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*The Editor will be glad to receive MS. articles and also illustrations of current architecture in this country and abroad with a view to publication. Though every care will be taken, the Editor cannot hold himself responsible for material sent him.*

THURSDAY, SEPTEMBER 19, 1940. NUMBER 2383 : VOLUME 92

## PRINCIPAL CONTENTS



[*The photograph on page 242 is reproduced from the August issue of "Pencil Points."*]

*Owing to the paper shortage the* JOURNAL, *in common with all other papers, is now only supplied to newsagents on a "firm order" basis. This means that newsagents are now unable to supply the* JOURNAL *except to a client's definite order.*

*To obtain your copy of the* JOURNAL *you must therefore either place a definite order with your newsagent or send a subscription order to the Publishers.*

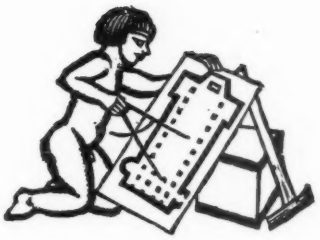
# H.M. FORCES INFORMATION OFFICE, S.W.

*ARCHITECTS: MESSRS. JOSEPH*


*The H.M. Forces Information Office, Trafalgar Square, W.C.2, to be officially opened tomorrow has been erected for the Welfare Branch, Eastern and London Command, from the designs of Messrs. Joseph. The purpose of this building is to serve as an information office in a central position for the use of H.M. Forces by day and night. The main walls are of 9 in. brickwork, fair face internally; pointing, raked joint externally; flush joint internally; coping, concrete tile; windows, steel casements. The panel wall which marks the limit of the main inquiry office is of glass brick construction, the brickwork over being carried by a R.S.J. supported by 3 in. tubular steel columns. The projecting hood is constructed of T-sections cleated to the underside of the beam at 18 in. centres, the intervening spaces being filled with expanded metal lathing and rendered.*

## FACTORY IN U.S.A.

*Factory for a chemical company in Cambridge, Massachusetts. Architects: Coolidge, Shepley, Bullfinch and Abbott.*



# A WAR OF BOMBS?

IN his latest broadcast the Prime Minister stated that the London air raids are intended to be the first stage of attempted invasion.

Whether the second stage will take place is doubtful. But it is obvious that the enemy hopes, by continuous bombing of the London area, to create a situation which will decrease our powers of resistance to invasion.

The first requirement of the present situation is, therefore, that nothing which London's inhabitants suffer should be allowed to decrease our power of resistance to invasion—at least for the next few weeks.

This is a hard decision in some ways. The areas which have been most damaged and those in which the largest number of people have had to be temporarily moved, are, as always, the most crowded and most vulnerable areas. It is tempting to think of huge schemes by which the hardships of the inhabitants of these areas could be removed or protected—and, of course, even more tempting to think that the Government should have carried out such schemes before. But until the threat of invasion has grown less, it would be suicidal to put into operation any scheme which involves any large diversion of labour and materials, which imposes any large burden on transport, communications, or the local authorities and inhabitants of areas which present more difficult targets to indiscriminate night bombing.

London's hardships must at present be relieved on the spot by voluntary labour, by cash grants, ingenuity and makeshift; and no one who has seen the local authorities at work can doubt that they are doing all they can. Unavoidable hardships—of which the greatest is the lack of shelters in which families can sleep—must continue to be borne where makeshift fails.

This must be the policy for the next four or eight weeks. But if invasion is not attempted until winter conditions greatly reduces its likelihood, the situation will be very different. Blow and counter blow by aerial bombardment may then become the paramount part of the conflict, and surpassing the enemy in the efficiency of our Civil Defence may become the essential preliminary to victory.

There can be no doubt that if the war enters such a phase, Civil Defence organization will have to be extended and enlarged, and labour and materials and brains diverted for the purpose. They cannot be diverted at present, but there is no reason why plans for their use when they can be diverted should not be drawn up now. We have been well ahead of Germany in Civil Defence so far. We should make sure that we keep ahead. The raids on the London area have shown that it is for the larger problems of Civil Defence that new solutions will be needed if aerial bombardment becomes the main method of conflict. The "injury" services of Civil Defence in all branches have been proved able to deal with demands far exceeding those which have yet been imposed on them. First aid to people, communications or services and the after-care of injured people are likely to raise no difficulties which cannot be solved by simple addition. It is the more complex problems of shelters, the after-care of those whose homes or workplaces have been damaged, evacuation and repairs to or replacement of buildings which demand the most skilful and determined examination.

There seems no doubt, for instance, that a supplementary Civil Defence organization will have to be set up to deal with closely-populated areas. For these areas not only contain the people and much of the plant which are necessary for the continued operation of the social mechanism, but they are also the most vulnerable and the least able to help themselves.

It seems probable that Civil Defence must extend additional help to these areas in two forms. The first is the provision of sleeping shelters—a task which will involve the skilled survey of each area, great ingenuity, and a considerable programme of building, even if coupled with an evacuation scheme. But it is a work that must be done if night raids are to continue during a long war. The second form of assistance must be the fuller organization of care for those whose houses are destroyed or damaged. Preparations for such after-care are in part simple; stores of clothing and food, canteens and grants in aid can be provided beforehand.

But rehousing for the duration of the war is much more difficult in areas where the possibilities of billeting are very small. Such rehousing may have to be in the form of communal living, in units such as that which won the R.I.B.A. Competition, for those whose work requires them to remain and evacuation for the rest. The best method can only be found by a careful comparison of the factors affecting each area with the probable rate of damage.

What is certain is that very skilful consideration of the psychological and social factors involved is needed now, to be followed by vigorous action if this war is to be a war of bombs. And in four weeks we ought to know whether—for six months—it is to be a war of bombs.

*The Architects' Journal*
*45 The Avenue, Cheam, Surrey*
*Telephone: Vigilant 0087-9.*

# NOTES & TOPICS

## LONDON IN THE HEADLINES

AN Irish landowner, who had remained on his estate equably enough through the Troubles, used to like to tell how one day during those stormy times he went to Dublin and called at his club to read the papers. " . . . And 'pon my soul," he used to go on, " when I had read in the English papers of the reign of terror throughout Ireland, I was too frightened to go home for three days and more."

*

The last week in London has recalled this story to me many times. Continuous air raids on London must be admitted to possess a very special degree of news-interest, but when I went away to the country for two days and read the local paper I found that much courage, cheerfulness and resolution was needed when it was time for the return journey. Once back, the worst was over, unless one was very unlucky indeed.

*

I was unlucky for one night and can state with authority that the normal " Whee-e-e-e . . . BANG ! " kind aren't nearly as bad as the fluttering-of-a-tin-tray-for-five-seconds-and-then-no-bang kind. Worst of all, in my view, is just one huge bang without any previous warning at all. I happened to be having a drink at that moment and found it very trying.

*

The great advantage of having stood fire at this range (about 200 yards) is the opportunity it gives of talking down to those who can't do better and of faintly suggesting that those who can are famous for their stories.

*

Otherwise, as so many people have said, it is wonderful what one can get used to, and it is the little things that annoy. Going to bed rather early, accompanied by noises, is no hardship : but a warning at breakfast time and a bus route which suddenly dries up at the source are very annoying. There's nothing more hateful than breakfasting with ears cocked. Flopping lightly onto one's chest in the Euston Road is far less disturbing.

*

Sound-proofness before Safety seems to be becoming the general answer to Question No. 1 of the moment—Where shall we sleep? Where there is reasonable protection I believe this to be the right answer. (1) Under the stairs in a Bloomsbury house, (2) A very strong shelter in a Hampstead garden, and (3) A small basement boiler chamber under a Hampstead house, shows that sinister sounds heard in (1) and (2) were quite inaudible in (3). It would therefore seem wise for all those who live in urban areas to do what they can to prepare for soundproof sleeping before the nights grow longer.

## LEARNING ABOUT EACH OTHER

In pre-war days the rigidity and narrowness of outlook of social groups were commonly considered the stiffest barrier to progress.

*

On political platforms this rigidity was often called class distinction and the narrowness class antagonism. Off platforms, both were more truthfully considered the results of a dislike of change which was common to all social groups and most individuals. The majority of social groups resisted any change in their habits or surroundings or relations with others unless it promised them immediate profit. They were not interested in long-term possibilities and had no curiosity about life in other places or other towns. In short, when the young reformer, in those days of telephones and motor cars, saw grocers petitioning against grant-aided housing in their suburb or twenty town councils in the same distressed twenty square miles fighting to the end against a joint solution of their common problems, he can be pardoned for having thought that a thorough knocking of heads together among all social and geographical groups would do a power of good.

*

We have now had twelve months of head knocking, and it is interesting to speculate on how much broadness of mind we have absorbed in the process—to our post-war benefit. The clatter of heads which began in September around the bigger cities now throbs through the land. The return of the B.E.F., the increasing call-up, the danger of invasion, the Blitz on London, must have increased the number living in strange houses or strange places to several millions. Never have Britons had such an opportunity to see how and where Britons live. What will be the result?

*

It would be unwise not to expect a reaction for a year or two after such unwilling musical chairs. Reaction is bound to take place. In the first post-war months even the enlightened will not want to look beyond individual and local affairs. But it is almost certain that this phase will not last. Circumstances will end it. Post-war problems will be far beyond control by Local-Council-plus-Government-grant methods. They will need something much bigger.

*

And the Local Council outlook will be doubly doomed. In wartime the public will have become accustomed to Regional Commissioners, Regional Military Commands, Regional A.R.P., and by the end of war regionalism may be disliked but the word will have been robbed of its terrors. If regional organization works well in wartime, it may become generally realized that it is necessary in peace:

that fire, police, educational, medical and other public services will give better results for less money when administered regionally; that the days of the *Borough of Goresby* v. *the World* outlook are numbered. If that happens the knocking of heads will not have been wasted.

FIRE SERVICE RAMPANT

Last Friday I received the following letter from my architect correspondent in the A.F.S. :—

*

I believe I once promised you a word-picture of how architectural skill and resource helps to put out a fire. This was some time ago. For months the big trouble was that there was no fire, or at any rate none that I ever got near. The trouble now is —which fire?

*

There is also another difficulty which somehow I did not think of beforehand. When one is at a fire in a subordinate and active capacity there is a minimum of opportunity to savour the scene as a whole, to admire the fire-resisting qualities of certain structures, deprecate the flimsiness of others and generally indulge in the clean-handed and elevated detachment which is typical of any architect near a well-known work of architecture. Indeed, no. The architect steps down from a peacetime pedestal very noticeably.

*

In my experience his usual attitude at a fire is a stooping one in a foot of lukewarm water. A gallon of the same is up each sleeve *en route* to his boots via his armpits. Endlessly he grapples with slimy, horribly heavy and wondrously interwoven lengths of hose. At half-hour intervals a passing pump runs over his foot, and all he knows of nearly all fires is heat on the back of his neck and a bad tickle in the throat. He has no desire to know any more.

*

In such surroundings professional skill does not give all the guidance which had been expected of it. One might suppose that an architect could guess when a wall was going to collapse: but in my view, a Senior Fireman who sucks his teeth piercingly and dates political events by their proximity to famous fires, can guess it very much better. And there is no one who spreads cheery confidence more quickly at a fire than he who always guesses right.

*

These seem to exhaust the architectural news-interest of fire-fighting at the moment, but two other points are worth attention by those architects who are also Londoners.

*

A very small fire at night can give a very big glow. And those who suffered on the night of Saturday, September 7, by being told that London was in flames can bear in mind that, up to the present, the London fire service has called out no reserves, leave —which deprives the service of more than a third of its full-time members—is still in force, and it has been arranged that if a man is up two nights running he has the third night in bed. This does not indicate that many fires are out of control.

*

The other point is that firemen's work is spectacular and very important, but it should be remembered now and then that the First Aid and Rescue Parties have the hardest work to do in Civil Defence. Distressing sights are inseparable from war, but it is no part of firemen's work to help in unpleasant jobs if the specialist services are there. They are always there. Some one ought to broadcast about them.

ISOKON AND THE WAR

The name of Isokon is a sad addition to the wartime casualty lists. If this company is not officially dead it has suffered complete disablement, for it has had to stop production partly because of the shortage of raw materials and partly because it used to import a number of furniture parts ready-made from abroad.

*

I mention Isokon particularly, although I suppose there must be many other furniture makers who have suffered a similar fate, because it was an enterprise of particular courage and one that never let commercial expediency submerge the very personal point of view of its founder, C. Pritchard. In its short life it acquired several claims to distinction: for example, it is not generally known that in the first place Isokon made it possible for Gropius to come to this country. The now famous "long chair" that Breuer designed for the company is one of the few stock pieces of modern furniture that are likely to be of permanent æsthetic interest. It was really original, as were several other of its products in a slighter way, such as the Penguin Donkey designed by Egon Riss, which has the rare quality of wit.

*

Isokon's decease comes at a moment when what started as an experimental enterprise was at last finding its feet and beginning to perform its proper task—which was not to provide fashionable toys for the intelligentsia but to produce good modern furniture as cheap as only furniture designed in terms of modern industrial production can be. Arthur Korn had just designed a new chair of really cheap construction which, although not yet officially on the market, had already been welcomed by several very large buyers of chairs.

*

I understand that, in spite of the fact that the impossibility of importing parts from abroad has rendered a lot of Isokon's remaining stock useless, there is a limited number of pieces to be sold off. One hopes, as they may well be the last of their kind, that they will find good homes. They include several of the Breuer "long chairs," which will one day, I am sure, be collectors' pieces.

DAMAGED HOUSES

Everyone will be pleased at the Minister of Health's statement to local authorities that the Government will support them in a generous interpretation of their obligations to repair houses which are damaged by bombs.

*

Some local authorities have shown a cautious, peacetime inclination to cling to the condition that "lack of housing accommodation in the area makes (repair) necessary." Situations can obviously arise when the local authority has no option but to invoke this saving clause. But nothing could be worse for morale, nothing could be better calculated to increase the consequential damage of raids, than its invocation where the total damage in an area is small.

*

Even when a man is moderately prosperous, damage to his house involves him in expenses unconnected with repairs which are likely to require most of his ready money. And if only windows, doors or part of the roof are damaged—as is often the case—it seems absurd to divide the work into "tarpaulin" and "duration" stages. "Duration" repair at once will make all the difference to public confidence and the local authority's reputation among its own people: though of course these repairs cannot often be executed in the original materials of the house.

*

It is to be hoped that the Amending Bill which the Government intends to introduce to the Housing (Emergency Powers) Act will encourage local authorities to take this course wherever it is reasonably possible.

ASTRAGAL

# NEWS

## B.S.I.

British Standard Specifications for Portland and High Alumina Cement (B.S. Nos. 12 and 915) have just been issued. Details are printed below :

Portland Cement (B.S. 12).—There are two major features of the revision. One is the amplification of the specification to include cement of the rapid-hardening type for which there has so far not been a specification. The other is the replacement of the test for determining the tensile strength of a standard briquette by a compression test on a cement-sand mortar cube. The desirability of making this change was mentioned in the Foreword to the 1931 edition. Since that date the compression test has been the subject of further investigation, both at the Building Research Station and also by a panel of experts. It has been found to give results with different gaugers more consistent than those obtained by the tensile test, whilst another advantage is that the strength of the mortar cubes can be related to that of concrete made with the same cement. The cement mortar cubes are compacted in a specially designed vibration machine which is illustrated by a photograph and fully-dimensioned drawings.

As it is appreciated that the adoption of the new test will require the installation of the appropriate testing apparatus, the tensile test has been retained for use when specially required.

High Alumina Cement (B.S. 915).—It was considered desirable for the Specification for High Alumina Cement to form the subject of a separate document and that it should not be embodied in B.S. 12. The above standard has accordingly been issued. The general form of the Specification follows the same lines as B.S. 12, but in this case, as there was no traditional tensile test, the compression test has been included without the alternative of a tensile test. Copies of these Standards can be obtained from the British Standards Institution, Publications Department, 28 Victoria Street, London, S.W.1, price 2s. 3d. each, post free.

## AIR RAID DAMAGE

The Minister of Health, in a circular to local authorities in England and Wales, draws attention to the importance of adopting methods to ensure that first aid repairs to houses damaged in air raids which the owners are not repairing themselves are carried out with the least possible delay.

The aim of the local authorities in all cases should be to see that, before less urgent repairs are undertaken, no damaged house capable of repair is left with roof and windows uncovered. The simplest and quickest method of repair should be adopted. This will be particularly important during the shorter hours of daylight. The need for a quick completion of the work will mean that thorough reglazing of windows and retiling of roofs will generally be impracticable as a measure of first aid repair. Alternative and quicker methods should beadopted. For roofs, for instance, roofing felt, asbestos sheeting, and tarpaulins, where obtainable, should be used. For windows the practice of those local authorities which have been raided on several occasions of reglazing a quarter or a third of the window surface is commended. As a substitute for glass, roofing felt or waterproof building oaper would be suitable or, where a translucent material is required,butter muslin, cellulose, cotton fabric, or one of the glass substitutes on the market. Because of shortage of timber, windows should not be boarded up with timber.

## OBITUARY

We regret to record the deaths of Mr. Arthur James Driver, F.R.I.B.A., and Mr. Edwin Sheridan Gray, L.R.I.B.A.

## EXHIBITIONS

*Art Gallery, Brighton :* Exhibition of modern paintings. Until October 5.

*Architectural Association, 36 Bedford Square, W.C.1 :* Exhibition arranged by the Hull School of Architecture on the "Scalby Reception Centre, 1940." Until September 28.

*London Salon of Photography. At 26–27 Conduit Street, W.1:* Thirty-first annual exhibition of pictorial camera work.

*National Gallery, Trafalgar Square, S.W.1 :* Exhibition of British Painting since Whistler and the retrospective exhibition of the work of Augustus John, R.A.

## CHANGE OF ADDRESS

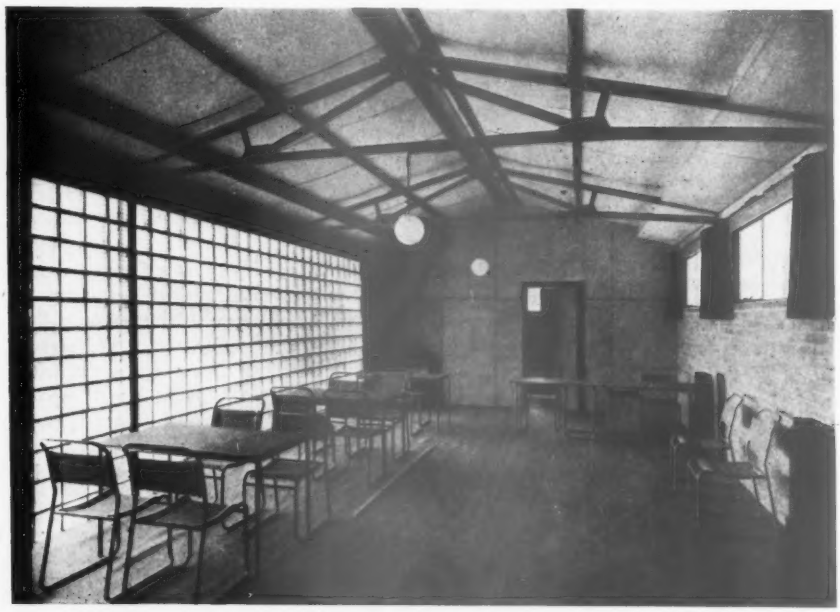
As from September 30, the temporary head office of the British Aluminium Co. will be Oakley Manor, Bell Vue, Shrewsbury. Telephone : Shrewsbury 4451.

## HULL SCHOOL

There are forty students in the Hull College of Art and Crafts School of Architecture, consisting of twenty-four full-time and sixteen part-time, and with this small number careful attention can be paid to each individual. The School is housed in the College Annexe in Park Avenue, is granted Intermediate recognition, and has a full-time Five Year Course with exemption from Final R.I.B.A. Testimonies of Study.

The Principal of the College is Mr. S. I. Hemming, A.R.C.A. (Lond.). The Head of the School is Mr. Max Lock, A.R.I.B.A., A.A.Dipl., who has recently succeeded Dr. J. L. Martin, M.A., A.R.I.B.A. The Lecturer in Design and Construction is Mr. B. A. Le Mare, A.R.I.B.A., assisted by Mrs. Diana Rowntree, A.R.I.B.A. The external examiner is Mr. Basil Ward, A.R.I.B.A.

The Session commenced on Monday, September 16. Intending students should apply for particulars of the Course to the Principal, College of Art and Crafts, Anlaby Road, Hull.



*Main hall of H.M. Forces Information Bureau in Trafalgar Square, which is officially to be opened tomorrow.*

# R.I.B.A. INDUSTRIAL HOUSING COMPETITION

*The winning schemes in this competition were published last week. On this and the following page we reproduce extracts from the Reports submitted by the winners of both sections of the Competition, together with sketches and notes by the Journal's Competition Critic, on some of the other schemes submitted in the Layout section.*

## HOUSE SECTION

### WINNERS' REPORT

*Below are extracts from the Report of Miss J. G. Ledeboer and George Fairweather :*

*Accommodation.*—The common requirement (for all types of labour) is for splinter and blast-proof sleeping accommodation, and necessary sanitary arrangements. These have been designed within a standard three bays structural unit. Two bays are devoted to the sleeping cubicles, and these are completely protected under A.R.P. requirement. The third bay of the unit is planned for the necessary sanitary accommodation, and for a small sitting room or lounge, where reading and writing can be done. This last bay has been provided with standard glazed windows covered with wire mesh, giving light and air into the unit, without damaging the A.R.P. properties of the sleeping cubicles.

This common standard has been adapted to suit the following classes of labour (see accommodation key plan) :—

A. *Adult Male.*—In the standard unit, beds have been provided for 8 men in 4 cubicles with locker accommodation. It is unlikely that more than one man will be sleeping in the cubicle at the same time, as they will be working in shifts. The cubic contents of the cubicle (432 cubic feet) therefore should be reckoned for one person only. In the third bay is a w.c., and a washing trough with cold water laid on. Hot water for shaving would have to be heated on the boiler, but as full washing facilities are provided at the wash-house, it is unlikely that hot water will be required.

B. *Adult Female.*—The accommodation is similar to that of the men, except in so far as the cubicle area is larger. It was felt that the women would require greater privacy. (Cubic contents of cubicle = 288 cubic feet.) Six women can be housed in the unit.

C. *Juvenile Males.*—A large number of boys aged from 16–20 are being employed in munition factories, and it has been found desirable to organize group accommodation for them. The ideal number for a group is about 60. A leader is in charge of the boys.

For supervision purposes the structural unit has been adapted to this accommodation by forming terrace groups of 6 units, the passage way in between forming adequate protection against blast between the blocks. In this manner sleeping berths are found for 60 boys. It has been found desirable to provide a larger recreation room for each group, and the structural unit, as an empty shell, forms an excellent recreation room, situated adjacent to the terrace block.

D. *Juvenile Females.*—The terrace unit as for boys can be arranged to accommodate 42 girls. Again the recreation room leader type bungalow should be attached.

*General.*—Accommodation has been provided for about 1,500–1,700 workers, the number varying according to the class of worker accommodated.

*Accommodation in Peace-time.*—The structural unit can be converted into a three-bedroom type house in peace-time by the addition of another storey.

Living room : 215 sq. feet provided with open fire.
Kitchen : 75 sq. feet fitted with boiler for hot water, and copper.
Bedroom 1 : 138 sq. ft.
Bedroom 2 : 122 sq. ft.
Bedroom 3 : 78 sq. ft.

The accommodation provides for a couple with 3 children.

The terrace units are similarly adapted. On the first floor the party wall is placed over the centre of the passage on to concrete flooring, and bedroom accommodation rearranged accordingly. The bathroom is placed on the first floor.

#### CONSTRUCTION OF THE WARTIME HOUSE

*The Walls.*—All external walls are to be brick built and 13½ in. thick. They are to be faced with selected common bricks. All window openings are to be formed at the outset and where these are to be built up for the duration of the war, a rebate will be formed on the outer face to give a key-like hold for the brick infillings. The brick filling will be executed with cheap bricks and where it joins the window reveals, sand bedding will be incorporated and lime pointing used. Light locked ventilating devices will be installed in the infilling panels and steel reinforcing rods will fasten the upper region to the main body of the permanent structure. Where these rods are installed, hollow clay blocks will be bonded into the brickwork and to cut the reinforcement when removing the infilling panels, it will be necessary to break down the uppermost block which forms the inner lining thickness of the ventilator.

To modify the danger of general collapse of the walls or roof by separation at the eaves junction, steel rods reinforce the connection at intervals of three feet all round the sleeping enclosures. These rods are embodied in the concrete of the roof slab and built into the cavities of clay block units which are incorporated in the brickwork for the purpose.

All internal walls which separate the sleeping enclosures from unprotected rooms and all main dividing walls within the protected areas are of 9-in. brickwork and all other permanent partitions are of 3-in. hollow clay block construction.

*The Floors.*—The ground floor is built of concrete laid over a bed of hardcore. A damp-proof interlayer will be incorporated in the concrete thickness unless the nature of the subsoil will allow for its omission.

The upper floor (or roof of the wartime building) is a 4-in. thick concrete slab laid *in situ*. The slab is supported at intervals of nine feet by the main external and internal walls, and by a beam in the middle of each sleeping enclosure. The clear span of each slab bay measures 8 ft. 3 in., and as this standard is applied throughout the whole of the scheme, the maximum use can be made of standard shuttering.

As an alternative to *in situ* construction, it is suggested that some advantage might be gained by the use of a precast concrete unit which provides the tensional reinforcement only. An inverted "Tee Beam" unit or a variation of the "U" unit may be capable of use in this way and a solid filling of site laid concrete would strengthen the slab against compression and give the required resistance to light projectiles from the air. Where this air-raid protection is not needed, it would not be necessary to fill the units solidly, cavities could be formed as desired by laying the concrete over sheets placed over some of the channels formed by the precast units. Continuity rods would be embodied in the site concreting over all supports, and some of these would be carried down into the walls to reinforce the junctions at ends and sides.

The upper surface of the roof slab is graded to the required levels by means of an application of lime and ashes. This would be removed easily when the upper floor structure is to be added. The falls are graded to a point above each washing space in the plan, and in this way gutters are not required. The roof is protected by a two-ply application of bituminous felt.

The chimneys are constructed in such a position as to allow for the arrangements of the fireplaces on the first floor of the peace-time house.

Provision is made in the roof construction for the removal of that part of the roof which covers the staircase of the peace-time plan, by the insertion of a dividing slip.

*The Windows.*—The windows are to be of standard metal section built directly into the brick reveals. The glazing may be of wired glass, or of clear sheet glass and protection against splinter may be gained by fitting wired screens on the inside. The peace-time installation of windows will rely on a concrete frame to fill the rebates formed in the brickwork, but otherwise will be the same as the present installation.

*The Doors.*—The external doors will be solidly built of timber and are to be retained in the peace-time structure. The internal doors will be built of light timber frames with asbestos board panels. They will be hung on pivot hinges to the brick wall reveals and to light wood or pressed metal frames in other light partitions.

*The Screens.*—The screens in sleeping enclosures and bathrooms will be built on a framework of asbestos cement studs. The lower level, to a height of 3 ft. 6 in., will be filled in with asbestos boards, and coloured fabrics will be hung between the frames at the upper level. Curtains will be hung on tracks for access to the cubicles in the sleeping enclosures and these will be secured to a batten for locking.

*The Equipment.*—The sanitary equipment will be as required for the peace-time houses except that an extra basin will be provided instead of the bath and the sink will not be installed meantime. A boiler is to be installed in the lounge and it is proposed that this will be of a pattern that will serve the peace-time needs as a water heater. The light cupboard and shelf equipment of the cubicles may have to be built of timber unless the performance of cellulose structures provides a suitable substitute.

*The Drainage.*—The drainage installation will be carried out as for peace-time requirements in fireclay pipes and traps. The above-ground installation may be executed in asbestos pipes.

*The Finishes.*—The internal wall and ceiling surface, will be treated with washable distemper and the floors will be covered with a stout corded matting laid directly over the concrete. Suitably arranged fixings will be incorporated in the concrete for the wood flooring to be installed when peace is restored.

*The Peace-time Structure Generally.*—The adaptation of the war-time building to peace-time needs and the addition of an upper storey will be carried out in a way that proves most appropriate at that time.

## ESTATE SECTION

### WINNERS' REPORT

*Below are extracts from the Report of Messrs. G. Grenfell Baines, John A. Ashworth, Stanley E. Catterall and Tom Mellor :*

The suggested type of development shown on the drawings would be capable of infinite variation and could in practice make use of existing country roads and field patterns rather than superimpose a new-scale development on the countryside.

For this reason, and because the undue repetition of small-scale domestic units in open development is regarded as bad from an æsthetic as well as social and economic standpoints a maximum of 400 houses for each unit is suggested.

It is considered that beyond this point the estate would assume the dimensions of a small town demanding a more formal urban treatment which is precluded by the conditions of wartime camouflage. It would also require additional communal facilities, provision for which in the present scheme would interfere with the efficient planning and organization of the unit.

Where requirements are substantially beyond the limit prescribed above, the formation of another estate unit would be undertaken. The drawings show how these units would be grouped in staggered formation along a residential loop road leading off and returning to the arterial road in a line governed to a certain extent by the number of units served and existing natural features.

Staggering the units and leaving open, probably agricultural, country between will result in a pleasant intermingling of village unit and countryside which, apart from amenity, will possess valuable camouflage properties.

Using an estate unit of the size given and laid out as proposed should allow for the establishment of schools on open ground in a central position, accessible to most of the children from the same side of the road as their homes, and to all by walking.

#### THE ESTATE PLAN

(a) *Road System.*—This consists essentially of a number of radial roads focussing on the community centre and connected by more informally planned link roads which give direct access to the houses.

By lengthening the radials and introducing new link roads it will be a simple matter to extend the estate to the desirable limit.

(b) *Community Centre.*—In wartime the accommodation provided includes a canteen to seat 500, necessary kitchen and stores, and cafeteria service. The canteen may be used for entertainments, lectures, dances, etc.

Air-raid shelter accommodation for the full seating capacity would be provided and planned for use in peace-time as chair storage, etc.

The baths and laundry block are grouped with the canteen as part of a recreation ground layout; some of the baths would be of the shower type now, so that in peace-time this block could be made into changing rooms for the recreation ground.

Peacetime shops would be used now as the necessary headquarters for A.R.P. activities such as head warden, cleansing and first aid, auxiliary fire service, home guards' room, etc.

A general store such as may be found in any village would be included in the present scheme.

A communal garage block approached from a separate yard is provided now—additional garages could be formed either at this point on the other side of the yard, or attached to certain of the semi-detached houses already designed with this in view.

The canteen, shops and garages are planned round three sides of a square.

A nursery school is also planned in the centre. This building, capable of future extension, will be able to serve many useful purposes : crèche, clinic and infant welfare centre in war and peacetime.

The canteen and adjoining buildings are designed for easy conversion into a community centre comprising village hall, club rooms, changing rooms, etc., which, with the recreation ground, will form a focus of village life.

#### HOUSE UNITS AND SITING

It is considered that an estate of this size merits at least two type plans, the smaller more suited for terrace grouping, the larger for semi-detached or detached. They are designed for a wartime use which will prove adaptable to peacetime requirements with a minimum of structural interference and expense.

#### CAMOUFLAGE

The road plan of the estate would, as suggested, conform in scale and general lines with the surrounding pattern of field boundaries.

Certain roads would be emphasized with trees and hedges to continue this pattern over the estate. They would form the divisions between groups of houses each of a consistent but inconspicuous pattern.

The house blocks are staggered to break up their shadow lines and this is also helped by the protective screen walls and by planting in relation to the blocks.

It is intended that a "colour pattern" approximating to that of some local form of field cultivation or use should be employed in painting all the houses in a group and that this pattern should as far as possible be continued by the

choice and arrangement of planted vegetation in the adjoining gardens and road verges. The "colour pattern" of an adjoining group may be arranged to contrast or vary but would also be consistent throughout the group, thus producing a patchwork field pattern by imitating both the hedgerow network and the surfaces of surrounding fields.

To complete the countryside pattern a suitable number of house blocks scattered over the estate are emphasized by being painted to resemble local cottages or farm groups and sufficient of their access roads made easily visible from the air.

### OUTLINE SPECIFICATION

ROADS.—Strip vegetable matter and top soil to approved levels. If on clay lay 3 in. of ashes. Lay 6 in. hand packed pitching and 2½ in. consolidated thickness of tarmac with ¾ in. consolidated thickness bitumastic and limestone topping. Roads to be picked out for camouflage are to have top dressing of white limestone chippings.

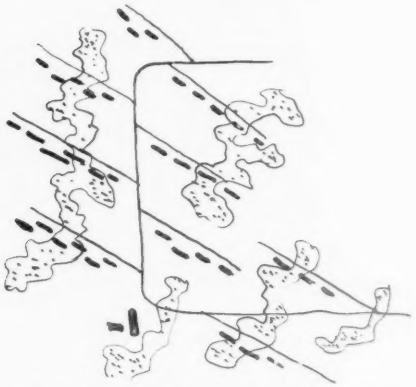
FOOTPATHS.—Strip as before, lay ashes if on clay. 4½ in. brickbats and 3 in. gravel or tarmac or 2½ in. precast flags on sand.

PLANTING.—Type of trees would be dependent on locality. Generally quick growing deciduous trees such as planes, sycamores or catalpa would be planted in groups and hedgerows. Poplars by roadsides, particularly in the case of flat country. Where conifers are present, larch, Wellingtonia and cupressus in groups and spinneys. Burberry or lonicera for hedges.

SERVICES.—Electric light. Instantaneous gas heater over sinks, capable of producing from cold to boiling water.

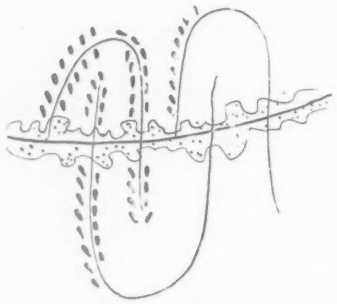
## OTHER DESIGNS SUBMITTED

Below are sketches and notes, by the JOURNAL's competition critic, of some of the designs submitted.

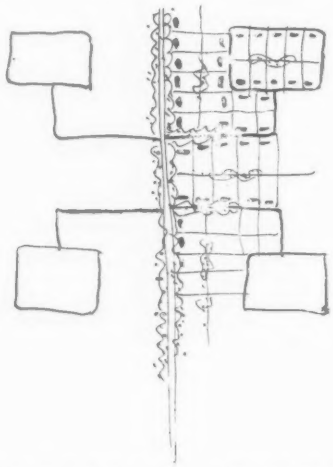


A: *This is an attempt at uniform orientation disguised by a strong superimposed pattern of trees which breaks up and confuses the shadow lines of houses.*

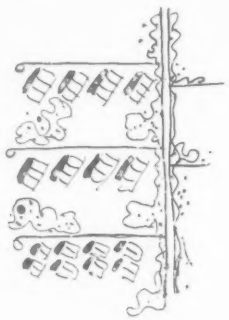
B: *This, showing the principle on which one of the prize-winning layouts is based, is an attempt at giving an indeterminate appearance from the air by using a zig-zag pattern of roads and, in contrast to scheme* A, *a pepper-and-salt arrangement of houses. The road system could not be easily worked into the normal rural pattern, and it is doubtful if a pattern based on regular irregularity is likely to be less obvious from the air than a simpler rectangular one.*

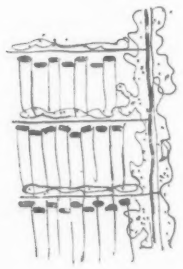


C: *Combines orientation and the serpentine line. It is typical of several schemes based on the false assumption that curvilinear forms are less easily distinguished from the air than rectangular ones. A pattern of this kind, suddenly imposed on the distinctly rectangular field pattern, would at once attract attention, though admittedly it might be baffling when seen for the first time.*

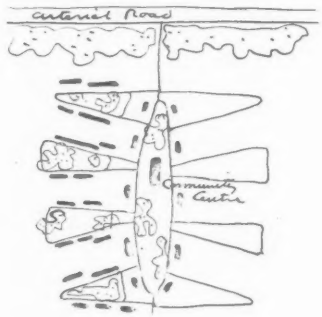


D: *Text book geometry. Typical of a disappointingly large number of designs. Ingenious "plotting" without regard to prospect or exposure. Long ago condemned as obsolete paper-pattern technique.*

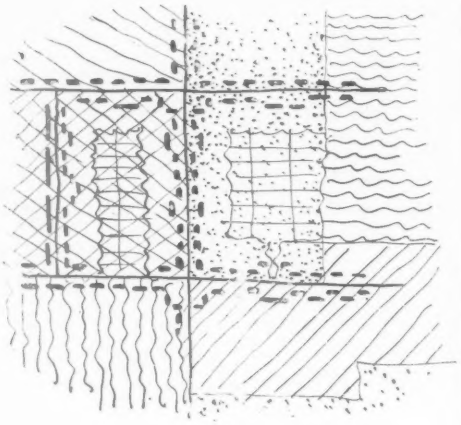




E and F: *Systems of siting adopted in two schemes, where the separate functions of roads and road economy have been observed, together with studied orientation and a desirable degree of "concentration with openness," to use Mumford's phrase. But the strongly repeating pattern, though adaptable to the rectangles of fields, is likely to be too obvious from the air. The principle shown in diagram* F *was adopted by one of the prizewinners.*




G: *The layout plan submitted by the Coventry group, which won one of the prizes in the House Section. This is one of the most* livable *layouts submitted. It is an extension of the idea of the traditional English village green, with houses grouped in an orderly but more or less informal way round tree-planted common land. The pattern of the scheme, thoroughly humane pattern though it is, is likely to be too clearly read from the air.*



H: *This layout, one of the £10 prizewinners, is ingenious and effective in its camouflage system, though somewhat conventional in its siting. Distinct forms of cultivation—ploughed land, oat fields, orchards, intensive vegetable growing, etc.—are plotted out to conform more or less to the road system and to give maximum contrast with one another in colour and texture. Each distinct form of cultivation actually engulfs the houses, or is made to appear as if it does, the houses being appropriately coloured and camouflaged.*

*A model was submitted with this scheme, and a series of photographs which had been taken from heights (in scale) varying from 500 to 15,000 ft. These are interesting, though not entirely flattering to the scheme. In reality, the cultivation pattern would dominate the house pattern to a greater extent than is apparent in the model or sketch.*

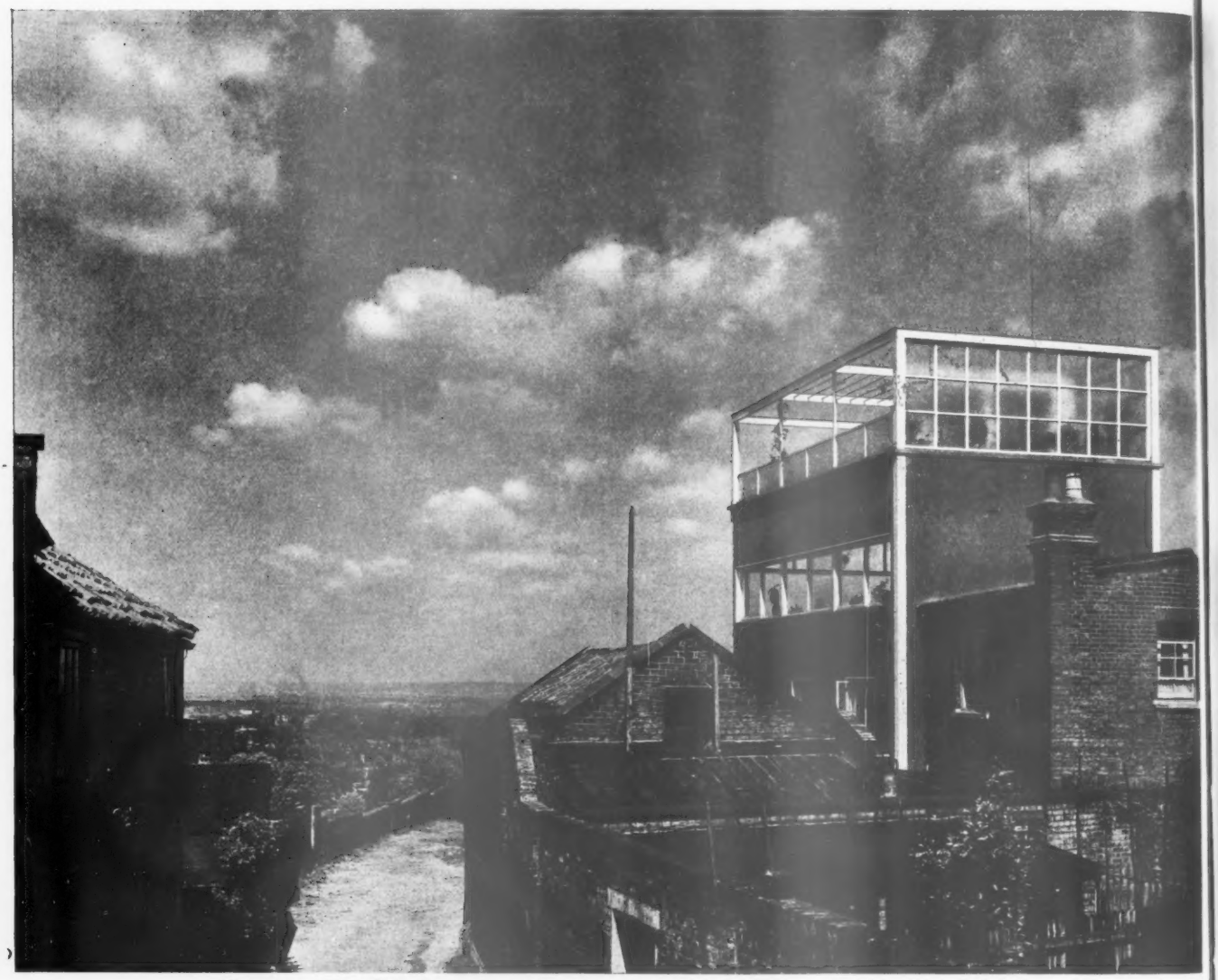
*The entrance front*

# HOUSE AT HIGHGATE

*DESIGNED BY TAYLOR AND GREEN*

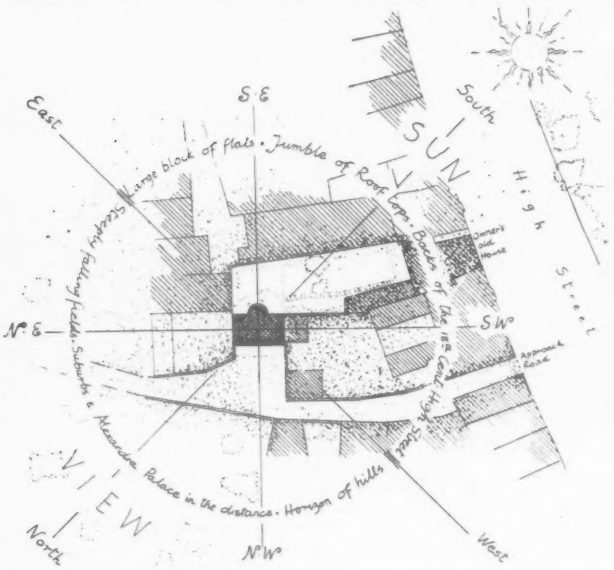
GENERAL AND SITE—This house, at the top of Highgate Hill, is on the north-east side of Highgate Village High Street, and is approached either by a private road through an archway from the High Street or from the garden of a house in the High Street already occupied by the owner. The new house, whose chief purpose is to provide a large studio with living accommodation attached, can therefore be used either in conjunction with the old house or as a separate dwelling.

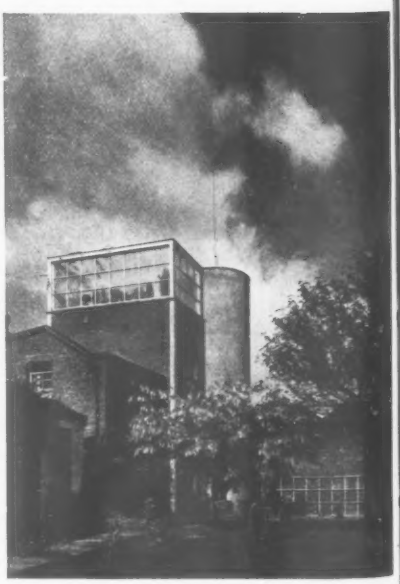
CONSTRUCTION—Brick, with steel joists spanning the large window openings. Cellar and ground floor, 13½ in. solid; first and second floors 11 in. cavity. Supports to steel joists over ground floor, 13½ in. brick piers; over studio windows, 2½ in. steel columns with 11 in. brick piers at end. On each floor the structure consists of three equal bays. Above roof level the whole structure is of wood, except for the intermediate pergola posts, which are of metal T sections. Non-structural partitions are of 3-in. clinker blocks. Staircase consists of 1¼-in. deal treads and risers spanning direct from the 9 in. brick wall to the central column without carriages or soffits.



*The upper part of the house seen from the approach road. Below, view from the garden.*

EXTERNAL FINISHES—The walls are rendered dark red on three sides and pale grey on the garden side, with a very rough texture. The corners of the building and the window reveals are rendered smooth and painted white, like all the exterior woodwork. Ground floor soffit reveals and piers are painted pale grey, the garage doors and the panels below the kitchen windows are dark grey and the porch walls are of yellow tile. Plinth is of dark blue bricks with white pointing. Except for the large north-east studio window, which consists of fixed panes framed *in situ* by the builder, all windows open to their full area and all are of wood, of proprietary Swiss pattern imported ready made.



HOUSE AT HIGHGATE • DESIGNED

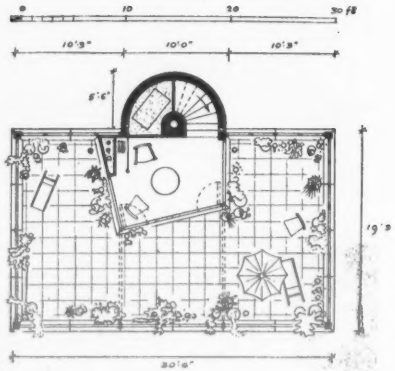
*A detail of the main entrance door in the centre of the street front.*

*Side elevation, facing north-east*

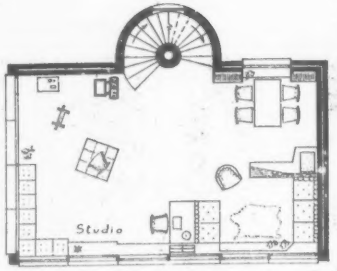
*The garden entrance*

BY TAYLOR AND GREEN

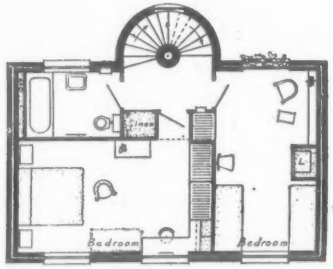
*Looking from the dining corner to the working end of the studio.*



ROOF PLAN




SECOND FLOOR PLAN




FIRST FLOOR PLAN

PLAN—The house presented an unusual problem in planning, as local town-planning regulations only permitted the building to occupy the same area as that covered by a cottage formerly on the site. This was a rectangle 30 ft. 6 in. by 19 ft. 3 in. This small area necessitated a vertically planned building to provide all the accommodation asked for. The most important requirement was one very large room to serve as a studio as well as a living room. This made it desirable that the staircase should not take up valuable space within the main rectangle, and special permission was obtained to project the staircase into the garden. The large studio-living-room occupies the whole of the second floor, the staircase emerging directly into it. On the first floor are bedrooms and a bathroom, the latter acting also as a cloakroom for visitors on their way up to the studio. On the ground floor, besides the entrance hall, are the kitchen and a maid's bed-sitting-room, forming a self-contained service unit. A service

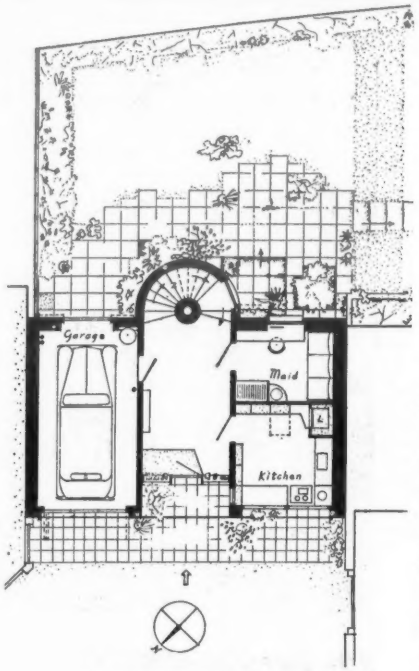
rough plaster distempered a greenish grey ; all woodwork is painted white, except the flush doors, which are waxed sapele

FIRST FLOOR PLAN

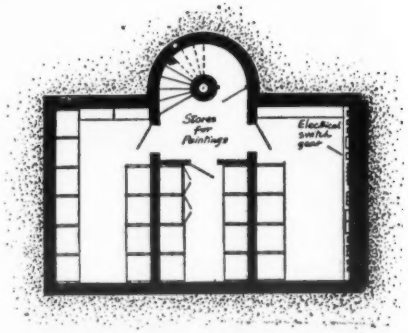
besides the entrance hall, are the kitchen and a maid's bed-sitting-room, forming a self-contained service unit. A service lift connects the kitchen with the upper floors. The large entrance hall links the front door with the garden door in the staircase wall. The stair continues down to a cellar equipped with racks to hold the owner's paintings. At the top the stair winds up out of the studio into a small sitting-room at roof level, surrounded on three sides by a roof terrace.

INTERNAL FINISHES—Entrance hall : walls and ceiling are of rough plaster distempered a greenish grey ; all woodwork is painted white, except the flush doors, which are waxed sapele mahogany, striped vertically ; metalwork is dull chromium and the carpet grey cord. Studio : walls and ceilings are of rough plaster distempered white and the floor is of oak plywood squares ; chairs are eighteenth-century ones of Greek pattern ; book-shelves are of gaboon and bubinga veneers with white painted edges. Staircase : column is of smooth white plaster ; back wall is of rough plaster distempered greenish grey ; soffit is pink ; grey cord carpet and magenta cellulosed handrail.

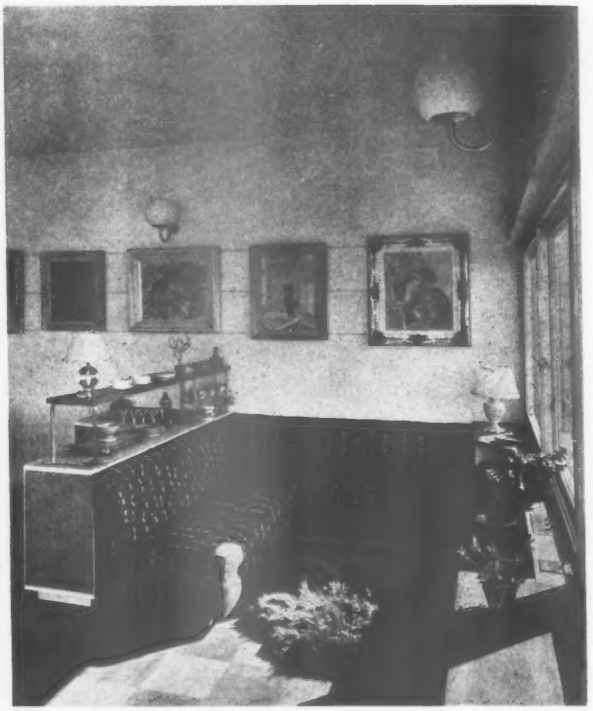
*Looking from the studio portion, with the dining and sitting corners at the far end.*




GROUND FLOOR PLAN




CELLAR PLAN



*Above, two views of the sitting corner of the studio; left, the entrance hall.*

## HOUSE, HIGH STREET, HIGHGATE

*Above, looking into the smaller bedroom from the staircase landing. Right, dining corner of of the studio*

INTERNAL FINISHES (*continued*)—Kitchen : Considerable colour has been introduced into the kitchen, only the cupboards and the wall tiling being in white. The wall over the sink is yellow flat enamel and the opposite wall dark green flat enamel. The table tops are light red linoleum and the floor dark red linoleum. The interiors of the glass-fronted cupboards are in a dark red flat enamel. There is also a roller blind of green and white glazed chintz. Large bedroom : Walls and ceilings are of smooth plaster, distempered white ; carpet in grey pile. Smaller bedrooms : Wallpaper has red and blue flowers on a white ground ; carpet, grey pile. Bathroom : Glossy white enamel walls but with the wall behind the bath in chocolate brown flat enamel ; white ceiling is distempered, to prevent condensation ; floor, light red linoleum, which is carried up the side of the bath. Roof garden : At roof level is a small sitting room into which the staircase directly leads. This is glazed on three sides, all of which can be completely opened. Windows are of wood painted white. Roof garden is screened with obscured glass panels on the two sides that are overlooked by other buildings. The other two sides are open, one having an obscured glass balustrade and the other, where the view is best, an open metal one.

SERVICES—Heating, hot water, cooking and lighting are all electric. Heating is by oval section tubular heaters which project 2¼ in. from the wall and are accommodated beneath window shelves, etc. In the studio there are continuous tubes of the same lengths as the windows to counteract heat losses from the large glass surfaces.

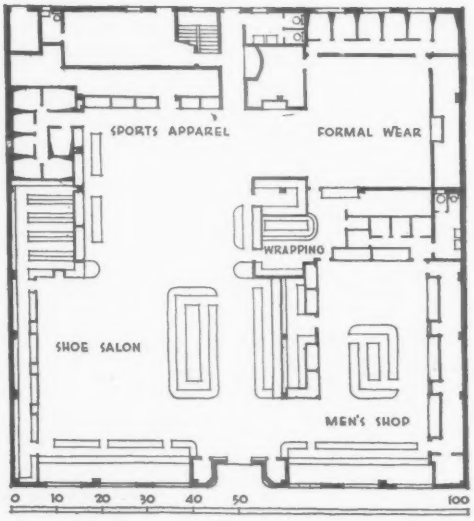
COST—The total cost was £3,000, including demolition and all the furniture except a few pieces from the owner's former house.

General contractors were W. M. Glendinning ; for list of sub-contractors and suppliers, see page xvi.

DESIGNED BY TAYLOR AND GREEN

# STORE IN FLORIDA


*ARCHITECTS:*
*POLEVITZKY AND RUSSELL*




GENERAL—A branch of a New York store at Miami Beach, Florida. The clients required four different specialist departments to be grouped together in a way which emphasized their separate functions. Each department has only a small amount of stock on display and a much larger amount stored in a readily accessible manner. The wrapping room serves all departments.
CONSTRUCTION—R.C. frame with concrete block infilling faced with 3 ft. by 2 ft. by 2 in. Florida keystone blocks in aluminium channels. Interior is plastered. Roof is of bituminous sheeting on steel and boarding.
*Above, the main front. Photograph and plan are reproduced from "Pencil Points."*

*Wall of the shoe department is dark grey-blue, striped in royal blue. Interiors of cases are very light blue-green.*

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DIAGRAMS ILLUSTRATING VARIOUS ARRANGEMENTS OF STEEL ROOF CONSTRUCTION.
(a), Normal requirements.

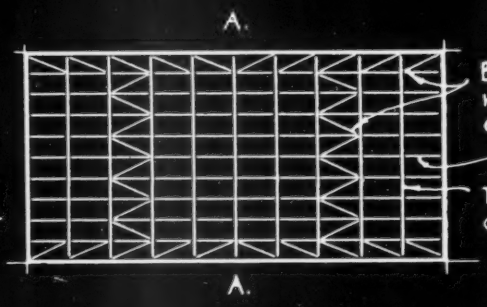


FIGURE 1: TYPICAL PLAN OF STEEL ROOF CONSTRUCTION.

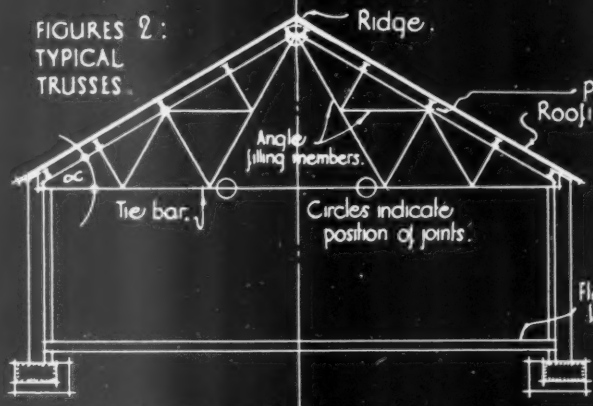


FIGURE 2a: Triangular trussed roof.

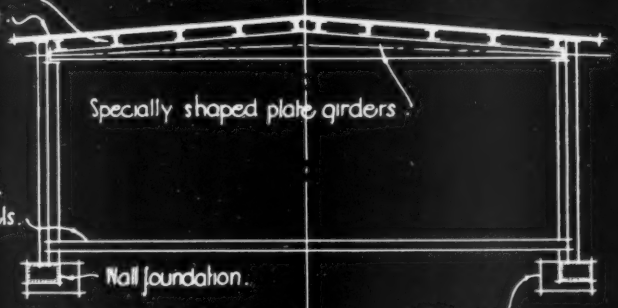


FIGURE 3: Pitched roof.

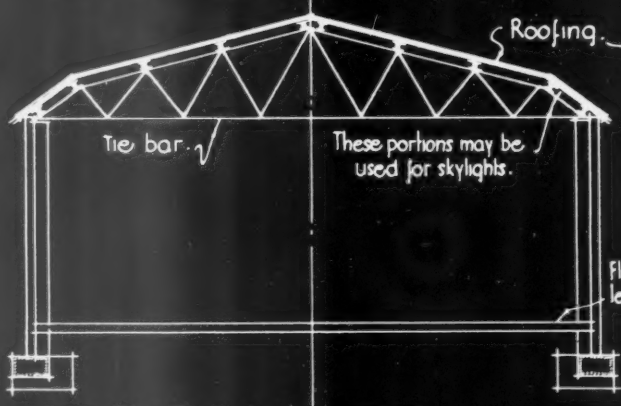


FIGURE 2b: Parabolic trussed roof.

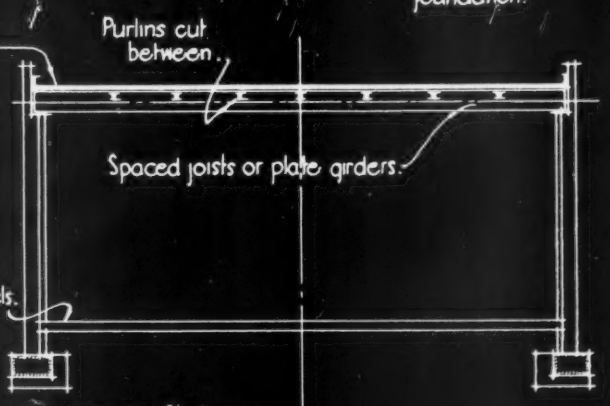


FIGURE 4: Flat roof.

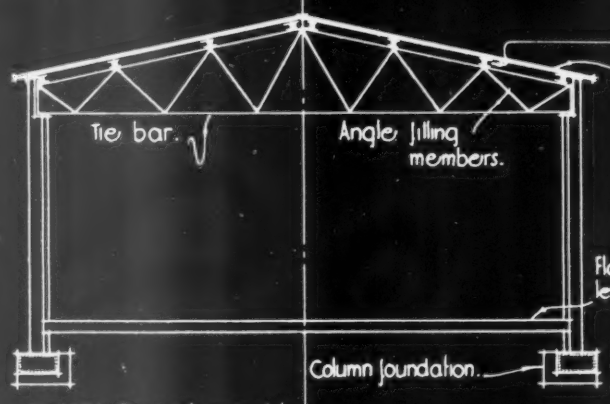


FIGURE 2c: Chorded truss.

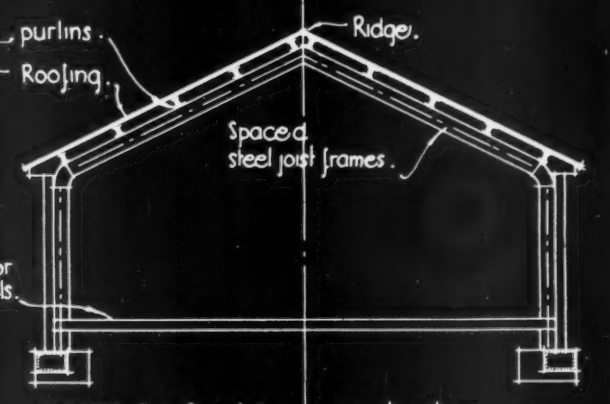


FIGURE 5: Rigid frame construction.

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INFORMATION SHEET: STEEL FRAME CONSTRUCTION: No 33.
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# INFORMATION SHEET

## • 805 •

# STRUCTURAL STEELWORK

**Subject :** Steelwork for Roof Construction, I : Arrangement of Roof Construction : (*a*) Normal Requirements.

**General :**

This series of Sheets on steel construction is not intended to cover the whole field of engineering design in steel, but to deal with those general principles governing economical design which affect or are affected by the general planning of the building. It also deals with a number of details of steel construction which have an important effect upon the design of the steelwork.

Both principles and details are considered in relation to the surrounding concrete or masonry construction, and are intended to serve in the preliminary design of a building so that a maximum economy may be obtained in the design of the steel framing.

This Sheet is the thirty-third of the series, and deals with various arrangements of steel roof construction for normal requirements. A further Sheet will illustrate the arrangement of the roof construction for special requirements such as lighting, flat roofs and multiple nave construction.

**Elements :**

Roof construction consists essentially of two parts—

(1) Members of short span which carry immediately the load of rafters or slabs : purlins.

(2) Members of long span which carry the purlins and are usually trusses, but sometimes joists or plate girders.

A typical roof plan is shown in Figure 1.

**Trusses :**

For the longer span (Direction A—A, Figure 1) a truss has the advantage that it follows the line of the roof and can be of great structural depth, thus allowing the maximum economy.

Typical trusses are shown in Figures 2a, 2b and 2c. Figure 2a shows a triangular truss, and the angle $\alpha$ is arranged more than 20° to allow reduction in the superimposed load. Transport and erection are both simple, joints being arranged at the points indicated by circles.

Figure 2b shows a truss the upper chord of which has a more parabolic form and which is usually more economical as far as steel is concerned, but more expensive with regard to roof covering. This shape has the advantage that the steep sections, indicated by a thick line, can be used for skylights.

Figure 2c is of advantage in steel construction, as the stresses in the chords near the supports are smaller than in Figures 2a and 2b, and it is particularly applicable where solid roof slabs are used or where the building requirements necessitate variation in the length or depth of the truss, e.g. in cinema construction.

**Joists and Plate Girders :**

Joists or plate girders would be used for larger spans only where headroom is restricted, or where, for any other reason, a very shallow construction is required. Large joists require less labour but are restricted to about 50 ft. span, while plate girders can be used from 30 ft. upwards.

Between the limits of 30 ft. and 50 ft. plate girders will usually be economical in material but not in labour. Where the span is greater than 50 ft., plate girders would be the only possibility for shallow construction.

The depth of a truss should never be less than 1/10th of the span, while in the case of plate girders a depth of 1/24th of the span can readily be permitted. Figures 3 and 4 show the application of large joists and plate girders.

**Rigid Frames :**

In certain cases the additional amount of material necessitated by shallow construction may be compensated by the arrangement of a rigid frame, the typical construction of which is shown in Figure 5. Rigid frames are particularly economical where the apex can be lifted up in relation to the edges, as by this means use can often be made of the slope of the roof.

**Spans :**

Besides the economic and utility factors discussed above, there are numerous other conditions which affect the choice of roof construction in relation to the span of a particular building. The arrangement, for instance, may be directly affected by the type of building and the use to which it is to be put, as well as by the headroom, lighting and heating requirements, the spacing of the main girders or trusses, the height of the apex, and the type and weight of the roof covering.

**Previous Sheets :**

Previous Sheets of this series dealing with structural steelwork are Nos. 729, 733, 736, 737, 741, 745, 751, 755, 759, 763, 765, 769, 770, 772, 773, 774, 775, 776, 777, 780, 783, 785, 789, 790, 793, 796, 798, 799, 800, 801, 802 and 804.

**Issued by :** Braithwaite & Co., Engineers, Ltd.

**Address :** Horseferry House, Horseferry Road, Westminster, London, S.W.1

**Telephone :** Victoria 8571

*SOME QUESTIONS ANSWERED THIS WEEK:*

★ *FOR a small extension we are erecting the client has asked us to use rubber roofing slates. Where are these obtainable?* - - Q493

★ *CAN you give me the names and addresses of some reputable firms to whom I can write for illustrations and prices of electric fans? These are for hospital work, and I wish to keep my enquiries to the makers of silent or nearly silent fans* - - - - - Q497

★ *CONSIDERABLE nuisance is being experienced in factory premises here from dust arising from the concrete floors. What steps can be taken to alleviate the trouble?* - - - - Q501

★ *DO you know if there is such a thing as a proprietary type of food cupboard suitable for fixing against an external wall where air brick ventilation could be introduced?* - - - Q505

THE ARCHITECTS' JOURNAL

# INFORMATION CENTRE

THE Information Centre answers any question about architecture, building, or the professions and trades within the building industry. It does so free of charge, and its services are available to any member of the industry.

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*Enquirers do not have to wait* for an answer until their question is published in the JOURNAL. Answers are sent direct to enquirers by post or telephone as soon as they have been prepared.

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Finally, if an answer does not provide all the information needed, the Centre is always glad to amplify any point on which the enquirer wants fuller explanation.

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45 THE AVENUE, CHEAM, SURREY
*Telephone:* *VIGILANT 0087*

*or ring the Architects' Journal Information Centre at*

REGENT 6888

Q492 ARCHITECT, YORKS.—*Is it possible to obtain SECOND-HAND TIMBER without a licence?*

Second-hand timber is now listed as:

(*a*) Timber or plywood obtained from the destruction, demolition or breaking up of any structure or article; or

(*b*) Timber or plywood which having been utilized for any purpose has thereby deteriorated; or

(*c*) Slabs or off-cuts produced in any saw mill in the United Kingdom; and is all termed "recovered-unclassified." Under the Control of Timber (No. 15) Order, S.R. & O., 1940, No. 1438, no one may buy or offer for sale any such timber without a licence or at a price exceeding that laid down in Article 7 of the Control of Timber (No. 13) Order, S.R. & O., 1940, No. 1098, and the price must be submitted by both buyer and seller to the Minister of Supply for approval. Alternatively, either parties may apply to the Minister of Supply for a price to be fixed for the disposal of this timber, particulars such as sizes and quantities being submitted.

"Recovered-unclassified" timber is subject to the full licensing procedure laid down in the Control of Timber

(No. 13) Order. The new regulations concerning this type of timber came into force on August 13, 1940.

Q493 BUILDERS, LONDON.—*For a small extension we are erecting the client has asked us to use RUBBER ROOFING SLATES. Where are these obtainable?*

We have no knowledge of any form of rubber roofing slate. Probably what the client has in mind are the slates produced by the Ruberoid Co., Ltd., Lincoln House, High Holborn, London, W.C.1. These consist of a bituminous base finished in different patterns and in green, red and steel blue surface finishes. If this is the type of roof covering the client has in mind, the " Flextile " strip shingles of D. Anderson and Son, Ltd., Roach Road Works, Old Ford, London, E.3, might also be of interest. These again are on a bituminous base and are available in red and green colours.

Q494 BUILDERS, LONDON. — *Is there a PERMANENTLY PLASTIC REFRACTORY CEMENT? In our own office we have a slow combustion stove and a short length of iron pipe connecting this to a brick flue. We have used a number of different forms of cement as packing where the iron pipe enters the flue, but all seem to shrink or crack and in time fall out.*

There are a number of resilient mastics made which, under normal conditions of exposure, are likely to remain plastic over a considerable period of time, but the manufacturers do not claim resiliency under conditions such as those outlined in the inquiry. Where hot iron pipes exist a joint made by coiling asbestos string packing around the pipe and then tamping this packing into position is likely to be the best solution.

Q495 ARCHITECT, MIDDLESEX. — *I shall be obliged to you if you will let me know if there is any form of HEATING suitable FOR a reinforced concrete DOMESTIC SHELTER, other than by electricity or paraffin. The shelter mentioned is situated at a considerable distance from the nearest supply of electric power, which makes electrical installation too expensive. It is not equipped with air-conditioning plant and, therefore, any form of paraffin heater would be undesirable.*

The enquirer has set a difficult problem. If an electric lead for heating is too expensive, so probably will be a gas lead, a " bottled " gas stove and equipment, or any form of solid fuel heating—and all have other disadvantages. In our view the enquirer, or his client, regards the fumes from a modern paraffin stove with undue apprehension. If such a stove is kept clean and properly trimmed, neither fumes nor smell are objectionable, providing there is some provision for ventilation.

Q496 BUILDING CONTRACTORS, LONDON. —*Who makes " Illingworth " GAS-PROOF FELT?*

E. Illingworth & Co. (Bradford), Ltd., Shelf Mills, Shelf, nr. Halifax.

Q497 ARCHITECT, LONDON.—*I should be obliged if you would kindly give me the names and addresses of some reputable firms to whom I can write for illustrations and prices of ELECTRIC FANS. These are FOR HOSPITAL WORK, and I wish to keep my enquiries to the makers of silent or nearly silent fans.*

The firms given below* manufacture ceiling, oscillating bracket and table fans designed for silent operation. With individual fans the noise or hum is due largely to vibration set up between the fan and the mounting and most manufacturing firms will provide vibration elimination mountings and bases.

Q498 SURVEYORS' DEPARTMENT, TRANSPORT FIRM.—*In view of the COSTS OF BUILDING, which have been increasing very considerably since the war began, we are considering increasing the amounts to be covered by insurance for rebuilding in case of damage. Could you give us some proportion to add to the existing value for this purpose?*

It is impossible to give such a figure with any degree of accuracy. For any particular building or type of building the increase in building costs under present conditions should be ascertainable, but the figure will be different for, say, single-storey garage buildings, multi-storey warehouses, office buildings and shop premises. No doubt the buildings in question could be grouped under some such headings and in each group an average in a case could be calculated as follows: The original building cost could be subdivided under trades: the approximate proportions of cost between labour and materials in each trade was given in Question 328 published in THE ARCHITECTS' JOURNAL for May 23, 1940. For the increase in cost of materials under each main trade, and also increase in labour costs, reference could be made to the Prices Supplement published in THE ARCHITECTS' JOURNAL in the first issue of each month. The original cost and the present cost of building are then known, but an additional allowance would be necessary if it is felt that in reconstruction alternative materials would be needed to take the place of timber, steel, etc., normally used. By this means a percentage increase in cost would be determined for each type of building, and the process of calculating this increase could be carried out by any competent quantity surveyor.

Q499 ARCHITECT, GLAMORGAN.—*I should be extremely obliged if you could advise me upon the following. I want a form of PARTITION UNIT which can be papered or otherwise cheaply decorated and which will have 100 per cent. salvage value. I know of steel and glass partitions and screens, but what I have in mind is something cheaper and more permanent in appearance, which at the same time can be taken down in units or sections and re-erected and re-decorated.*

Messrs. Casebourne & Co. (1926), Ltd., Imperial Chemical House, Millbank, S.W.1, introduced some years ago a system of dry-building their Pioneer plaster partition blocks which permitted of rapid removal after erection without damage to the blocks. Then Messrs. Assembled Units, Ltd., High Street South, London, E.6, sell a form of partitioning unit with dowel jointing capable of rapid erection and removal without damage. Normally this unit was formed by 2-in. blockboard, but with the altered conditions of supply existing within the industry the firm are producing the units in a plaster composition. Another possibility might be the use of Gypstele partitioning by Messrs. Honeywill and Stein, Ltd., 21 St. James's Square, London, S.W.1. This is formed of thick plaster board fixed by light pressed metal framing. At present, pressed metal is not generally available, but it may be that the proposed building is of national importance and will therefore have a first call on stocks.

Q500 WORKS MANAGER, TOTTENHAM.—*The glazing of our northlights has been boarded over outside for BLACKOUT purposes, but we are considering now*

* *Hotpoint Electric Appliance Co., Ltd., 24 Newman Street, London, W.1; Marelli & Co., Ltd., Artillery House, Artillery Row, Victoria Street, London, S.W.1; Crompton Parkinson, Ltd., Bush House, London, W.C.2; Siemens Electric Lamps and Supplies, Ltd., 38–39 Upper Thames Street, London, E.C.4; Hove Electric Co., Ltd., 30–31 Great Queen Street, Kingsway, London, W.C.2.*

*TREATMENT OF THE GLASS ITSELF so that, in the event of shattering by blast, splinters are not showered upon the work-people and machines underneath. What treatment would you recommend?*

Since the glass has been boarded over the question of the admission of daylight through the glass does not arise. That being the case the glass could be painted over inside with a liquid bitumen or bitumen emulsion and into this film whilst tacky a jute scrim could be embedded. Under blast action such a precaution should prevent the glass fragments from flying. There will still be the danger of large areas of the shattered glass falling into the premises while still adhering to the jute scrim. This danger could be overcome by fixing large mesh wire netting close below the glass and scrim.

Q501 WORKS ARCHITECT, BUCKS. — *Considerable nuisance is being experienced in factory premises here from DUST arising FROM the CONCRETE FLOORS. What steps can be taken to alleviate the trouble?*

The firms given below* sell preparations for this purpose. No indication is given about the nature of the traffic on the floor, but the solutions suggested above will be quite suitable where only foot traffic and rubber-shod light trolleys are used. If heavy iron-shod trolleys are used this should be mentioned at the time of approaching the firms named, since it may be that on the trolley runways special precautions will have to be taken.

Q502 ARCHITECT, LONDON AREA. — *I am responsible for building public shelters in a district near London and am experiencing difficulties and delays in the supply of common building bricks. I have been offered considerable quantities of an inferior grade of London stock brick—"PLACERS" I think is the term used to describe them—but I am dubious whether I should accept such a brick for this work. These bricks are extremely soft and almost, apart from colour, like a scouring bathbrick. Do you consider their use suitable FOR SHELTER CONSTRUCTION? The shelters will be built of 13½ in. walls and wholly above ground.*

"Placer" bricks have sufficient weather resisting qualities for air raid shelter construction. Concerning their resistance to splinters, the enquirer should consult his Regional Technical Officer of the Ministry of Home Security, who might consider it necessary for "placer" brick walls to be 18 in. thick instead of the usual 13½ in.

Apart from this possibility, there would appear no disadvantage in the bricks being soft. On the contrary, softness of material—providing there is sufficient thickness—is an asset. 1½ in. of mild steel plate is stated to give a protection equivalent to 13½ in. of brick or 30 in. of earth. But there must be few people who would not prefer the earth (with its cushioning effect against blast) to the steel.

Q503 ARCHITECT, NORFOLK.—*I want some information about the BEST DOMESTIC WATER SOFTENER. Can you give me some names of makers other than Permutit and Berkefeld, who are known to me? I have had no previous experience with water softening plants, and I am now interested in obtaining a small mains type softener and would like some information as to the merits of the different ones on the market.*

It would seem that there are no recognized routine tests which can be applied by independent testing authorities to determine standards of efficient performance. Until some such tests can be specified in detail and accepted generally by the industry, manufacturers or users can only judge probable performance under specific conditions by having tests carried out for themselves by independent consultants. Mains type water softeners are obtainable from the firms given below.*

Q504 ARCHITECT, WARWICKSHIRE.—*I should be obliged if you would give me the name of the firm producing the "Bellman" AEROPLANE HANGAR.*

Head, Wrightson & Co., Ltd., Teesdale Ironworks, Thornaby-on-Tees.

Q505 ARCHITECT, BUCKS.—*Do you know if there is such a thing as a PROPRIETARY TYPE OF FOOD CUPBOARD suitable for fixing against an external wall where air brick ventilation could be introduced? These are needed for cottage property where the Local Authority have served notices requiring food storage accommodation.*

It would appear that the only proprietary cupboard of this type is the "Fridge" hygienic larder by J. Duckett and Son, Ltd., Sanitary Ware Works, Burnley. The body of the unit is of glazed fireclay. In normal times it might have been possible to have suitable units made up in pressed steel, but in these days the only possibility would be timber. Enquiries made to two kitchen cabinet manufacturers seem to show that standard units of this kind are not available.

Q506 ARCHITECT, N. ENGLAND. — *Do you know of any firm in a position to offer a second-hand portable ELECTRIC GENERATING SET, heavy oil or petrol driven, 230 volts D.C. and not exceeding 50 k.w. capacity?*

The most likely firms to approach for this type of plant are given below.*

Q507 MULTIPLE TAILORING FIRM, ARCHITECTS' DEPARTMENT. — *Are these SHOP WINDOW WIRE STRAINING DEVICES any good?*

Manufacturers should be in a position to supply a report on the efficiency of their device based on tests carried out by an independent testing authority, and the two following official statements may be borne in mind:

*Hansard Parliamentary Proceedings of House of Commons, July 4, 1940.*

Mr. Doland asked the Home Secretary whether his attention has been called to mechanical devices for the protection of shop windows from the effect of blast in air raids; whether the resistance of any such devices to blast from high explosives has been tested officially or otherwise; and whether he can recommend their use, or will he advise shopkeepers of methods whereby the safety of the public from splintered plate-glass can be in any way safeguarded?

Sir J. Anderson: The value of devices of the kind to which my hon. friend refers has been under investigation, but the results so far obtained disclose no grounds for thinking that these devices are likely to prove as useful as the methods of protection recommended in the official publications already issued.

*Bulletin No. C4 entitled "The Protection of Glass in Hospitals," issued by the Ministry of Home Security, contains the following under the heading "General Notes":*

The breakage of glass by blast cannot be

* *Joseph Freeman, Sons & Co., Ltd., Cementone Works, Wandsworth, London, S.W.18; Sealocrete Products, Ltd., Atlantic Works, Macbeth Street, Hammersmith, W.6; R.I.W. Protective Products, & Co., Ltd., 16 and 17 Devonshire Square, London, E.C.2.*

* *Bell Bros. (Manchester), Ltd., 550 Abbey House. Victoria Street, S.W.1; Electrolux, Ltd., Luton, Beds.; Economic Water Softeners, Ltd., Aqua Works, Warwick Road, Tyseley, Birmingham; Hydro Co., Ltd., 41 King William Street, London, E.C.4.*

* *Petters, Ltd., Terminal House, 62 Grosvenor Gardens, S.W.1; Marryat and Place, Ltd., 40 Hatton Garden, London, E.C.1; Victoria Electric Plant Co., Ltd., 8 Spencer Street, London, S.W.1.*

prevented except by removal or possibly by closing up the window opening completely with brickwork or with substantial barricades as described in the Appendix to A.R.P. Memorandum No. 12. The primary object of such closure would be protection from bomb splinters, which are much more lethal than broken glass; the protection to glass is only incidental and is effective only when the closure is complete.

Secondly, nothing stuck on glass will make any material difference in the amount of glass broken by blast nor can any simple bracing system, so far examined, be relied on to help matters. There is no question of an adhesive treatment "saving" the glass.

The aims must be to prevent or at least reduce casualties from violent scattering of broken glass and to keep the room habitable after the glass is broken. This latter is mainly a matter of protection from the weather.

In the Ministry of Home Security A.R.P. Memo. No. 12, entitled, "The Protection of Glass in Commercial and Industrial Buildings" (His Majesty's Stationery Office, York House, Kingsway, W.C.2, price 4d. net), are details of the method recommended for the prevention of shattering of glass, and also reducing the likelihood of violent scattering of broken glass, by the use of framing, boarding and wire netting.

It might also be of interest to mention that Pilkington Bros., Ltd., of St. Helens, Lancs—the largest manufacturers of polished plate glass in this country—are conducting a series of tests on polished plate glass with a view to determining a method of efficient protection.

**Q508** ENGINEER DESIGNER, STAFFS.—*During the course of my work a query has arisen regarding the DEFLECTION OF REINFORCED CONCRETE BEAMS. I am unable to find any limiting value laid down for deflection, and no book to which I have access mentions the stiffness requirements for beams. It seems to me that no rule can be laid down giving a depth/span ratio as in the case of rolled steel beams, since the moment of inertia of a concrete beam varies with the percentage of steel quite independently of its cross sectional dimensions. In the case of steel beams the L.C.C. give as an alternative the rule that the deflections may not exceed 1/325th of the span. Can you therefore tell me if there is a corresponding rule for reinforced concrete beams? I am aware of the compression flange—span ratio as given in the Code of Practice, but this obviously does not meet the case.*

The limiting deflection of reinforced concrete beams is laid down in the original L.C.C. Regulations (1909) and should still be followed. The appropriate Clause No. 170 reads as follows:

*Deflection:* The total deflection of beams or slabs freely supported and uniformly loaded and subject to the permissible working stresses shall not exceed 1/600th of the span, when the span is 20 times the effective depth, and shall be in proportion to other ratios of span to depth, and for other conditions of ends and stress and loading.

**Q509** ARCHITECT, KING'S LYNN.—*I shall be pleased to know if any statistics exist relating to THATCHED ROOFS AND INCENDIARY BOMBS, particularly as to the likelihood of a bomb of this type being stopped by the cushioning effect of the thatch, and also the nature and construction of the incendiary bomb or fire platform placed over the ceiling joists to withstand the effect of burning thatching and roof timbers.*

No authoritative data seems available on the first point of this question, but it appears probable that only very thick thatch under rare circumstance would stop an incendiary bomb. In any case, whether the bomb lodges in or penetrates through the thatching, rapid burning of the thatch must be expected, and the ordinary standard of protection for a ceiling under a roof—a $\frac{7}{8}$ in. boarded floor or 1 in. reinforced cement screeding—must be regarded as inadequate to prevent the spread of fire from thatch to the rooms below. With normal ceiling joist construction, lightness of superimposed layers will be of importance, and probably the lightest form of efficient platform would be a $\frac{3}{8}$ in. thickness of Durasteel 3.DF2 fire protection sheeting. Even with the use of this material, it would be advisable to lay strips of asbestos felt over the ceiling joists and so insulate the underside of the sheeting from the timber. Alternative forms of construction which could be used are wood boarding, covered on top with about $1\frac{1}{2}$ in. thickness of a mixture of gypsum plaster and sand in equal proportions and reinforced in the thickness with chicken wire. Or, in lieu of the gypsum plaster, one of the plaster A.R.P. finishes such as Pioneer, Thistle or Insulex could be used in about 1 in. thickness and again with chicken wire reinforcement.*

**Q510** ARCHITECT, WORCESTERSHIRE. — *I am in charge of the erection of a new factory, and the details and supervision of the machine beds or foundations are also part of my duties. I should be grateful if you could inform me of any particulars that are published or any information available concerning FOUNDATIONS FOR PLANT AND MACHINERY. I should also be glad if you could give me some idea of the present cost per foot cube of small factory buildings, consisting of steel framing, brick walls and asbestos sheeted roof, etc.*

A standard work on this subject is "Foundations for Gas and Oil Engines and other Machinery," by Parry (1930), price 7s. 6d., published by Charles Griffin & Co., Ltd., 42 Drury Lane, London, W.C.2. As to present cube prices of small factory buildings, it is not possible to give any such information. Even in peacetime, generalizations about cost are dangerous. At the moment the method of finding an approximate cost of a structure which would be worth while is to take out rough quantities and try to forecast prices at the probable time of tendering.

**Q511** WORKS WELFARE OFFICER, MIDDLESEX.—*Owing to a large increase of staff it has been decided to enlarge the works canteen, and for this purpose the welfare and recreation building has to be adapted. This building was quite recently erected and the new polished hardwood dance floor becomes the floor of the main dining hall. I am anxious TO PRESERVE this floor. What material as cheap as possible, laid over the HARDWOOD FLOOR, would stand up to the conditions of wear of a canteen?*

Some form of linoleum covering would be the most reasonable choice. The material is easily cleaned by washing and has few joints through which water can gain access to the flooring underneath. It would be advisable also to lay a thick felt paper as an underlay to the linoleum. Any firm of linoleum layers such as Catesby, Ltd., 64–67 Tottenham Court Road, London, W.1; or Cellulin Flooring Co., 100 Victoria Street, London, S.W.1, would advise on means of adhesion which would allow of ready removal at a later date.

**Q512** BRICKMAKERS, SHROPSHIRE. — *We believe a table exists showing the relative thicknesses required to withstand BOMB BLAST on brickwork, metal, ordinary sandbags, etc. We cannot trace this and if you could give us these particulars we should be much obliged.*

The table in question appears on page 24 of Air Raid Precautions

* *DURASTEEL.—Durasteel Roofs, Ltd., Oldfield Lane, Greenford, Middlesex.*
*PIONEER A.R.P. FINISH.—Casebourne & Co. (1926), Ltd., Imperial Chemical House, Millbank, London, S.W.1.*
*THISTLE.—British Plaster Board, Ltd., Brettenham House, Lancaster Place, London, W.C.2.*
*INSULEX.—Honeywill and Stein, Ltd., 21 St. James's Square, London, S.W.1.*

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Handbook No. 5 entitled " Structural Defence " (His Majesty's Stationery Office, York House, Kingsway, London, W.C.2, price 2s. net) and is as follows :—

TABLE 2.11.2

*Thickness of materials for protection against bomb fragments*

| Material | Thickness |
|---|---|
| Mild steel plate or plates of an aggregate thickness, not less than | 1½ inches |
| Solid brickwork or masonry, not less than | 13½ " |
| Reinforced concrete, not less than | 12 " |
| Ordinary concrete, not less than | 15 " |
| Earth or sand, not less than | 30 " |
| Ballast, or broken stone, not less than | 24 " |

Equivalent protection would be given by these materials suitably combined in appropriate thicknesses. This table is not exhaustive and there are doubtless other materials which could be shown to be equally effective for the purpose.

Q513 ARCHITECT, LONDON.—*How does one obtain CEMENT SUPPLIES these days? I have asked a building firm to go ahead with a private air-raid shelter for a client of mine, but they say that while they can proceed with the excavations they will be unable even to start constructional work until a licence for the purchase of the cement is obtained.*

For the moment all cement supplies have been allocated to the work of different Government Departments. Contractors working on urgent Government contracts are issued with certificates to purchase (rather like the petrol coupons) which they forward with their order either to cement manufacturing firms or merchants. The same system obtains for contractors erecting air-raid shelters. Contractors erecting shelters may obtain supplies of cement by applying to the local authority, who in turn are allocated supplies by the Ministry of Home Security. If the work is in the London area application should be made to the Chief Administrative Officer, London Civil Defence Region, P.O. Box 501, London, S.W.1.

## THE BUILDINGS ILLUSTRATED

**A STUDIO HOUSE, HIGHGATE VILLAGE, N.6** (pages 235–241). Architects: Tayler and Green, AA.R.I.B.A. General contractor was W. M. Glendinning. Sub-contractors and suppliers included: Dorman, Long & Co., Ltd., structural steelwork (suppliers); Huntley and Sparks, Ltd., insulation—Cabot's quilt between double-joisted floors; Marston Valley Brick Co., Ltd., Marston bespres flettons; Beechcroft, partitions—Beechcroft clinker blocks; Kerner Greenwood & Co., Ltd., damp-proofing—Pudlo to inside of basement walls; Carter & Co., Ltd., tiles—internal and external frost-proof tiles in porch; Tentest Fibre Board Co., Ltd., roofing, insulation, Tentest fibre board; Frazzi, Ltd., Paropa roofing covering and paving in front of house; E. A. Higginson & Co., Ltd., all joinery and built-in fittings; Venesta, Ltd., doors, veneers; Everwear Floor Co., plywood floor in studio; Dryad Metalworks, Ltd., special fittings and door furniture, hat and coat rack in hall; Kiefer, Zurich, window furniture, special wooden windows; Evered & Co., Ltd., ventilators; Fredk. Braby & Co., Ltd., weatherings, ventilators, flashings, etc. Ideal Boilers and Radiators, Ltd., taps; Shanks & Co., Ltd., McAlpine & Co., Ltd., anti-siphonage traps; Kingsmill Metal Co., staircase handrail in metal, cellulosed; Holroyd (Glassware and Lighting), Ltd., electrical fittings; Radio Furniture and Fittings, Ltd., anti-static aerial; Wardle Engineering Co., Ltd., thermostats, Maxheat electric tubular heaters; Bratt Colbran, Ltd., special illuminated fire; Santon, Ltd., electric thermal storage water heaters; Pilkington Bros., Ltd., glass; H. and F. Badcock, Ltd., internal and external plaster; Cement Marketing Co., Ltd., special external rendering in two colours—Cullamix Tyrolean spray finish; Paripan, Ltd., paint; Walpamur, Ltd., distemper; Gordon Russell, Ltd., wallpapers and curtains; Kelvinator, Ltd., refrigeration; Waring and Gillow, Ltd., furniture, fabrics, carpets, door mats, chintz blinds in kitchen and bathroom; Edinburgh Weavers, Ltd., curtains; Betula, Ltd., furniture; Turnbull and Stockdale, Ltd., curtains; George Johnson, Ltd., hand power lifts; A. Johnson & Co., Ltd., Savestane sinks; Kandya, Ltd., glass cereal racks; Hotpoint Electric Appliance Co., Ltd., cooker; Garden Makers, Ltd., garden layout; John Russell, Ltd., plants; Noelite, Ltd., garden paving; Gent & Co., Ltd., kitchen bell (buzzer) and indicator; Heal and Son, Ltd., garden umbrella; Murphy Radio, Ltd., radio.