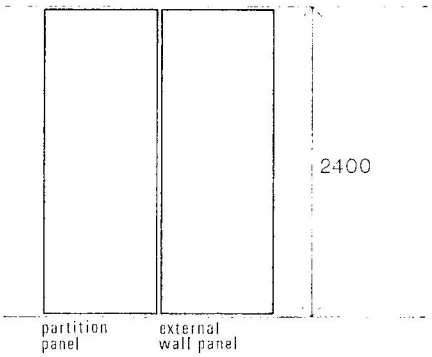


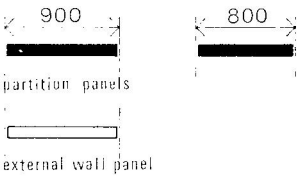
Sheets



External wall panels

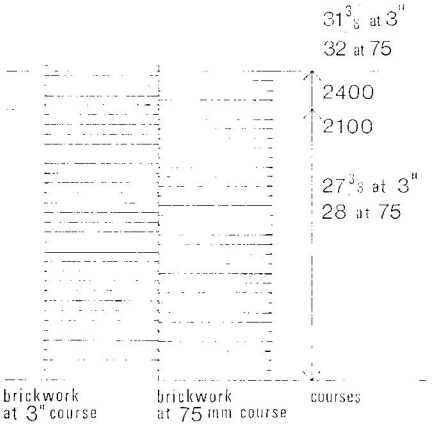




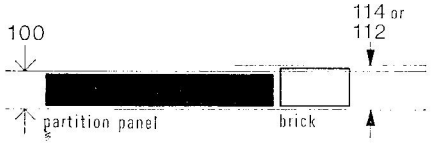


Co-ordination with imperial sized bricks

Partition panels will be required to abut dimensionally co-ordinated brickwork using the 3in. brick at four courses to 300 mm. Where Key partition panels may be used abutting existing brickwork, extra height floor or ceiling plates will be required.



Only one face of Key partitioning may be aligned with imperial brickwork.



Metrication the computer and SI

This series of conversion tables, compiled by R. M. E. Diamant and B. A. L. Hart, appears in this section periodically. They are to be used like logarithmic tables, using a ruler to ensure clear distinction of the horizontal lines. The tables have been set with the help of the English Electric KD9F computer at the University of Salford.

Table 9
Litres per second to gallons per minute
1 litre/second = 13.1978356 gallons/minute
Note: diff signifies single units so that the reading for any number required is taken at the intersection of the horizontal 10 unit line and the vertical single unit column.

diff	0	1	2	3	4	5	6	7	8	9
litre/second					gallon/minute					
0		13.2	26.4	39.6	52.8	66.0	79.2	92.4	105.6	118.8
10	132.0	145.2	158.4	171.6	184.8	198.0	211.2	224.4	237.6	250.8
20	264.0	277.2	290.4	303.6	316.7	329.9	343.1	356.3	369.5	382.7
30	395.9	409.1	422.3	435.5	448.7	461.9	475.1	488.3	501.5	514.7
40	527.9	541.1	554.3	567.5	580.7	593.9	607.1	620.3	633.5	646.7
50	659.9	673.1	686.3	699.5	712.7	725.9	739.1	752.3	765.5	778.7
60	791.9	805.1	818.3	831.5	844.7	857.9	871.1	884.3	897.5	910.7
70	923.8	937.0	950.2	963.4	976.6	989.8	1003.0	1016.2	1029.4	1042.6
80	1055.8	1069.0	1082.2	1095.4	1108.6	1121.8	1135.0	1148.2	1161.4	1174.6
90	1187.8	1201.0	1214.2	1227.4	1240.6	1253.8	1267.0	1280.2	1293.4	1306.6
100	1319.8	1333.0	1346.2	1359.4	1372.6	1385.8	1399.0	1412.2	1425.4	1438.6
110	1451.8	1465.0	1478.2	1491.4	1504.6	1517.8	1530.9	1544.1	1557.3	1570.5
120	1583.7	1596.9	1610.1	1623.3	1636.5	1649.7	1662.9	1676.1	1689.3	1702.5
130	1715.7	1728.9	1742.1	1755.3	1768.5	1781.7	1794.9	1808.1	1821.3	1834.5
140	1847.7	1860.9	1874.1	1887.3	1900.5	1913.7	1926.9	1940.1	1953.3	1966.5
150	1979.7	1992.9	2006.1	2019.3	2032.5	2045.7	2058.9	2072.1	2085.3	2098.5
160	2111.7	2124.9	2138.0	2151.2	2164.4	2177.6	2190.8	2204.0	2217.2	2230.4
170	2243.6	2256.8	2270.0	2283.2	2296.4	2309.6	2322.8	2336.0	2349.2	2362.4
180	2375.6	2388.8	2402.0	2415.2	2428.4	2441.6	2454.8	2468.0	2481.2	2494.4
190	2507.6	2520.8	2534.0	2547.2	2560.4	2573.6	2586.8	2600.0	2613.2	2626.4
200	2639.6	2652.8	2666.0	2679.2	2692.4	2705.6	2718.8	2732.0	2745.1	2758.3
210	2771.5	2784.7	2797.9	2811.1	2824.3	2837.5	2850.7	2863.9	2877.1	2890.3
220	2903.5	2916.7	2929.9	2943.1	2956.3	2969.5	2982.7	2995.9	3009.1	3022.3
230	3035.5	3048.7	3061.9	3075.1	3088.3	3101.5	3114.7	3127.9	3141.1	3154.3
240	3167.5	3180.7	3193.9	3207.1	3220.3	3233.5	3246.7	3259.9	3273.1	3286.3
250	3299.5	3312.7	3325.9	3339.1	3352.3	3365.4	3378.6	3391.8	3405.0	3418.2
260	3431.4	3444.6	3457.8	3471.0	3484.2	3497.4	3510.6	3523.8	3537.0	3550.2
270	3563.4	3576.6	3589.8	3603.0	3616.2	3629.4	3642.6	3655.8	3669.0	3682.2
280	3695.4	3708.6	3721.8	3735.0	3748.2	3761.4	3774.6	3787.8	3801.0	3814.2
290	3827.4	3840.6	3853.8	3867.0	3880.2	3893.4	3906.6	3919.8	3933.0	3946.2
300	3959.4	3972.5	3985.7	3998.9	4012.1	4025.3	4038.5	4051.7	4064.9	4078.1
310	4091.3	4104.5	4117.7	4130.9	4144.1	4157.3	4170.5	4183.7	4196.9	4210.1
320	4223.3	4236.5	4249.7	4262.9	4276.1	4289.3	4302.5	4315.7	4328.9	4342.1
330	4355.3	4368.5	4381.7	4394.9	4408.1	4421.3	4434.5	4447.7	4460.9	4474.1
340	4487.3	4500.5	4513.7	4526.9	4540.1	4553.3	4566.5	4579.6	4592.8	4606.0
350	4619.2	4632.4	4645.6	4658.8	4672.0	4685.2	4698.4	4711.6	4724.8	4738.0
360	4751.2	4764.4	4777.6	4790.8	4804.0	4817.2	4830.4	4843.6	4856.8	4870.0
370	4883.2	4896.4	4909.6	4922.8	4936.0	4949.2	4962.4	4975.6	4988.8	5002.0
380	5015.2	5028.4	5041.6	5054.8	5068.0	5081.2	5094.4	5107.6	5120.8	5134.0
390	5147.2	5160.4	5173.6	5186.7	5199.9	5213.1	5226.3	5239.5	5252.7	5265.9
400	5279.1	5292.3	5305.5	5318.7	5331.9	5345.1	5358.3	5371.5	5384.7	5397.9
410	5411.1	5424.3	5437.5	5450.7	5463.9	5477.1	5490.3	5503.5	5516.7	5529.9
420	5543.1	5556.3	5569.5	5582.7	5595.9	5609.1	5622.3	5635.5	5648.7	5661.9
430	5675.1	5688.3	5701.5	5714.7	5727.9	5741.1	5754.3	5767.5	5780.7	5793.8
440	5807.0	5820.2	5833.4	5846.6	5859.8	5873.0	5886.2	5899.4	5912.6	5925.8
450	5939.0	5952.2	5965.4	5978.6	5991.8	6005.0	6018.2	6031.4	6044.6	6057.8
460	6071.0	6084.2	6097.4	6110.6	6123.8	6137.0	6150.2	6163.4	6176.6	6189.8
470	6203.0	6216.2	6229.4	6242.6	6255.8	6269.0	6282.2	6295.4	6308.6	6321.8
480	6335.0	6348.2	6361.4	6374.6	6387.8	6401.0	6414.1	6427.3	6440.5	6453.7
490	6466.9	6480.1	6493.3	6506.5	6519.7	6532.9	6546.1	6559.3	6572.5	6585.7
500	6598.9	6612.1	6625.3	6638.5	6651.7	6664.9	6678.1	6691.3	6704.5	6717.7

Table 9. Litres per second to gallons per minute. This table is to be used for the flow rate through pipes, troughs and other flow channels.

(continued on page 159)

Metrication the computer and SI

Table 10
Square metres per litre to square yards per gallon
$1 m^2/litre = 5.4369731$ sq.yds./gallon.
Note: diff signifies single units so that the reading for any number required is taken at the intersection of the horizontal 10 unit line and the vertical single unit column.

diff	0	1	2	3	4	5	6	7	8	9
m^2/litre					yd^2/ gallon					
0		5.4	10.9	16.3	21.7	27.2	32.6	38.1	43.5	48.9
10	54.4	59.8	65.2	70.7	76.1	81.6	87.0	92.4	97.9	103.3
20	108.7	114.2	119.6	125.1	130.5	135.9	141.4	146.8	152.2	157.7
30	163.1	168.5	174.0	179.4	184.9	190.3	195.7	201.2	206.6	212.0
40	217.5	222.9	228.4	233.8	239.2	244.7	250.1	255.5	261.0	266.4
50	271.8	277.3	282.7	288.2	293.6	299.0	304.5	309.9	315.3	320.8
60	326.2	331.7	337.1	342.5	348.0	353.4	358.8	364.3	369.7	375.2
70	380.6	386.0	391.5	396.9	402.3	407.8	413.2	418.6	424.1	429.5
80	435.0	440.4	445.8	451.3	456.7	462.1	467.6	473.0	478.5	483.9
90	489.3	494.8	500.2	505.6	511.1	516.5	521.9	527.4	532.8	538.3
100	543.7	549.1	554.6	560.0	565.4	570.9	576.3	581.8	587.2	592.6
110	598.1	603.5	608.9	614.4	619.8	625.3	630.7	636.1	641.6	64.0
120	652.4	657.9	663.3	668.7	674.2	679.6	685.1	690.5	695.9	701.4
130	706.8	712.2	717.7	723.1	728.6	734.0	739.4	744.9	750.3	755.7
140	761.2	766.6	772.1	777.5	782.9	788.4	793.8	799.2	804.7	810.1
150	815.5	821.0	826.4	831.9	837.3	842.7	848.2	853.6	859.0	864.5
160	869.9	875.4	880.8	886.2	891.7	897.1	902.5	908.0	913.4	918.8
170	924.3	929.7	935.2	940.6	946.0	951.5	956.9	962.3	967.8	973.2
180	978.7	984.1	989.5	995.0	1000.4	1005.8	1011.3	1016.7	1022.2	1027.6
190	1033.0	1038.5	1043.9	1049.3	1054.8	1060.2	1065.6	1071.1	1076.5	1082.0
200	1087.4	1092.8	1098.3	1103.7	1109.1	1114.6	1120.0	1125.5	1130.9	1136.3
210	1141.8	1147.2	1152.6	1158.1	1163.5	1168.9	1174.4	1179.8	1185.3	1190.7
220	1196.1	1201.6	1207.0	1212.4	1217.9	1223.3	1228.8	1234.2	1239.6	1245.1
230	1250.5	1255.9	1261.4	1266.8	1272.3	1277.7	1283.1	1288.6	1294.0	1299.4
240	1304.9	1310.3	1315.7	1321.2	1326.6	1332.1	1337.5	1342.9	1348.4	1353.8
250	1359.2	1364.7	1370.1	1375.6	1381.0	1386.4	1391.9	1397.3	1402.7	1408.2
260	1413.6	1419.0	1424.5	1429.9	1435.4	1440.8	1446.2	1451.7	1457.1	1462.5
270	1468.0	1473.4	1478.9	1484.3	1489.7	1495.2	1500.6	1506.0	1511.5	1516.9
280	1522.4	1527.8	1533.2	1538.7	1544.1	1549.5	1555.0	1560.4	1565.8	1571.3
290	1576.7	1582.2	1587.6	1593.0	1598.5	1603.9	1609.3	1614.8	1620.2	1625.7
300	1631.1	1636.5	1642.0	1647.4	1652.8	1658.3	1663.7	1669.2	1674.6	1680.0
310	1685.5	1690.9	1696.3	1701.8	1707.2	1712.6	1718.1	1723.5	1729.0	1734.4
320	1739.8	1745.3	1750.7	1756.1	1761.6	1767.0	1772.5	1777.9	1783.3	1788.8
330	1794.2	1799.6	1805.1	1810.5	1815.9	1821.4	1826.8	1832.3	1837.7	1843.1
340	1848.6	1854.0	1859.4	1864.9	1870.3	1875.8	1881.2	1886.6	1892.1	1897.5
350	1902.9	1908.4	1913.8	1919.3	1924.7	1930.1	1935.6	1941.0	1946.4	1951.9
360	1957.3	1962.7	1968.2	1973.6	1979.1	1984.5	1989.9	1995.4	2000.8	2006.2
370	2011.7	2017.1	2022.6	2028.0	2033.4	2038.9	2044.3	2049.7	2055.2	2060.6
380	2066.0	2071.5	2076.9	2082.4	2087.8	2093.2	2098.7	2104.1	2109.5	2115.0
390	2120.4	2125.9	2131.3	2136.7	2142.2	2147.6	2153.0	2158.5	2163.9	2169.4
400	2174.8	2180.2	2185.7	2191.1	2196.5	2202.0	2207.4	2212.8	2218.3	2223.7
410	2229.2	2234.6	2240.0	2245.5	2250.9	2256.3	2261.8	2267.2	2272.7	2278.1
420	2283.5	2289.0	2294.4	2299.8	2305.3	2310.7	2316.2	2321.6	2327.0	2332.5
430	2337.9	2343.3	2348.8	2354.2	2359.6	2365.1	2370.5	2376.0	2381.4	2386.8
440	2392.3	2397.7	2403.1	2408.6	2414.0	2419.5	2424.9	2430.3	2435.8	2441.2
450	2446.6	2452.1	2457.5	2462.9	2468.4	2473.8	2479.3	2484.7	2490.1	2495.6
460	2501.0	2506.4	2511.9	2517.3	2522.8	2528.2	2533.6	2539.1	2544.5	2549.9
470	2555.4	2560.8	2566.3	2571.7	2577.1	2582.6	2588.0	2593.4	2598.9	2604.3
480	2609.7	2615.2	2620.6	2626.1	2631.5	2636.9	2642.4	2647.8	2653.2	2658.7
490	2664.1	2669.6	2675.0	2680.4	2685.9	2691.3	2696.7	2702.2	2707.6	2713.0
500	2718.5	2723.9	2729.4	2734.8	2740.2	2745.7	2751.1	2756.5	2762.0	2767.4

Table 10. Square metres per litre to square yards per gallon.
This table is to be used for calculating the rate of coverage for paint, distemper and similar materials.

Metrication the computer and SI

(continued from page 156)

Table 11
Cubic metres per square metre to gallons per square yard
1 m^3/m^2 = 183.8235294 gallon/yd^2

Note: diff signifies single parts of a unit so that the reading for any member required is taken at the intersection of the appropriate horizontal one-hundredth unit line and the vertical one-thousandth unit columns

diff	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
m^3/m^2	gallon/yd^3									
0.00		0.184	0.368	0.551	0.735	0.919	1.103	1.287	1.471	1.654
0.01	1.838	2.022	2.206	2.390	2.574	2.757	2.941	3.125	3.309	3.493
0.02	3.676	3.860	4.044	4.228	4.412	4.596	4.779	4.963	5.147	5.331
0.03	5.515	5.699	5.882	6.066	6.250	6.434	6.618	6.801	6.985	7.169
0.04	7.353	7.537	7.721	7.904	8.088	8.272	8.456	8.640	8.824	9.007
0.05	9.191	9.375	9.559	9.743	9.926	10.110	10.294	10.478	10.662	10.846
0.06	11.029	11.213	11.397	11.581	11.765	11.949	12.132	12.316	12.500	12.684
0.07	12.868	13.051	13.235	13.419	13.603	13.787	13.971	14.154	14.338	14.522
0.08	14.706	14.890	15.074	15.257	15.441	15.625	15.809	15.993	16.176	16.360
0.09	16.544	16.728	16.912	17.096	17.279	17.463	17.647	17.831	18.015	18.199
0.10	18.382	18.566	18.750	18.934	19.118	19.301	19.485	19.669	19.853	20.037
0.11	20.221	20.404	20.588	20.772	20.956	21.140	21.324	21.507	21.691	21.875
0.12	22.059	22.243	22.426	22.610	22.794	22.978	23.162	23.346	23.529	23.713
0.13	23.897	24.081	24.265	24.449	24.632	24.816	25.000	25.184	25.368	25.551
0.14	25.735	25.919	26.103	26.287	26.471	26.654	26.838	27.022	27.206	27.390
0.15	27.574	27.757	27.941	28.125	28.309	28.493	28.676	28.860	29.044	29.228
0.16	29.412	29.596	29.779	29.963	30.147	30.331	30.515	30.699	30.882	31.066
0.17	31.250	31.434	31.618	31.801	31.985	32.169	32.353	32.537	32.721	32.904
0.18	33.088	33.272	33.456	33.640	33.824	34.007	34.191	34.375	34.559	34.743
0.19	34.926	35.110	35.294	35.478	35.662	35.846	36.029	36.213	36.397	36.581
0.20	36.765	36.949	37.132	37.316	37.500	37.684	37.868	38.051	38.235	38.419
0.21	38.603	38.787	38.971	39.154	39.338	39.522	39.706	39.890	40.074	40.257
0.22	40.441	40.625	40.809	40.993	41.176	41.360	41.544	41.728	41.912	42.096
0.23	42.279	42.463	42.647	42.831	43.015	43.199	43.382	43.566	43.750	43.934
0.24	44.118	44.301	44.485	44.669	44.853	45.037	45.221	45.404	45.588	45.772
0.25	45.956	46.140	46.324	46.507	46.691	46.875	47.059	47.243	47.426	47.610
0.26	47.794	47.978	48.162	48.346	48.529	48.713	48.897	49.081	49.265	49.449
0.27	49.632	49.816	50.000	50.184	50.368	50.551	50.735	50.919	51.103	51.287
0.28	51.471	51.654	51.838	52.022	52.206	52.390	52.574	52.757	52.941	53.125
0.29	53.309	53.493	53.676	53.860	54.044	54.228	54.412	54.596	54.779	54.963
0.30	55.147	55.331	55.515	55.699	55.882	56.066	56.250	56.434	56.618	56.801
0.31	56.985	57.169	57.353	57.537	57.721	57.904	58.088	58.272	58.456	58.640
0.32	58.824	59.007	59.191	59.375	59.559	59.743	59.926	60.110	60.294	60.478
0.33	60.662	60.846	61.029	61.213	61.397	61.581	61.765	61.949	62.132	62.316
0.34	62.500	62.684	62.868	63.051	63.235	63.419	63.603	63.787	63.971	64.154
0.35	64.338	64.522	64.706	64.890	65.074	65.257	65.441	65.625	65.809	65.993
0.36	66.176	66.360	66.544	66.728	66.912	67.096	67.279	67.463	67.647	67.831
0.37	68.015	68.199	68.382	68.566	68.750	68.934	69.118	69.301	69.485	69.669
0.38	69.853	70.037	70.221	70.404	70.588	70.772	70.956	71.140	71.324	71.507
0.39	71.691	71.875	72.059	72.243	72.426	72.610	72.794	72.978	73.162	73.346
0.40	73.529	73.713	73.897	74.081	74.265	74.449	74.632	74.816	75.000	75.184
0.41	75.368	75.551	75.735	75.919	76.103	76.287	76.471	76.654	76.838	77.022
0.42	77.206	77.390	77.574	77.757	77.941	78.125	78.309	78.493	78.676	78.860
0.43	79.044	79.228	79.412	79.596	79.779	79.963	80.147	80.331	80.515	80.699
0.44	80.882	81.066	81.250	81.434	81.618	81.801	81.985	82.169	82.353	82.537
0.45	82.721	82.904	83.088	83.272	83.456	83.640	83.824	84.007	84.191	84.375
0.46	84.559	84.743	84.926	85.110	85.294	85.478	85.662	85.846	86.029	86.213
0.47	86.397	86.581	86.765	86.949	87.132	87.316	87.500	87.684	87.868	88.051
0.48	88.235	88.419	88.603	88.787	88.971	89.154	89.338	89.522	89.706	89.890
0.49	90.074	90.257	90.441	90.625	90.809	90.993	91.176	91.360	91.544	91.728
0.50	91.912	92.096	92.279	92.463	92.647	92.831	93.015	93.199	93.382	93.566

Correction: The Imperial heading opposite should read gallon/yd^3

Table 11, cubic metres per square metre to gallons per square yard. This table is to be used for calculation of concrete/area, surface finishes and other cases where hydraulic load has to be calculated.

Publications

BUILDING QUANTITIES EXPLAINED. ALTERNATIVE EDITION IN SI UNITS. By Ivor H. Seeley. London: Macmillan & Co. Ltd. Price 45s.

The 1968 metric edition of the Standard Method of Measurement makes existing guides out of date. This new edition of Ivor Seeley's book, compiled in SI units, is intended to fill the gap. In addition the text has been carefully revised and brought up-to-date, the chapter on bill preparation processes has been enlarged and a new chapter has been added on the topic of the measurement of small buildings. The manual aims at clarifying the basic principles contained in the Standard Method and shows with worked examples facsimile dimension sheets and drawings how they should be applied. The book takes into account the latest techniques in quantity surveying, including the use of computors. It shows the effect of metrication on measuring building work and how measurements are made in metric terms. In line with BSI recommendations equivalent imperial values have not been included in the examples but for initial familiarisation a metric conversion table is included in the appendix.

ELEMENTS OF QUANTITY SURVEYING, SIXTH EDITION (METRIC) by Arthur J. Willis, FRICS and Christopher J. Willis, FRICS. London: Crosby Lockwood & Son Ltd. Price 35s.

The metric edition of the well-known textbook for the Intermediate and Final (Part I) examination of the RICS. Whilst imperial measures have been converted to metric, it is recognised that the use of imperial units in the description of individual items cannot be precluded, at least until British Standards in metric are available for all principal materials. Accordingly, such units have been retained where necessary, e.g. pipes are described as ½in. and billed in metres.

Although in the main this edition is a conversion of the fifth edition from imperial measures to metric, the opportunity has been taken to drop from the examples some construction and descriptions which have fallen out of use (the abbreviation 'c.a.' for cart away, although useful, is hardly apposite some 50 years after the horse and cart has disappeared from the building scene) and to adapt more modern practice.

SPECIFICATION WRITING FOR ARCHITECTS AND SURVEYORS. FIFTH EDITION (METRIC) by Arthur J. Willis and Christopher J. Willis London: Crosby Lockwood & Sons Ltd. Price 20s.

It is felt that specifications will be required in both imperial as well as metric terms for some time yet and of the alternatives facing the authors—complete metric, complete imperial or a compromise between the two—they have chosen the last course. Except for the example specification and drawing, the dimensions are left in imperial terms, but wherever practicable and where some indication is given of availability of metric materials, sensible metric equivalents have been included in brackets. The example specification has been rewritten as a metric document, but leaving certain items, for which no metric equivalents were available at the time of writing, in imperial terms. The drawing is fully metricated.

Coming events

Courses on metrication

Courses on metrication and dimensional co-ordination for members of the professions in the construction industry are to be held at three university schools of architecture—Liverpool, Newcastle upon Tyne and the Heriot-Watt University, Edinburgh. The course, which has been developed by the Education Group of the Directorate of Building Management, MPBW, is an improved version of courses already presented at Bristol University and the Regent Street Polytechnic last year.

The courses will each be of four days' duration and are intended for all the professions in the construction industry. An important part of the courses is four exercises, one of which is based upon the construction of the Crown Office now being designed in metric dimensionally co-ordinated terms by Ministry staff.

The subjects covered will be: General principles of metrication; the broad economics of metrication; general principles of dimensional co-ordination (+ exercise); British Standards and Codes of Practice; metrication and the structural engineer (+ exercise); heat, light and sound (+ exercise); metrication and the Building Regulations; implications of metrication for the the manufacturer; and metric measurement in practice (+ exercise).

The course will be held at the following places:

School of Architecture, Liverpool University, Abercromby-square, Liverpool 7, from Thursday, 27 March, to Sunday, 30 March; School of Architecture, University of Newcastle, Newcastle upon Tyne, from Thursday, 3 July, to Sunday, 6 July; and Department of Architecture, Heriot-Watt University, Edinburgh, from Thursday, 17 July, to Sunday, 20 July.

It is hoped to mount a fourth course in May or June.

Those wishing for further details of the courses should apply direct to the School of Architecture in the University concerned.

WEDNESDAY, 19 MARCH

Trend 69: a conference on metrication in the building industry chaired by Peter Cocke, chairman of the RIBA Metric Advisory Group and arranged by Dibben Builders' Merchants Ltd. Held at the company's headquarters at Antelope House, Bursledon-road, Thornhill, Southampton, at 5.30. Applications for tickets (10s.) should be made to the Conference Secretary, c/o Dibben Builders' Merchants.

MONDAY, 31 MARCH

Metrication and modular co-ordination: a three-day mid-career course for architects in preparation for the change to metric and an introduction to modular co-ordination will be held in the School of Architecture, Department of Environmental Design, Manchester College of Art and Design, All Saints, Manchester 15. (31 March-2 April).

The fee for the course, which is non-residential, is £12. Accommodation is limited and those wishing to attend the course should make application by 28 February to the Secretary, School of Architecture, at the above address.

WEDNESDAY, 2 APRIL

The change to metric—the practical effects on the construction industry—a one-day symposium organised by the North West Branch of the Concrete Society and held in Manchester. The aim of the symposium will be for the speakers, who represent different specialist fields in the construction industry, to give an account of their practical experience of problems which they have encountered and how they have been overcome.

Chairman will be S. S. Heighway of Ove Arup & Partners. Among the contributors are G. H. Wigglesworth, Director of Building Development, MPBW; J. Rendell, Technical Officer in charge of Structural Codes of Practice at the BSI; J. L. Bannister, Senior Lecturer, Department of Civil and Structural Engineering, University College, Cardiff; J. Lawson, Assistant Chief Designer of Liner Concrete Machinery Company; Alan Diprose, Consultant on Dimensional Co-ordination for industrialised building and components; A. B. Thomson, of Davis Belfield & Everest; R Whittle, Development Engineer, Ove Arup & Partners; and B. Chasterton, Chief Engineer of Gilbert-Ash Structures Ltd. Ample time will be allowed for discussion and for contributions which illustrate the practical problems of metrication and the costs involved. The fee for the symposium is £3 for Concrete Society members and £4 for non-members. Applications for tickets should be made before 24 March, to H. Bagshaw, c/o GKN Reinforcements Ltd., Woodhouse-lane, Wigan, Lancashire.

FRIDAY, 18 APRIL

Change to metric: one-day symposium on the change as it affects the construction industry. Arranged by IAAS Manchester & District Branch; Manchester University.

TUESDAY, 22 APRIL
THURSDAY, 1 MAY

Training for metrication in the design office—seminar at the Great Northern Hotel, Kings Cross, London, N1. Organised by Northwood Metric Services Ltd., 258 Gray's Inn-road, London, WC1.

THURSDAY, 1 MAY

Going metric: a study conference for senior management. Topics include the rôle and scope of the Metrication Board, decisions to be taken by management, designing in the metric system and staff training and retraining. Conference is held at the Piccadilly Hotel, London, W1, starting 9.15 am. Fee—20 guineas. Enquiries should be addressed to the Administrator, Management Studies Centre, 14 Queen Victoria-street, London, EC4.

Metric conferences

Northwood Metric Services Ltd., compilers of the Metripack system of learning metric, have arranged the following conferences in co-operation with the British Institute of Management under the title 'Managing metrication in the construction and associated industries':

Thursday, 27 March, London
Wednesday, 16 April, Chester
Tuesday, 17 June, London
Wednesday, 24 September, Harrogate.