The Architects' Journal
December 27 1961 Vol 134 No 26 Price 1s

AJ

SfB (23)

This issue of the AJ should be filed as it contains part of a 50-part technical information library which the AJ is founding. Below are the most important elements from Table 1 of the SfB classification.

These are the key to our library production programme, and each week we publish, with the normal AJ, a supplement dealing with one of these elements. Headings in bold type are those dealt with in previous issues. This week's supplement covers part of SfB (23). The remaining headings will be published in subsequent issues.

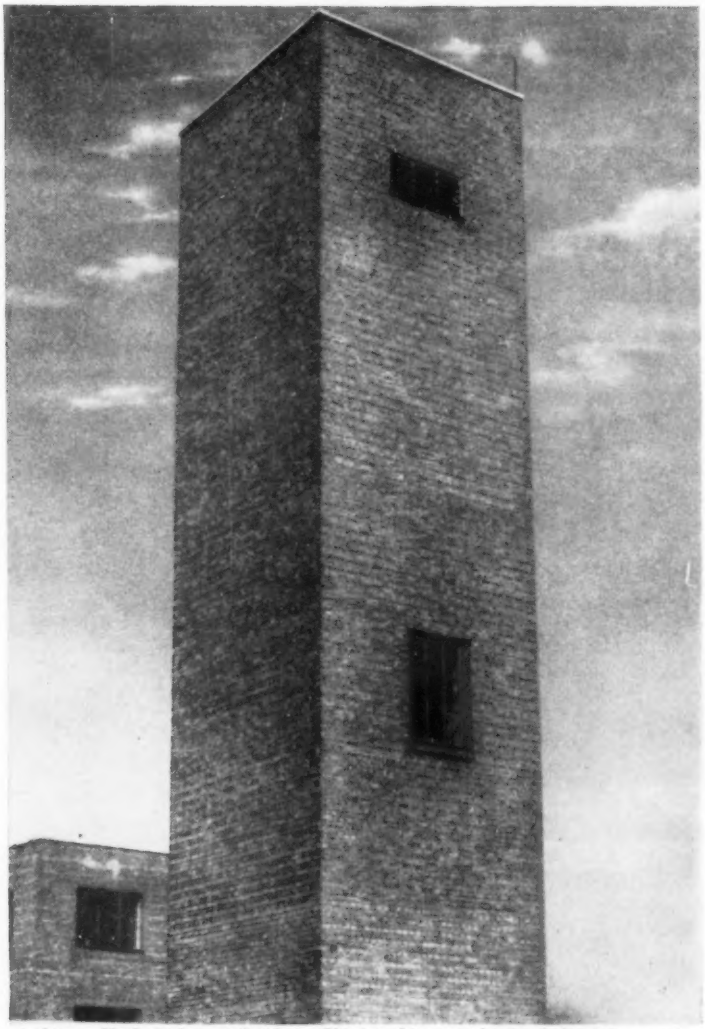
This is a token preclassified file cover for the Element File Technical Studies, Element Design Guide and Information Sheets within and for all subsequent articles and digests on these subjects which an architect needs to keep. At the end of a year readers will have a design manual covering all the functional elements listed below and forming the nucleus of a technical library.

(11) Ground: General
(12) Drainage: General
(13) Retaining structures: General
(14) Roads and pavings: General
(15) Garden: General
(15) Garden: Fences, gates, walls
(16)-(19) Foundations
(2) Structures: General
(2) Structures: Concrete: General
(2) Structures: Sections, metal
(2) Structures: Sections, wood
(21) Walls: External load-bearing: General
(21) Walls: External non-loadbearing: General
(22) Partitions: General

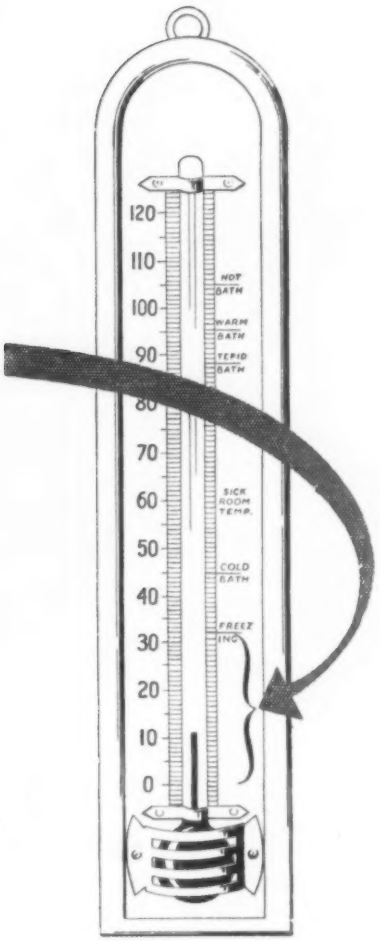
(23)
Floors, ground: General

(23) Floors, structural: General
(24) Stairs and ramps: General
(25) Ceilings, suspended: General
(26) Roofs, structural, flat: General
(27) Roofs, structural, pitched: General
(30) Accessories, ironmongery: General
(31) Windows: General
(31) Windows: Sections, metal
(31) Windows: Sections, wood
(32) Doors: General
(34) Handrails and balustrades: General
(37) Roof-lights and traps: General
(38) Roof eaves, verges, gutters, rails: General
(41) Finishes, external: General
(42) Finishes, internal: General
(43) Finishes, floor: General
(46) Finishes, flat roofs
(47) Finishes, pitched roofs: General
(51) Installations, refuse disposal: General
(52) Installations, drainage and sanitation: General
(53) Installations, water, hot and cold: General
(54) Installations, gas, compressed air, steam, refrigeration: General
(56) Installations, heating: General
(56) Installations, heating: Equipment and fuel
(57) Installations, ventilation, air-conditioning: General
(63) Installations, electrical: Lighting and power: General
(63) Installations, electrical: Lighting equipment
(64) Installations, communications: General
(66) Installations, mechanical: General
(68) Installations, special: General
(72) Rooms, fixtures and equipment: General (fixed furniture)
(72) Rooms, fixtures and equipment: General (loose furniture)
(73) Kitchens, fixtures and equipment: General
(74) Cloakrooms, bathrooms, lavatories, fixtures and equipment: General
(75) Laundries, fixtures and equipment: General

TOWERING ABOVE ALL



Architect: H. C. Bishop, A.R.I.B.A., Chief Architect to the Sunderland Corporation, Contractors: Messrs. R. Mathews Ltd., 25, Villiers Street, Sunderland.
The 63-ft. high Fire Observation and Practice Tower illustrated above was erected during the winter of 1955 56 (the coldest winter for ten years.) During erection, day temperatures varied from 55 deg. F. to 19 deg. F., with bricklaying work continuing without a break. Despite the repeated cycles of freezing and thawing that occurred throughout the erection period, the Tower is today sound, the mortar in perfect condition and the brickwork absolutely impervious. That this was possible was due to the careful supervision of the Contractors' Agent and the use of Febspeed Plus, the cement frost-proofing compound that towers above all others



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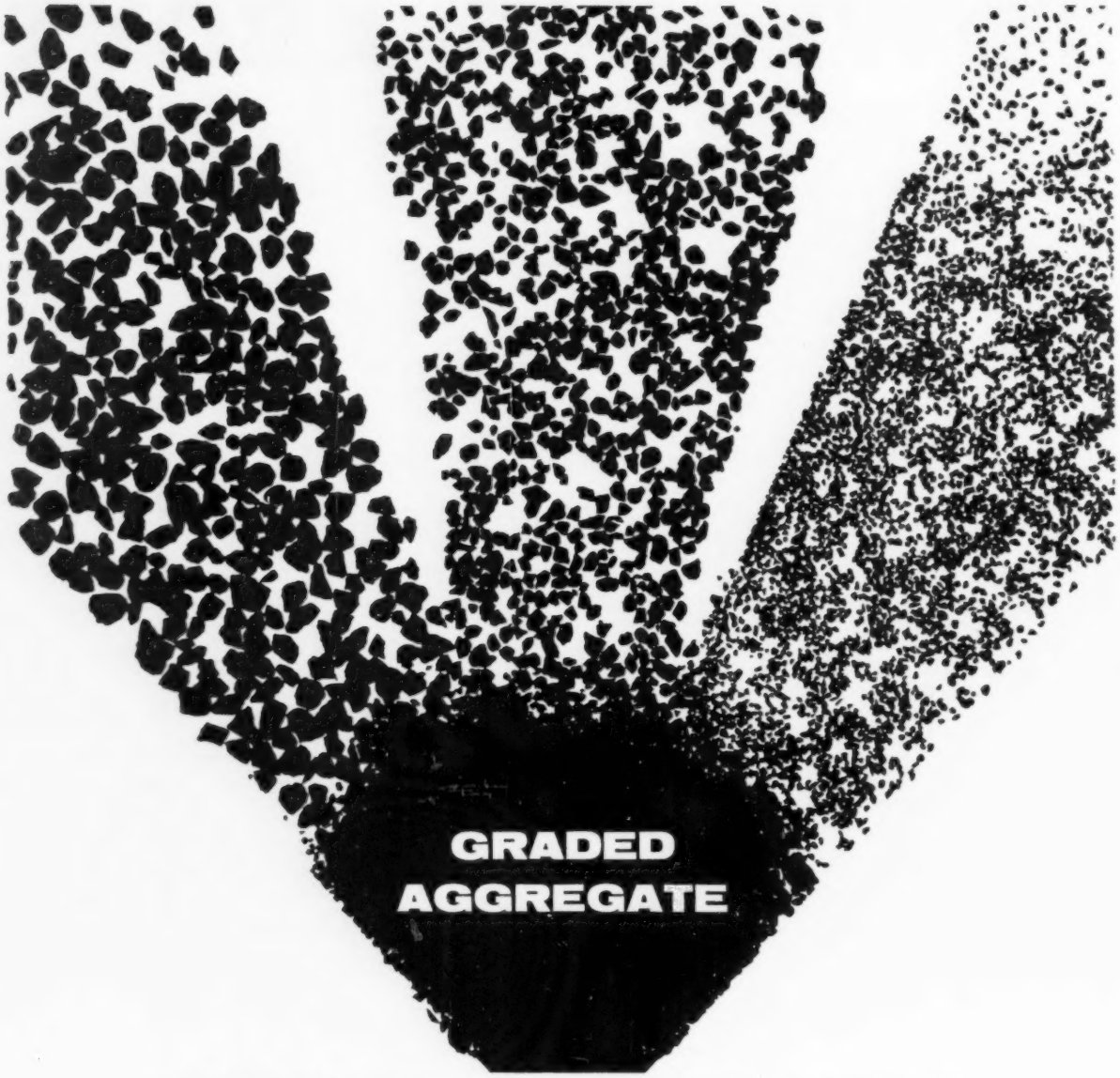

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Shieldfield Redevelopment 486 Multi Storey Flats | *Architect* G. Kenyon, Esq., Dip.Arch., A.R.I.B.A., Dip.T.P., A.M.T.P.I., City Architect, Newcastle Corporation. | *Contractor:* Leslie & Co., Ltd., 80 Woodlands Road, Darlington, Co. Durham.

IN CONTRAST with the old fashioned and dingy buildings of yester-year we illustrate here the modern way of living that comes from modern design and constructional methods.

A design for good living necessitates the use of good materials in erection and on this contract the Architect ensured that the brickwork had maximum durability by allowing the use of Febmix DeHydrated Mortar Plasticiser in the bricklaying mortar.

The Contractors also benefited because the improved plasticity and workability of the mortar speeded erection and the elimination of lime reduced material cost.

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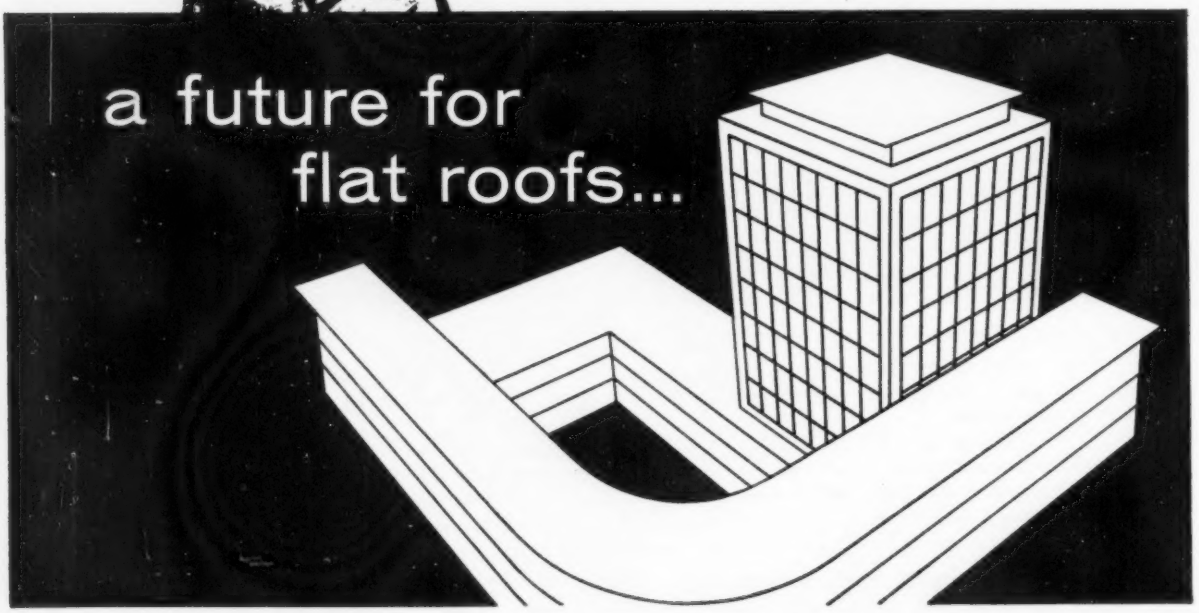

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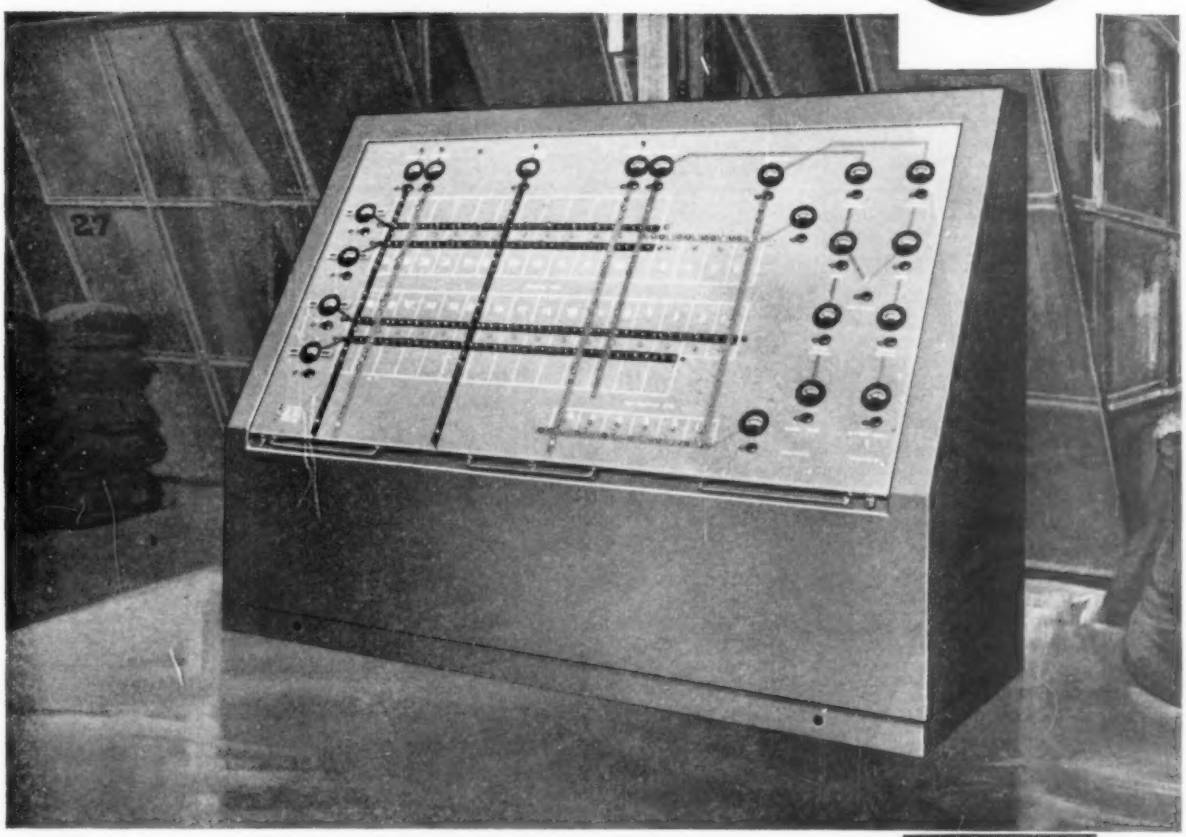
Bulk Storage Control Panel by...

MEM



The panel is designed to control a number of conveyors operating a bulk storage plant consisting of 33 bins of 7½ tons capacity each.

Each bin has a pneumatically operated slide controlled by a solenoid operated air valve, making it possible to route material from any intake position to any one of the bins.

The panel comprises contactors controlling the solenoid air valves and starters with ammeters for the conveyor motors, dust extractor, etc. Full electrical interlocking of the conveyors and various safety features have been incorporated in the control circuits.

The mimic diagram on the sloping front of the panel gives a clear indication of the state of the plant which extends over an eight storey building. The position of the 100 slides is shown by means of indicator lights. In the event of any dangerous condition arising, an alarm signal is sounded and visible warning is given by flashing lights showing the position of the blockage.

The circuit was developed in co-operation with Mr. G. S. Carr, A.M.I. Mech.E., A.M.I. Plant E., Chief Engineer of Messrs. Crosfields and Calthrop Ltd., manufacturers of animal and poultry foodstuffs.

MEM

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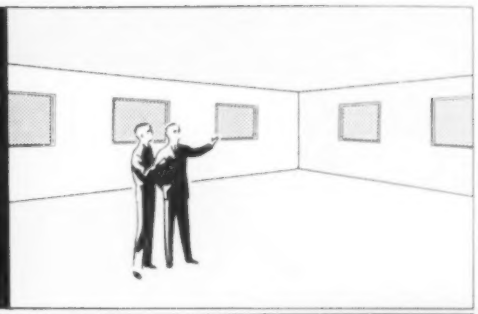

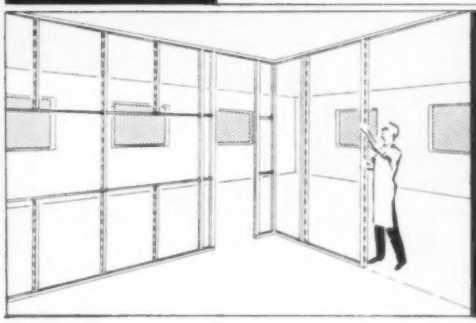

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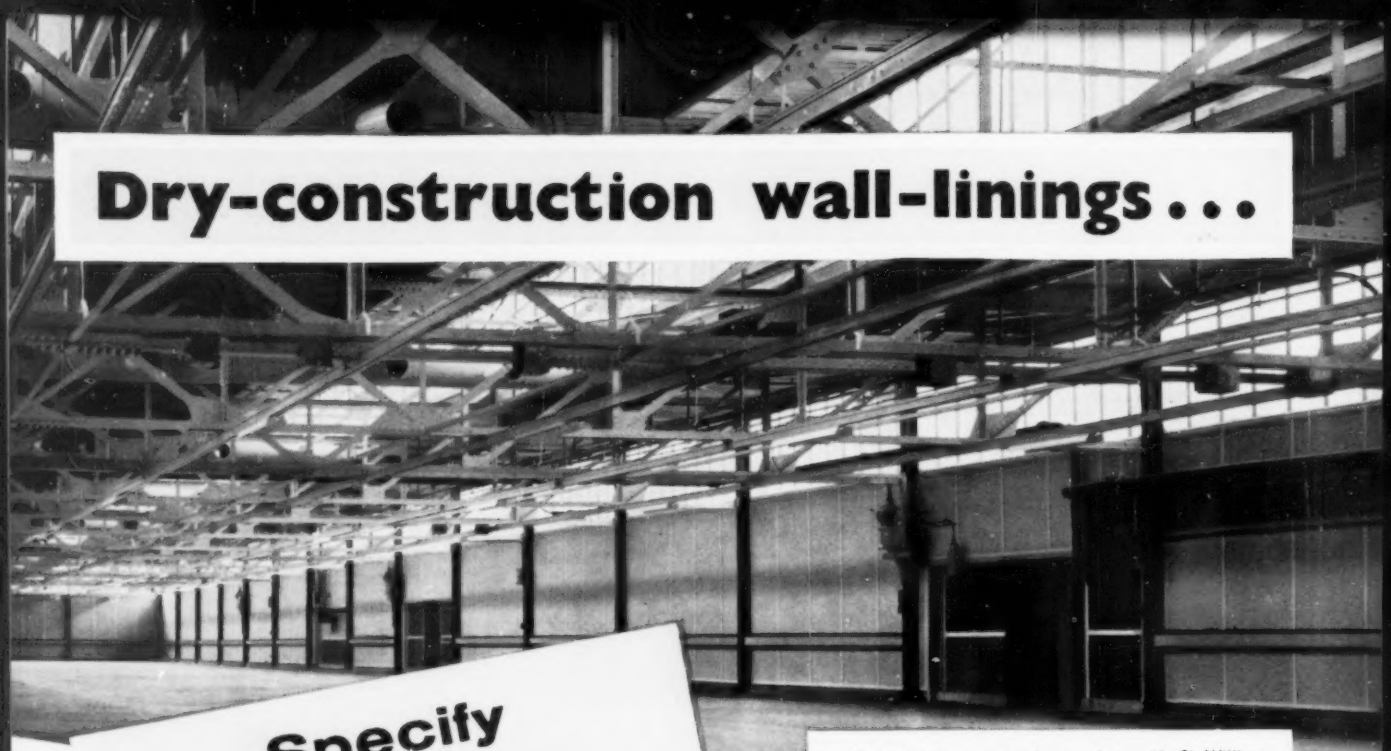

All walls in this open-plan factory, designed by Sir William Holford, P.R.I.B.A., M.T.P.I., for Jeremiah Ambler Ltd., are lined with STRAMIT insulating slabs.

Specify STRAMIT INSULATING SLABS

STRAMIT slabs in process of erection at a factory store for John White Ltd. of Northampton. The thermal conductivity of the wall was improved from 0.9 to 0.19.

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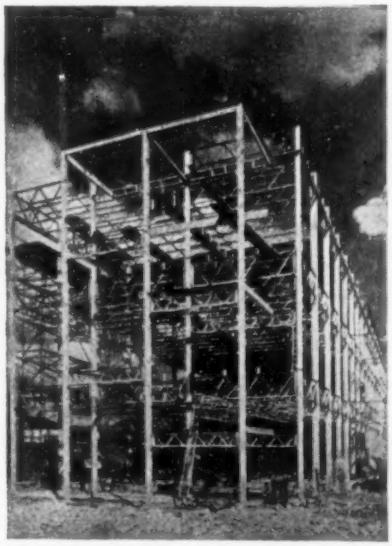
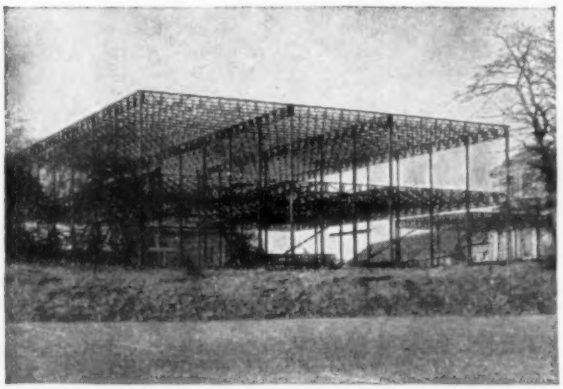
THE BOWATER PAPER CORPORATION LIMITED. The Architects for the new Office Blocks at both Mersey and Northfleet designed for Lattice Steelwork on a modular grid which allowed service lines to be run between floor and ceiling and gave complete flexibility for internal arrangements.
Architects: Messrs. Farmer & Dark.



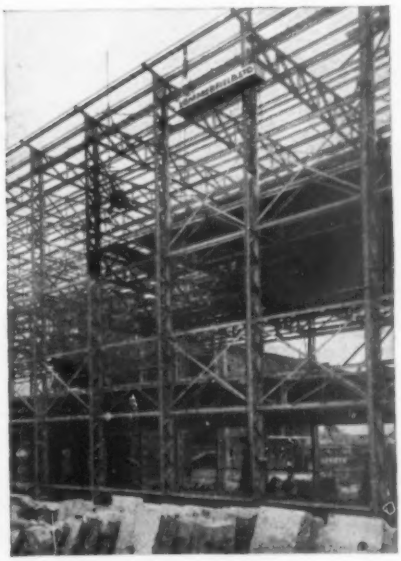
YORK. For the City of York a Grammar School. Sommerfelds designed the Steelwork on a 3ft. 4in. modular grid allowing complete freedom for the Architect to use curtain walling and internal arrangements.

Architect: E. Firth, F.R.I.B.A., A.M.T.P.I., City Architect.



B.E.A. For this B.E.A. Building, speed was the essence of the Contract. Sommerfelds designed the Steelwork and from unloading the first lorry on site to the completion of a 250 ton steelwork erection took three weeks.

General Contractors: Messrs. Richard Costain Limited



I.C.I. For I.C.I. a Laboratory Block. A multi-storey building with a height to eaves of 44ft. and uninterrupted spans of 50ft. on each floor. Deep Lattice Beams and light stanchions were used with considerable saving in steel requirements.
Architects: Messrs. J. Douglass Matthews & Partners.

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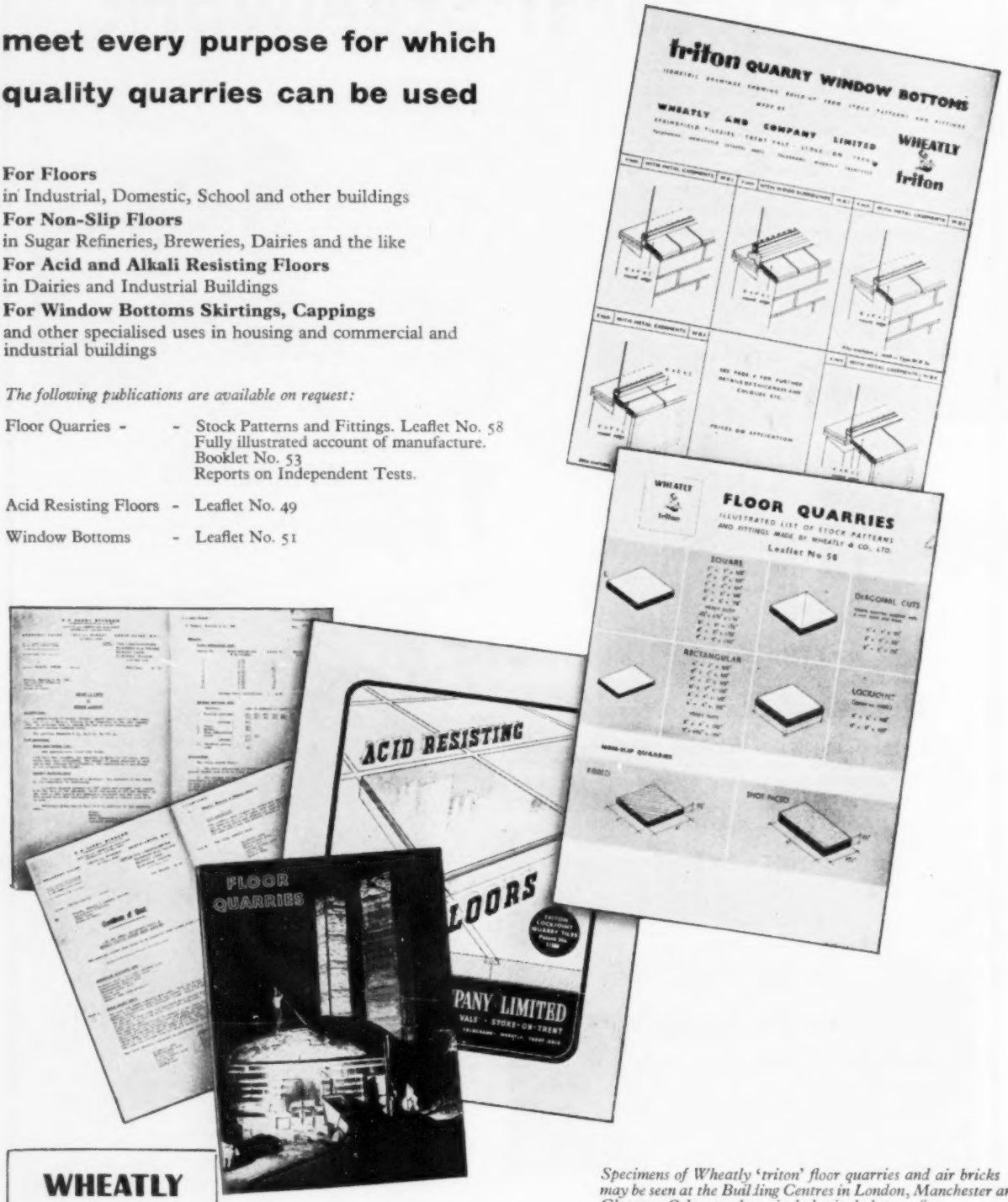
Acid Resisting Floors	-	Leaflet No. 49
Window Bottoms	-	Leaflet No. 51



Specimens of Wheatly 'triton' floor quarries and air bricks may be seen at the Building Centres in London, Manchester and Glasgow. Other products include single lap roofing tiles, ridge tiles (blue and red) and fireplace briquettes.

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AP 29

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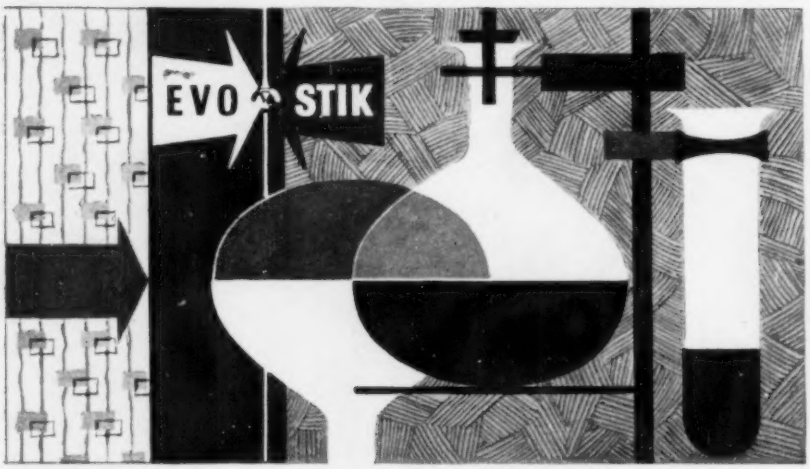

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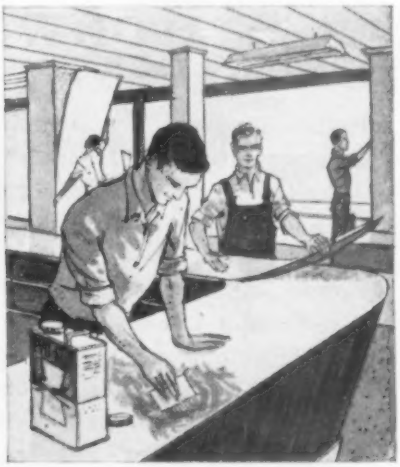

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There's something new beneath the counter of today's modern store. Softboards and hardboards permanently bonded with Evo-Stik; and decorative surfaces for counter tops, display fittings and shelves bonded again to these materials. Over the last few years, our chemists, coupled with technical advisers in the field, have found Evo-Stik Adhesives filling every requirement better and quicker. Helping to keep building and woodworking costs lower by adhesives which overcome a diversity of your special problems.

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Hornitex

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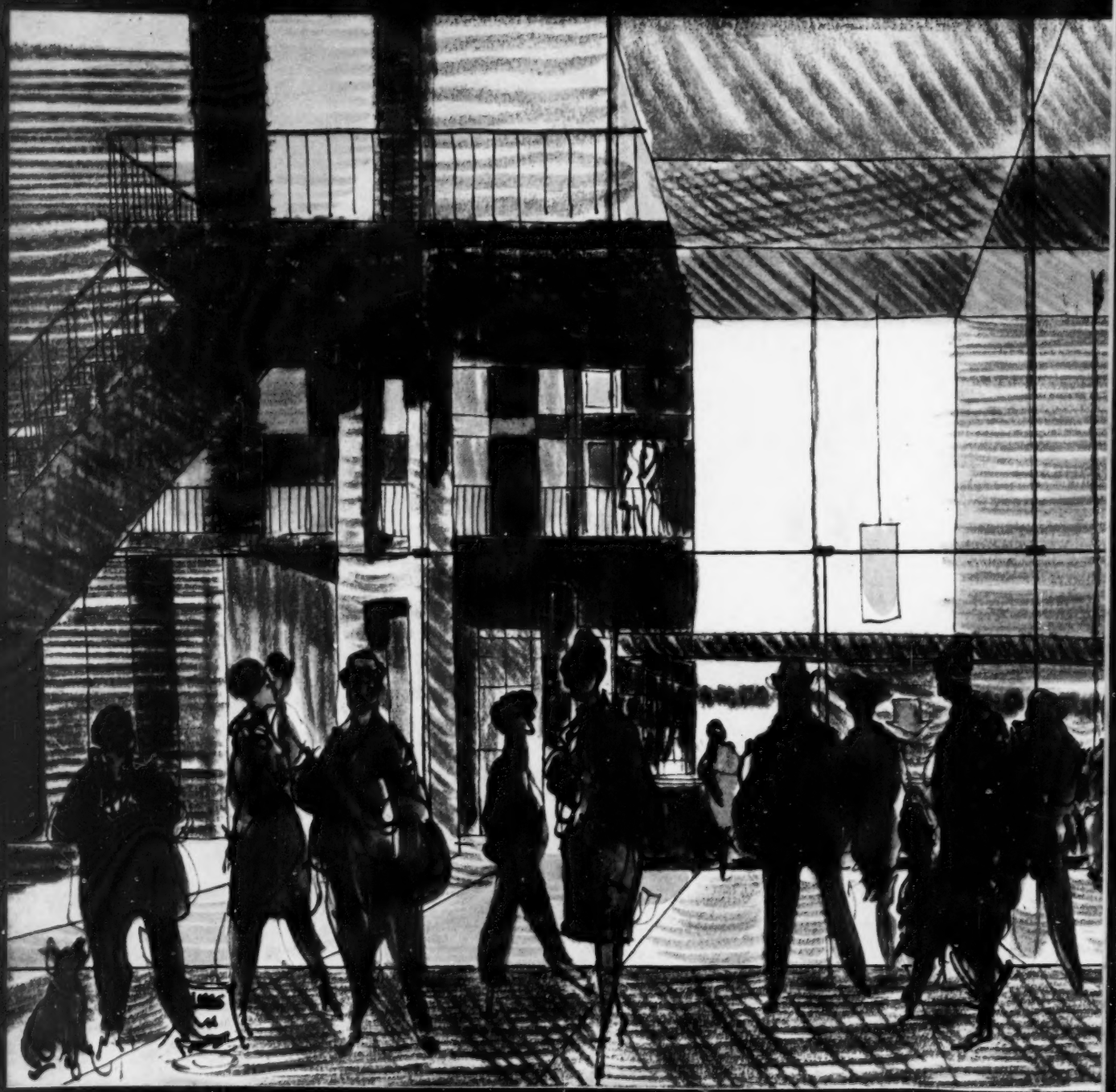

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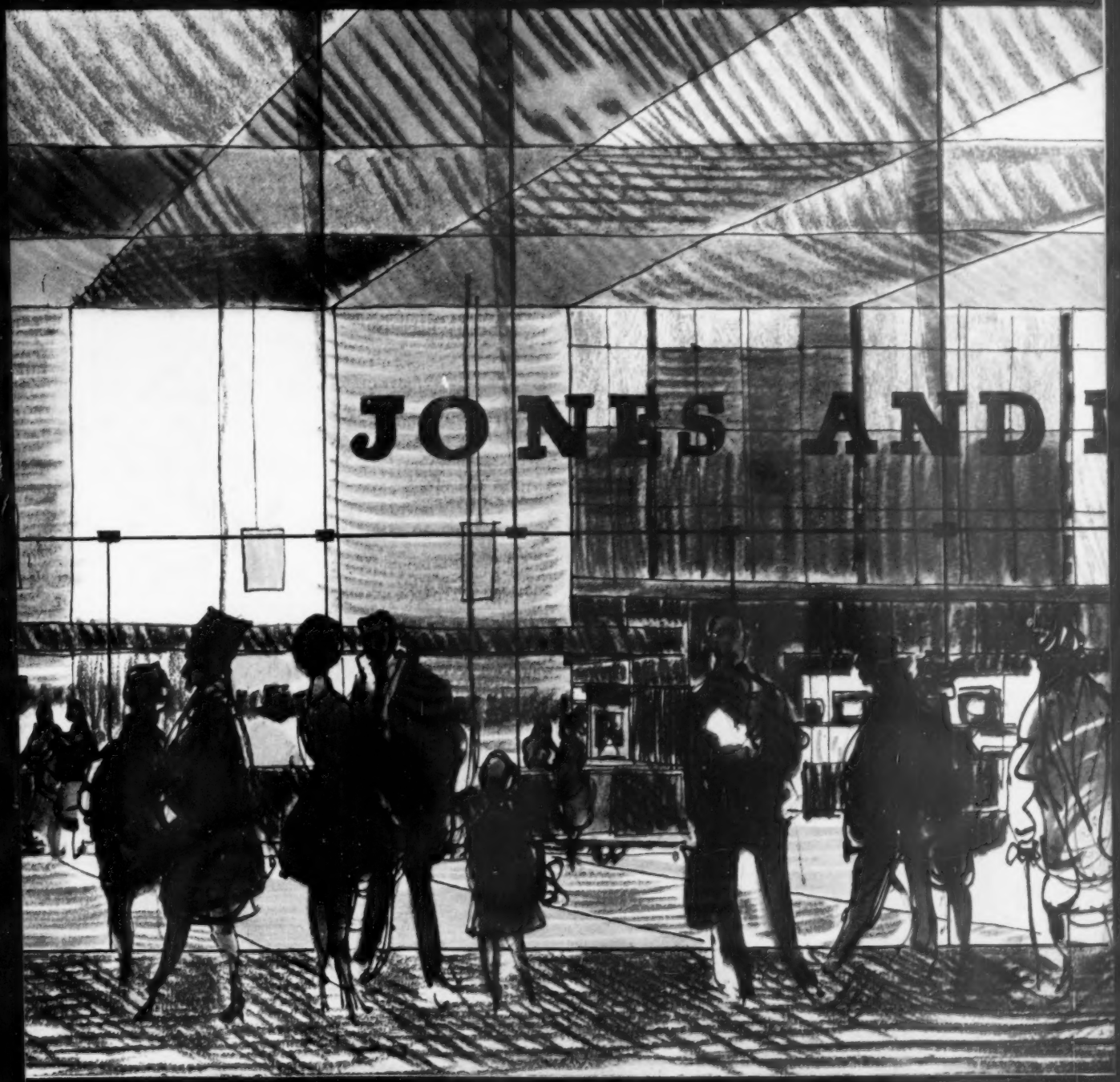

With Pilkingtons'

'Armourplate'

Glass Assemblies

A new way with wood–

Panelling featured here is random-planked Knotty Pine

BUILD AND MAKE BEAUTIFUL with SEABOARD DECORATIVE PLYWOOD

No plastering or decorating was needed to create this elegant interior because the walls were actually built from Seaboard Decorative Plywoods

Seaboard Plywood is tough and durable and its phenolic glue bonding is completely waterproof. The standard 8′ x 4′ panels are easy to handle and quick to erect. Rooms panelled with plywood are easier to heat because its surface temperature rises twice as quickly as that of plaster.

Seaboard offers a wide range of decorative plywoods in distinctive patterns and grains, pre-finished or natural. With most types, the joints between panels are completely concealed by the repeating pattern.

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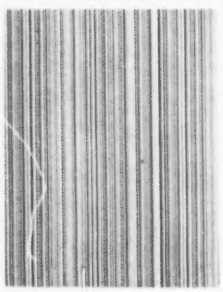

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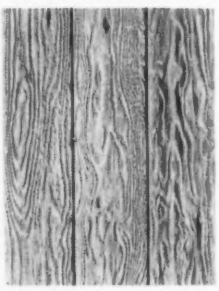

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Barbour Index 143

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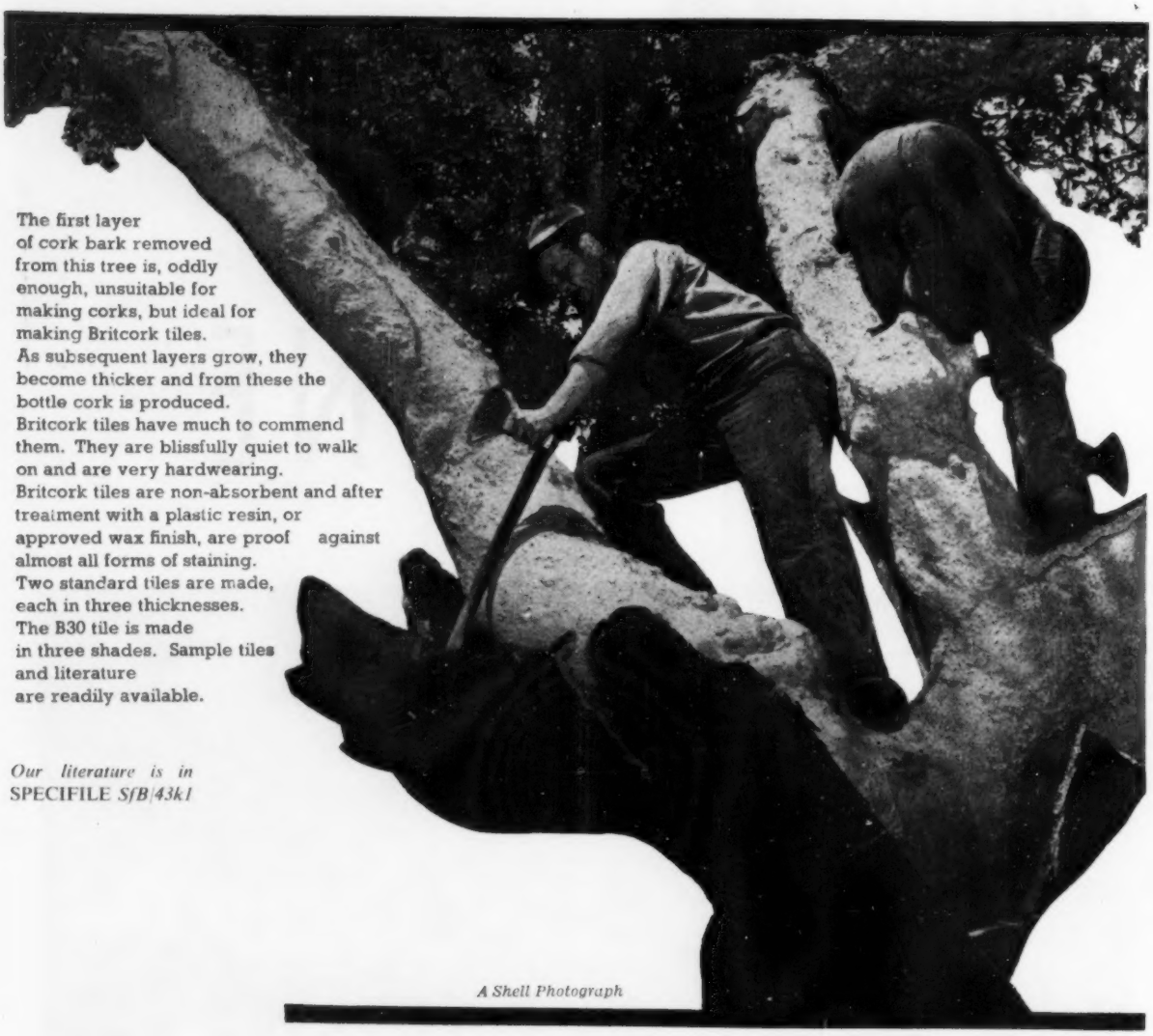

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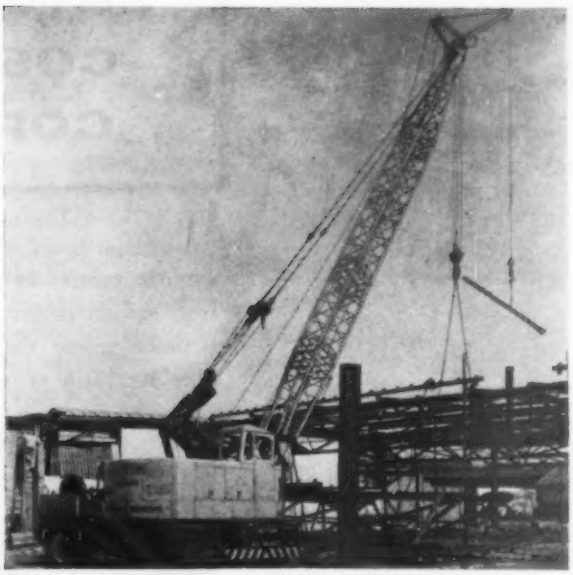

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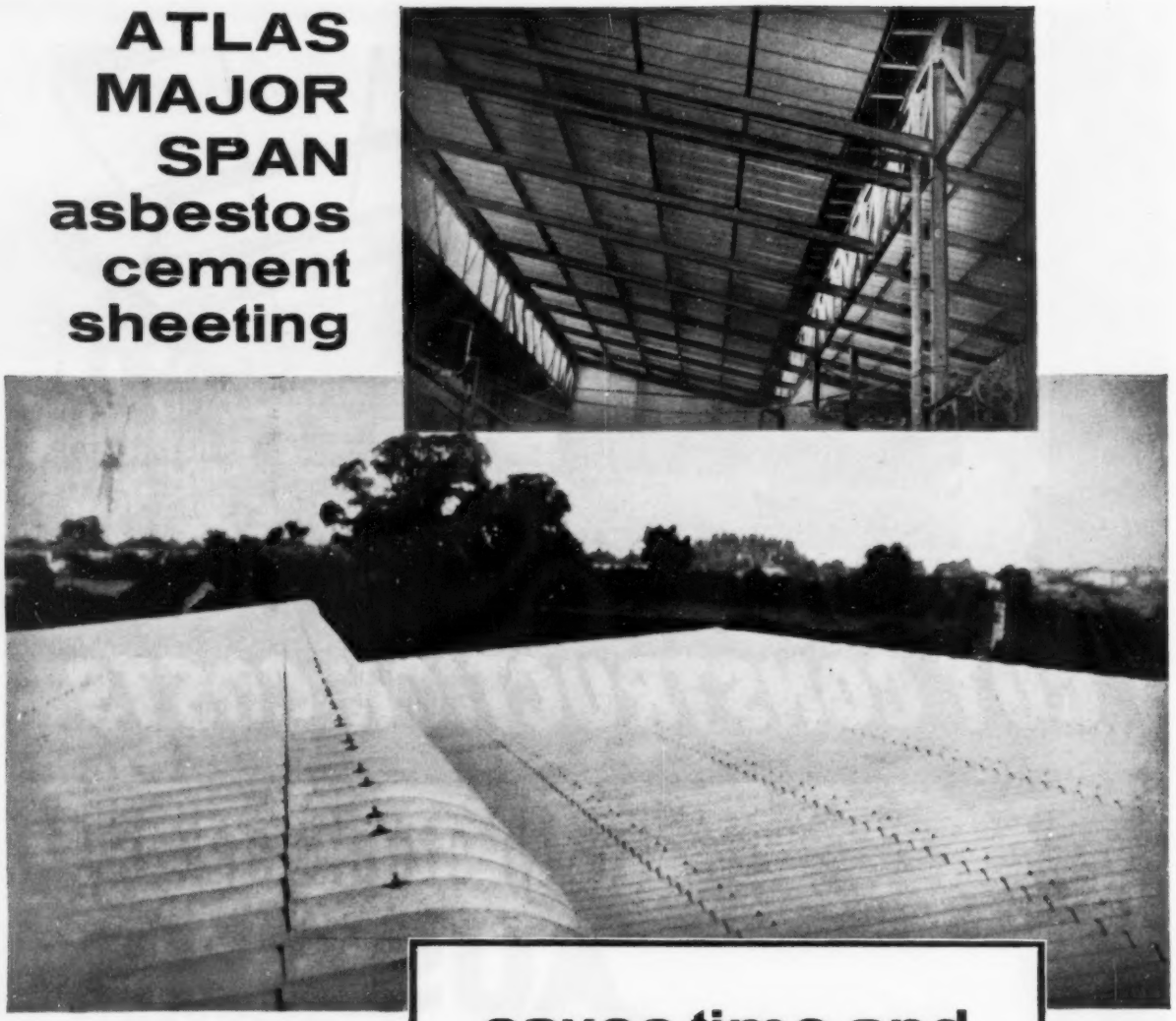

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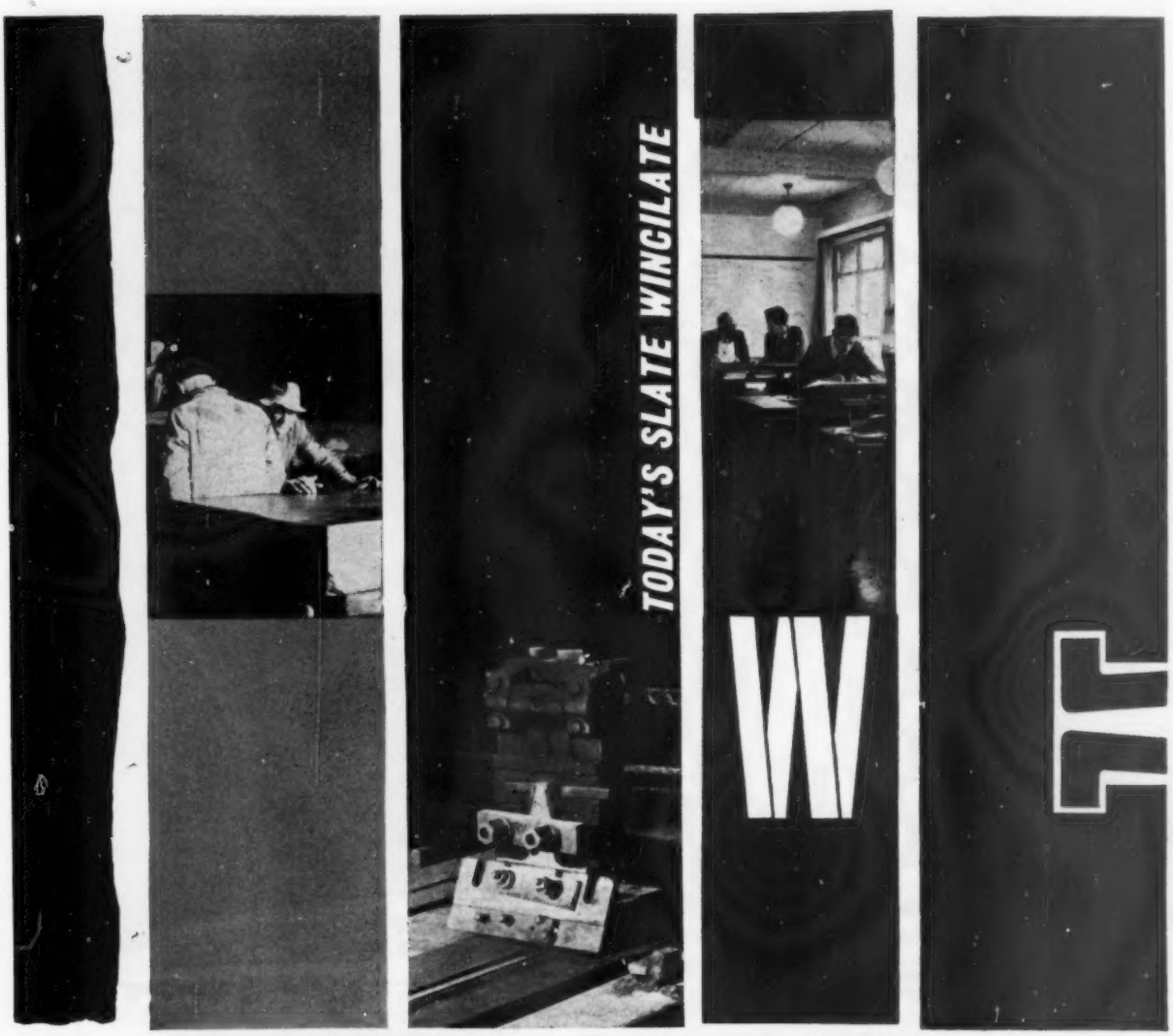

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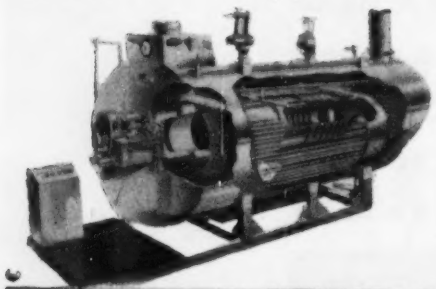

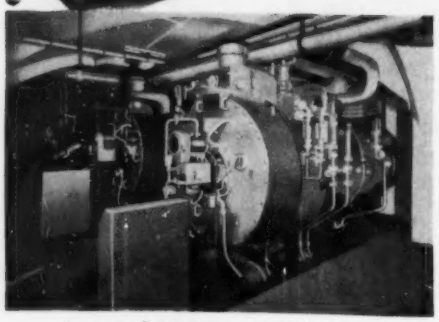

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The Architects' Journal

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NOT QUITE ARCHITECTURE

Survivor from Buildex

I washed, shaved and peeled off skin-tight jeans. A haircut, a tweed suit, sober shoes and a brief-case completed my Brummagen appearance. Ah! yes, and my colleague's rolled umbrella. He's studying medicine.

Did I now look the architect I wasn't rather than the student I was? I hoped so—it's easier extracting information at the Building Exhibition when you're qualified.

Suavely, I sauntered into the Olympian Hall and started ferreting.

Salesman No 1 approached me, his face shining and cavitied like a new walnut, his breath smelling like an old one. He leered—or did he grin?—and jabbing me in the ribs muttered: "You in the trade too, mate?"

I hurried on—deflated.

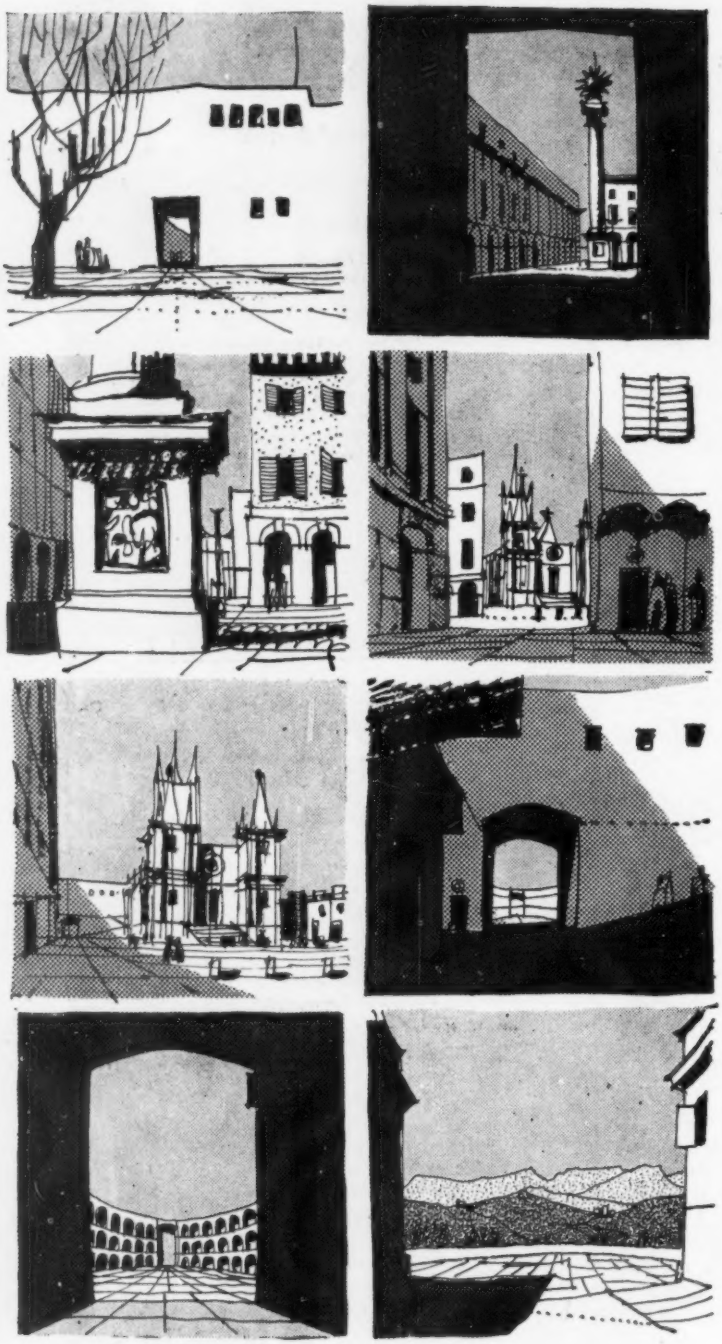
Salesman No 2 was charming and sweetly odoured. "Just haven't a fag paper of information that would suit *you*, old chap. Stuff here's far too pretty, you know, eh? Tell you what, though, I'll nip round your office next week with some technical dope and give you a bit of lunch too. If you've got your card I'll take. . . ."

My smile froze. With sweat-wet hands I waved to my non-existent father in the crowd and excused myself clumsily.

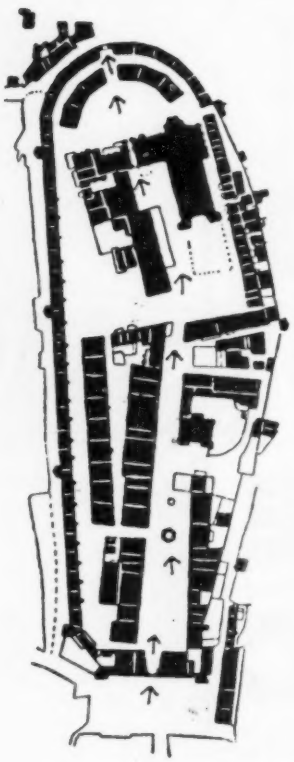
I hurried on embarrassed.

Salesman No 3 was small, old, cynical and selling acoustic tiles. "You're wasting your time, lad," he murmured unemotionally as I pecked my way through his literature. "Frankly, you'd be better

CASEBOOK: SERIAL VISION



To walk from one end of the plan to another, at a uniform pace, will provide a sequence of revelations which are suggested in the serial drawings opposite, reading from left to right. Each arrow on the plan represents a drawing. The even progress of travel is illuminated by a series of sudden contrasts and so an impact is made on the eye, bringing the plan to life (like nudging a man who is going to sleep in church). My drawings bear no relation to the place itself; I chose it because it seemed an evocative plan. Note that the slightest deviation in alignment and quite small variations in projections or setbacks on plan have a disproportionally powerful effect in the third dimension.



Serial vision, place and content

When historians come to record the development of architecture, landscape architecture, and planning in the mid-twentieth century, it is interesting to speculate whether they will give the credit that is due to the unsung genius, Gordon Cullen, the artist who, starting by giving graphic form to the ideas of the *Architectural Review* editors, has ended by largely creating the art of townscape. His contribution can be assessed by studying the book *Townscape* (published by The Architectural Press, 56s) in which he describes with poetic sensitivity, and illustrates with photographs and his own superb drawings, the whole, newly-rediscovered range of effects which is available to the planner. Most of the material is based on articles by Cullen which have appeared in the *Architectural Review*. But here at last, within one volume, is the essence of the art of planning which architects and planners, and all clients and committee men who would claim to be in any degree civilised, must read and absorb. It is the townscapist's primer, the first, carefully spelled out lessons in the art of creating a stimulating and vital urban environment from the mundane land uses and buildings which we describe as 'development.' A typical page from the book is shown above. This volume should have first call on any book tokens received at Christmas.

off with a carpet than this stuff. Still," he added reflectively, "if you want it, take it!"

I left surprised.

At this stage a colleague swept past me in an agony of haste clearly indicating that he was in search of the place which is always at the opposite end of the hall.

On a kitchen stand Salesman No 4 showed me a foldable sink unit. Intrigued to know what possible advantage it could have, I asked. His doubtful answer of "speedy erection on site" was followed by a mumble of "if you are . . . away . . weekends by the sea . . . moving house . . ." his words tailed off sadly and I hurried on unconvinced.

Salesman No 5 was demonstrating spotted paint. I looked round—looked again. Yes, it *was* SPOTTED PAINT.

I hurried on.

Salesman No 6 was from America. He was laconic, efficient and obliging. In thirty seconds he had mentioned the product he was selling, given me a handout and was on to a discussion about American breakfasts. It seems that bacon and egg in the States is "always larded up with jam and other such goddam-awful trash!"

His answer to my question "Why have you adopted England as your new home?" was as refreshing as it was original.

"Jeez, mac'—I ain't paying no 6,000 dollars on a casket when I cash in. I'll stay here and settle for a Union Jack and a pinewood box, anyday!"

My colleague wandered past me again, looking as if he had just been awarded a distinction in his thesis.

*

Salesman No 7 when asked for literature relative to his product, went purple in the face, glowered frighteningly and through gritted teeth, snarled: ". . . none left—thanks to those (Lady Chatterley word) little bastards who run around the place all day!"

I asked Salesman No 8 if there was any inherent danger in the sliding glass doors of kitchen units fixed at high level. I've often feared the incline of the front might encourage broken glass to scythe down and lay one's cheek open. The man replied stiffly, "We would always replace the glass, sir."

As I walked along one gangway, a tall, friendly looking man, who appeared wonderfully inoffensive, turned angrily on Salesman No 9 and mouthed with a great deal of control: "No, for God's sake—I'm just browsing!"

By now physically and mentally tired, dry-mouthed and suffering from a headache I turned towards the lift.

Salesman No 10 was drawing a large crowd with a Petticoat Lane type patter. He was expounding the virtues of a glass-cutter-cum-sharpener-cum, goodness knows what. "Why," he yelled, waving the thing above his head, "it's so bloody simple even women *and* architects can use it."

DEREK C. HALL

The Editors

ARCHITECTS AT RISK

Several speakers at the discussion following J. P. Eddy's lecture on the professional responsibility of the architect at the RIBA on December 27 (reported on p. 1276) pointed out the steep rise in the number of claims for negligence against architects. This happens, not because architects are more negligent than they used to be, but because the public at large is more claims conscious, less inhibited about putting a professional man on the carpet.

As this is so, we are glad to hear that the RIBA is negotiating a special indemnity insurance for architects. Two points occur to us. First, it is important that architects should be covered against legal costs incurred *outside* the courts. In a recent case an architect had to pay heavy costs to secure legal representation at a Ministry inquiry. He subsequently found that he could not claim for these from his insurance company because the costs were not incurred in the courts. This seems an avoidable anomaly against which all should be protected.

Second, there is the general point that, in the end, professional responsibility is largely a technical matter. There is no substitute for personal care, but care can be fruitless if it is not allied to a sufficient method. Architects at present feel insecure because they realise that however careful they are as individuals they have not always either the knowledge or the control over circumstances which the public has the right to expect. This situation suggests that we should make a careful review of everything the architect does to see just where the public's expectations exceed reality. Mr Eddy implied that though an architect might not be 'grossly negligent' in the light of the standards of the day, he might still be grossly negligent in an absolute sense, because the standards were not up to the public's reasonable expectations. Although architects would be wise to see that the public does not expect more of them than they can give, they must not be too quick to limit their responsibilities, for then the public will turn round and say that architects are less important than they pretend and pay them even less for their services.

IN THE VAN OF VANBRUGH

Even the nonsense was exceptionally high-class stuff (writes my Scholarly Spy) at the AA's first follow-up to an RIBA meeting, Oliver Cox, the witty and concise chairman, gave a masterly re-cap of the original lectures by Nikolaus Pevsner (on historicising "modernists") and Reyner Banham (on things to come). It was a pity that few speakers paid much attention to this summary and that so few seemed to realise the talks were complementary. Pevsner showed the impasse: Banham tried to show a way out.

*

There is bound to be historicising today (my Spy continues) when there is so much instability and uncertainty, and obsolete trends from the early period of the modern movement crop up as mannerisms. That is what saddens Pevsner, who calls it historicism. Banham realises that art today exists on the fringes of the life of society, and it is in the social sciences that he sees a new outlook for architects. James Cubitt was provoked by all this to attack "architectural attitudes" (in the best contribution of the evening) and Robert Furneaux Jordan made the astonishing remark that "Bill Howell and his gang are the Vanbrughs of our day."

NEVER SAY DIOCESAN

The LCC tells me *The Daily Telegraph* was wrong in saying that planning permission had been granted for the conversion of Britain's best baroque church, St John's, Smith Square, by "the husband and wife team of Stewart and Shirley Thomson." Good. I can't imagine how this ill-thought-out scheme could possibly cram so much on to the site—art gallery, theatre and hall, as well as a garage for 300 cars in the sturdy, brick-arched crypt which supports the building. I hope the interested people who backed the project (to be dedicated, it is rumoured, to Sir Winston) will have to think again. Their scheme would thrust a new roof on to Thomas Archer's beautiful baroque exterior. (This would have been better preserved in an earlier project put forward for a concert hall.) The LCC, I'm glad to hear, want the building restored, but the London Diocese seems more interested in money.

FUN DEVELOPING

I suppose it had to happen. At last we have a British film in which the villain is a fat, grasping building developer. The film is a musical, *The Young Ones* (Warner), and the "young ones" in the title are members of a youth club who are determined to stop Robert Morley—a real pantomime villain with a kind heart—from putting up offices on the site of their headquarters. Nothing—not even the discovery of a legal snag—will stop Mr Morley, who is seen in one delicious shot making up his mind whether to put a Greek temple tank tower on his office model or a "contemporary" slab. "Everyone wants offices," he says greedily: "they breed like rabbits." The Message of the piece comes when a youth club member threatens to hire hoodlums to "go over" Mr Morley. That, he is told, would be violence—and to be violent is worse than being a large-scale speculator. A nice debatable point: do bicycle chains really leave deeper scars than the claws of high finance?

STOREYS WITH HAPPY ENDINGS

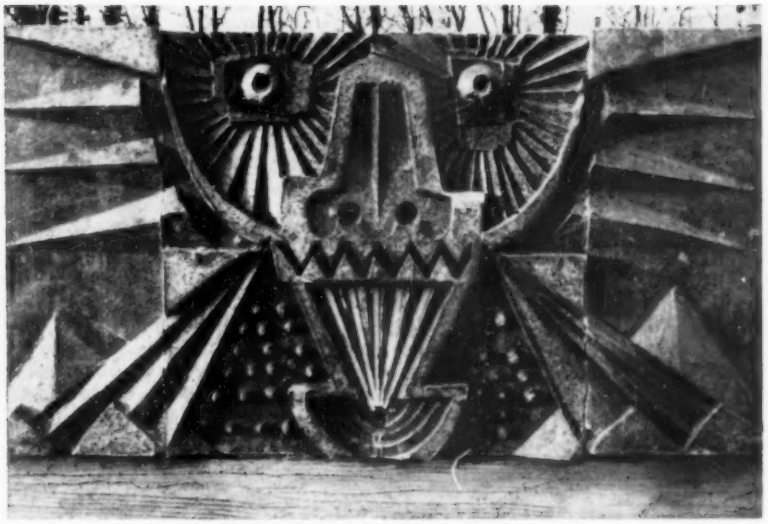
After our own dismal failure to preserve Euston Arch I'm glad to hear that *some* preservationists are successful. The Chicago Heritage Committee has been doing some good work preventing the early skyscrapers being pulled down. The Committee has an appeal out for funds and has issued a set of postcard views of noteworthy buildings of the Sullivan, Burnham, Holabird epoch. And the congregation at Unity Temple have just completed a restoration of the church and put it back almost exactly to Wright's original design. Not all the luck that has fallen on Wright's work has been unqualified in its goodness, however. The restoration that William Zeckendorf's men have done to the Robie House, for instance, comes within the class that Niall Montgomery once called "correct in everything but the details."

JMR ON LCC

The implications of dismantling the LCC are only beginning to be seriously considered, after the publication of a very brief White Paper on the future of government in Greater London, so J. M. Richards' talk on this subject on the Third Programme this Saturday (December 30) should be well worth switching on. Last time I heard him give a Third Programme talk, on the implications of the motor-car, his points came across admirably clearly, so I hope he can unravel the complexities of what is proposed for London.

NO NEWS OF THE BOAT RACE?

Chelsea, Wimbledon and Ascot all have their set places in the calendar. But the *Daily Mail*'s jamboree in Hammersmith Road — like Guy Fawkes and Father Christmas—creeps back earlier each year. Ideal Homes are now publicised even before Christmas, and with less justification every time. Still, some of you may like to make a note in your brand-new diaries that it will certainly be worth missing the "House in the Sun," furnished for Sir Malcolm Sargent, whose living room will be filled with "old-fashioned articles of all kinds," Stirling Moss who, it seems, sleeps like a top person and opens his garage door electronically from his bed, and Valerie



Visitors to Harlow New Town will probably think they have stumbled upon some Aztec rock carvings when they see the decorated retaining wall of one of the pools in the water garden. The garden, behind the shopping centre, contains three pools and the water flows between two of them through the eyes, nose and mouth of the demon pictured above. This is one of a row of seven gargoyles all of which are monolithic blocks of concrete poured onto polyurethane deeply sculptured by W. G. Mitchell. Mitchell, who is one of the LCC's two consultants in decorative design, was recommended to Harlow Development Corporation Architect-Planner's Department by Frederick Gibberd. It would be interesting to know how Harlow children respond to such powerfully grotesque ornaments. But when water is gushing from the gargoyle's eyes, nose and mouth the sculpture may well acquire a more sympathetic character.

Hobson, "considerably removed from the orthodox kitchen one sees."

STRICTLY FOR HIGH OFFICE

London architects, who think of Ryman's as the shop round the corner where you get ball-pen refills, rubber bands and unlikely sizes of envelopes, ought to take a look at the branch in Dover Street. This is becoming the place you can go to for office furniture you couldn't see anywhere else. Scattered amongst their "Formation" desks are some aluminium-framed seats from the American "Multalum" range, with just the right air of grey-flannel efficiency for firms who occupy curtain-walled office blocks because they admire Lever House. Other pieces are vastly luxurious (but not vastly expensive), reassuring massive and visibly status-enhancing. Next month I shall drop in for some wishful sitting in the "Swiss Design" range.

CIRCUIT AND SEE

Which? has followed up its observations on gas cookers with a study of electrical ones. I won't tell you what model gained its "best-buy" rating: join and find out, and when enough of you have joined, Consumers' Association will be able to afford to do the fundamental research on functional suitability that I asked for when I discussed the gas cooker study.

The same issue also surveys a field that will be densely populated with architects this week—model racing car circuits. There seems to be a high degree of uselessness among the makes available, and the two choices are precisely those that an intelligent parent would probably buy anyhow. (Though the study of the cars themselves made no reference to this season's status symbol; steering front wheels.) But having seen one of these toys assembled almost without guidance by a six-year-old I can't think why *Which?* refers to the circuits as suitable for the twelve-to-sixteens.

HAVE PENCIL, WILL TRAVEL

No one, you will be appalled to hear, has made a thorough study of the Amber Palace of Jaipur. Eight members of the RWA School at Bristol will therefore set off for the Himalayas this summer armed with pencils, cameras and—they hope—a loan of £1,000 which they intend to pay back after selling articles and photographs. Behind them is the support of Professor Codrington, of London University's Institute of Archaeology and Sir Mortimer Wheeler, as well as a whole lot of qualifications—ranging from sub-aqua clubmanship to a prize-winning essay on apartheid. Excuse me while I flex my flabby muscles.

JERRY BUILDS AGAIN

BBC's *Tonight* team did a good job recently by drawing attention to a startling example of jerry-building and naming the builder concerned. Apart from wall cracks you could see through and floorboards with t's shrunken out of the g's (inevitable with central heating, said the builder), there were unconnected plumbing systems and a complete absence of the manholes required by the by-laws. One thing *Tonight* did not find out: how on earth did the local authority ever come to issue certificates of habitation?

DON'T BE SO FUNNY

Do *you* ever take much notice of the manufacturers who advertise with jokes and gimmicks? F. R. S. Yorke tells me his office loses all confidence in a firm when it produces such prestige ads. If a large, successful and progressive office like that of Yorke, Rosenberg and Mardall feels this way manufacturers might do well to heed the warning. They should also take note of a suggestion made at the Building Exhibition conference on technical information that the quickest, cheapest and easiest way to get an architect's interest is to instruct advertising agents to produce informative, A4-sized advertisements.

ASTRAGAL

LETTERS

J. Brunton, DipArch, ARIBA

B. Bednarczyk

C. Lunn, ARIBA

SfB

SIR: I was surprised at the undertone of arrogance in the Technical Editor's comment on my letter (AJ 22.11.61). It certainly is not crucial to the success of SfB that it should follow the architect's thought sequence, because SfB is not the architect's private tool. It belongs to the whole industry among whom the architect is numerically a minority. The success of SfB depends upon its adoption as a working tool, and not as a thought aid for architects; to suggest otherwise is to damage the SfB cause.

I would emphasise that the time concept is not a contention of mine, it is implicit in the system. The decision to "alter" the sequence was not made by the RIBA but by the IBCC at international level, in fact any alteration as such can be directly attributed to the publication in AJ 17.9.59.

It may well be that architects design from a building type through the element to the product, but this is the reverse of the building process and the SfB sequence. It is ludicrous to imply that the AJ version of the system (AJ 17.9.59 and 27.9.61) reflects the design process since no architect starts his design from external works and foundations.

To the majority in the industry, building is an additive process, and it is rational that this should be reflected in its classification system. Egil Nicklin, the SfB Committee chairman, in the introductory notes to the SfB system published by Svensk Byggjanst, defined that "by the act of their installation in the building, all products automatically became building elements . . . this particularly applies in the case of components; for instance a door is a building product (a particular component) when it arrives at the building site, but after installation it is a building element." It is unfortunate that this definition was omitted from the RIBA FILING MANUAL, but a study of the alphabetic index will show that this definition is still vital to the system. A brick, therefore, is not a wall until installed, any more than a floor tile is a floor finish.

If chaos is to be avoided, it is essential that all originators of preclassified information should use the standard authoritative system according to the standard conventions. The AJ as an originator should follow suit, unless they make it clear that their elemental emphasis is an 'individual mis-use' arising from their proposals for a specialised application to suit the architect's design process. In my opinion the AJ cannot promote the SfB on one hand and misuse it on the other, unless they say so and why.

J. BRUNTON
London SE12

We are sorry that Mr Brunton was able to discern an "undertone of arrogance" in our reply to his letter. This must have been the unintentional result of trying to put a fundamental view tersely. SfB is, indeed, for everyone in the industry; in the end it must serve everyone's purpose as well as possible. Our primary concern is that it should serve the architect as well as possible. We agree that he is in a minority among the users of the system, but we believe that he has a much larger stake in the system than the other users. This arises because the architect is the chief decision maker in the industry. Because of this it is in everybody's interest that his decision making should be made as easy and foolproof as possible. For most of these other users, the chief value of SfB lies in the fact that it is a commonly accepted system. For the architect, however, the actual form of the system is of immense importance, not only because it will make his own decisions easier or harder to reach, but because a classification exerts a profound influence on the way people think. The architect thinks "functionally" that is, he is less interested in items of construction for what they are than for what they do. Therefore his interest in SfB is represented primarily by the Functional Elements and Building Types. Our present view (which we are always prepared to change if sufficient reasons are given) is that when other factors are equal, function should be given preference to construction or material. It is in this, and not in a time sense, that elements should come "before" construction, for it is much less important that the actual order of the tables should reflect the order of the design process than that the information gathered under each heading should assist the design process. —THE EDITORS.

Professional qualifications

SIR: In view of the new RIBA (BAE) requirements for the entry to professional studies, and the Privy Council consideration of the by-laws for the revised Charter, I wonder if the terms student RIBA or RIBA inter could be reconsidered and brought into line with university degrees and other professional qualifications?

From many points of view it would be advantageous if the RIBA intermediate exam could be equated to the BA or BSc and the final to the MA or MSc in make and academic status. Some universities already grant a BA which the RIBA recognises as being of inter standard.

It seems unfair that a sixth-former after three years' study should only be called a student while his fellows with BA or BSc degrees, which took them as long even if they were not as hard to get, have recognised academic status. The Welsh Society of Architects gives the name of associate to those who have passed RIBA inter. Further, if a distinction is drawn between the study of architecture as an academic subject and as a practical profession with emphasis on an academic introduction in the first three years and a practical introduction to site and labour organisation, dealing with buildings and associated professions, and the statutory duties and privileges of architects, those who are interested academically may leave after three years without suffering as their degree will be recognised by universities and professions. At present the RIBA inter has no such recognition. A student of engineering or science passes his inter exam after the first year of study.

B. BEDNARCZYK
Harlow, Essex

SOS Portland Place

SIR: "The finest street in London," said Nash of Portland Place. Still good today, but it's obviously going to lose its superb frilling of Edwardian lamp standards, as Marylebone Council is already dumping in the gibbet style fluorescent fittings. Can you help? I've already written to the RFAC.

C. LUNN
London SE27

DIARY

London, now and what it might be: E. J. Carter's holiday lectures for young people, at the RIBA, 3pm. House full. Return unwanted tickets please.

DECEMBER 28, 29

Architecture of technology: RIBA exhibition organised by the Northern Architectural Association at the Technical College, Peterlee, Co Durham, 2pm to 9pm, except Sundays and Bank Holidays.

Until DECEMBER 29

The implications of dismantling the LCC: J. M. Richards on the BBC Third Programme.

DECEMBER 30

Joining the modern way: Christmas lecture with demonstrations for young people by John Strong MA, at the Institute of Welding, 54 Princes Gate, London SW7, 11am. Tickets from the Institute.

JANUARY 4

NEWS

TCPA

New housing standards discussed

The new housing standards proposed by a subcommittee of the Central Housing Advisory Committee in *Homes for today and tomorrow* were discussed at the first of the Town and Country Planning Association's winter meetings on December 13.

Mrs Evelyn Denington, member of the subcommittee and chairman of the London County Council New and Expanded Towns Committee, described them as 'exceedingly modest' recommendations that brought us 'more or less back to the Dudley standards' of 1944—standards which had been gradually whittled away till we had 'touched rock bottom' with the People's House. When asked by Peter Self and Wyndham Thomas (respectively chairman and director of the TCPA) whether this was not too modest an aim for the next twenty years, in view of the continuing rise in our standard of living, she emphasised that the new space standards had been expressly put forward as minima, and that the subcommittee had had to bear in mind both the ever bleaker economic outlook and the financial impact of its recommendations for whole-house heating and for car-storage—an item that was especially costly in high-density development.

E. V. Collins, Wimpey's chief architect, who was also a member of the subcommittee, doubted whether private enterprise would be able to meet the new standards in lower-income-bracket housing, trapped as it is between the upper millstone of what building societies thought the customer could afford and the lower millstone of rising plot costs dictated by land prices and density restrictions. All the private developer could do, he thought, would be to try to provide the space suggested, leaving heating and other equipment to be supplied later.

As to subsidised housing, Anthony Davies, chief architect to Basildon Development Corporation, pointed out that the improvements in space and heating proposed would raise weekly outgoings on a standard three-bedroom terrace house (including economic rent, rates, water rate, garage rent and heating) from £5 12s 6d to £6 5s, less 12s 6d subsidy. This was getting close to the limit of what an average family could afford, and took no account of further costs, especially for paving and walling, which would be added by the recommended changes in layout and environment.

Fortunately, he went on, there were compensating factors. Universal car ownership, giving every family a link with the country, would dispense with the space-consuming need to bring the country into the town. The car, as it became a normal piece of household equipment, would no longer need to be housed in an extravagant private garage. Higher-density terrace housing, up to an economic limit of 18 to 22 dwellings to the acre, would also reduce costs. Above all, whole-house heating, combined with an overall (instead of room-by-room) space standard, gave the architect an opportunity to rethink the inside of the house, and so to get more effective use out of a given space.

Three basic obstacles stood in the way, however. The first was the Victorian by-law outlook of some local authorities, especially in relation to space about buildings and handling of roads, pavements and services. The second was the building industry's Elizabethan method of 'creating an inflexible house from a multiplicity of slow and costly trades.' In 1939 about 83 per cent of the total cost of a public authority house went into its basic structure, exclusive of internal services and fittings. In 1960 the proportion was 84 per cent. It must be got down to something like 50 per cent. The industry must organise itself to make better use of elements mass-produced in factories. The third basic obstacle was division of responsibility for buildings in a housing area and for roads, paving and landscaping. The architect must have under his overall control, in relation to both æsthetics and cost, the whole execution of the housing area.

Given these changes, Mr Davies thought it was possible to design houses to meet our way of life for the next sixty years. He foresaw the disappearance of the kitchen as an untidy workshop concealed from visitors; the absorption of proudly displayed cooking and washing equipment into the living-space, allowing greater flexibility and alternative subdivision of the ground-floor plan; and the division of the upper floor by factory-made modular cupboards as wall units, allowing two, three or four bedrooms to be easily provided over the same ground-floor plan.

There was some argument from the floor as to whether this kind of flexibility was possible under existing ministerial regulations, and as to whether the subcommittee had adhered to its own principle that flats should be as roomy as houses. From the platform J. P. Macey, housing manager of Birmingham, deplored the subcommittee's tolerance of refuse chutes for blocks of flats, pointing out that the Garchey system brought a saving of 95 per cent in the bulk of refuse removed. On one point, made by Mrs Denington, there seemed to be general agreement: that the building of two-storey houses was one of the most difficult of architectural tasks.

PLANNING PUZZLE

The lapse of Richmond Hill

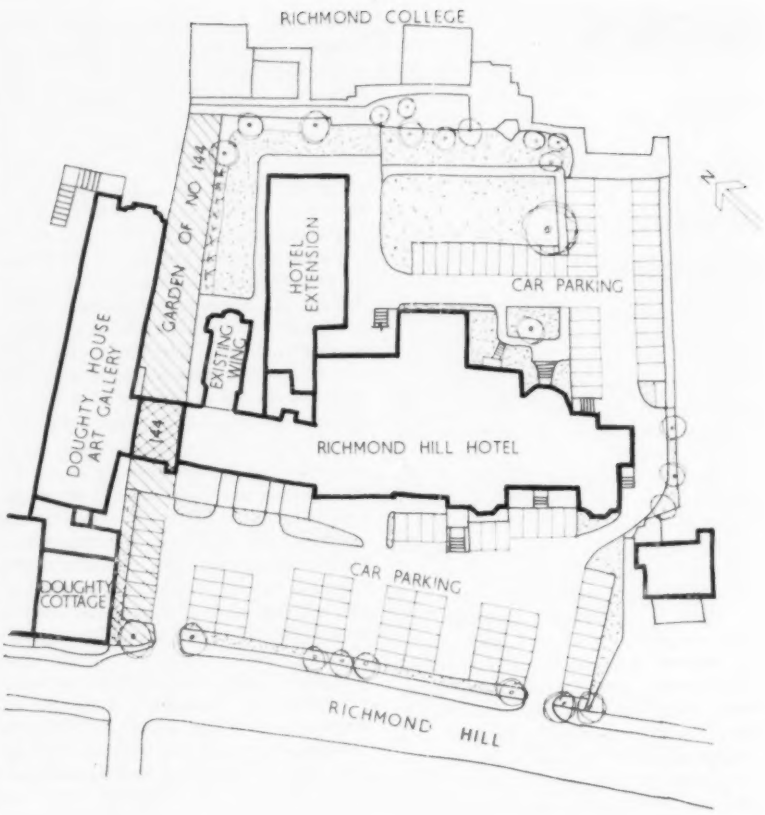
At the top of Richmond Hill, close to the Star and Garter, stands a number of Georgian terrace houses listed as buildings of architectural or historic importance. Several of these houses now form parts of hotels, Mansfield House and Nos 146 and 148, all forming part of one licensed hotel, the Richmond Hill Hotel. But the end house of this terrace, No 144, remains a dwelling-house. Its long, narrow back garden, flanked on the other side for most of its length by the high, blank wall of the Doughty House Art Gallery, and backed by the still taller buildings of the Richmond Wesleyan College, enjoyed until a few months ago an unobstructed outlook to the south-east, where only a short, single-storey building projected from the hotel into the open grounds behind it.

On this open ground, parallel to, and within 30 feet of, the garden of No 144, Sir Robert McAlpine & Sons Ltd has now erected a building 120 ft long, 45 ft wide and nearly 60 ft high as an extension to the Richmond Hill Hotel. The arrival of equipment on the site in April of this year was the first intimation of this project received by Mr and Mrs I. Caplan, the owner-occupiers of No 144, though they have long enjoyed friendly social and professional relations with Mr and Mrs R. Leiserach, who run the hotel for their family company, LPS (Richmond) Ltd. The inquiries they then made elicited the following facts.

In April 1960 an application had been submitted to the Richmond Borough Council (to which the Surrey County Council has delegated planning powers) for permission to build a four-storey extension on this site. This application was rejected on the apparently paradoxical grounds that the car-parking provision it proposed was at once too large and too small—too large to be compatible with the amenities of a residential zone (which this is), but too small to cope with the traffic that would be generated by the proposed extension.

A modified application, which, incidentally, asked for a six-storey extension, submitted in July 1960, had, however, been granted, subject to the condition that all the land shown on the deposited plan as reserved for hotel parking should at all times be available for that purpose. This application was accompanied, as required, by Section 37 of the 1959 Planning Act, by a certificate declaring that the applicant was the owner in fee simple of every part of the land to which the application related, and signed by Messrs Lam, Biel & Partners, the architects and surveyors employed by the contractors. Examination of the deposited plan, however, showed that the drive belonging to No 144 had been included in the

Plan of the site: with the land belonging to Mr Caplan's house shaded and car parking spaces shown



land to which the application related; moreover, eight of the parking spaces provided to meet the planning committee's requirements had been located on this drive. It was also apparent that the height of the proposed building, while just within the limit prescribed by the Daylighting Code for commercial buildings, would have had to be reduced by half to comply with the Daylighting Code for residential areas.

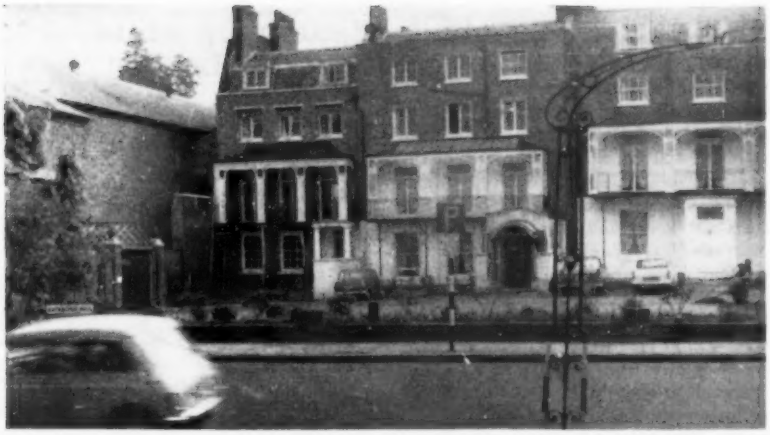
When these facts were brought to the notice of the borough planning committee, the applicants promptly submitted a further revision of their proposals, and corrected the information previously given as to the number of bedrooms in the hotel and extension and correspondingly reducing the number of parking spaces required to the point where none needed to be placed on Caplan property. At its next meeting the local planning committee deferred consideration of this new proposal and it is recorded in the minutes "that the architects acting for the applicants be informed that further consideration will then (ie at the next meeting) be given as to whether or not proceedings should be taken under the provisions of Section 37 of the Town and Country Planning Act 1959 with regard to the submission of a certificate which was materially false." At the subsequent special meeting of the council the chairman of the planning committee said, "We are informed categorically that the area was included by inadvertence, by a mistake and without any intention to deceive." Then, having heard Mr Caplan's representations and a full report from the town clerk (who confirmed that the facts were as stated), the committee decided to take no action. The corrected application therefore lapsed, and the new building (now up to roof level) is still being erected under the original planning permission—a permission which the consenting authority acknowledges to have been secured by a false declaration and to have been based on the wrong Daylighting Code, and which is subject to a condition with which the applicants are known to be powerless to comply.

A special meeting of the borough council was then called to debate a motion by a Labour member that enforcement action should be taken to "secure compliance" with this condition. If this had been passed its effect would have been to oblige the applicants to appeal to the Minister (who would then have held a public inquiry) and at the same time to deprive them of any claim to compensation if the appeal were rejected. But the motion was defeated by 23 votes to 10. Since then the Surrey Planning Committee has asked for a confidential report on the handling of the planning applications for the extension. The MP for Richmond, Anthony Royle, took up the question with Geoffrey Rippon, MP, Joint Parliamentary Secretary to the Ministry of Housing, only to produce a reply which Richmond residents regard as a bombshell: in it he explains that the Minister could intervene but "only takes such action when there are particularly strong grounds for doing so and the circumstances here are not such as to justify my advising him to take this extreme step." The letter goes on, "As you probably know, hotels have become the predominant feature of this particular section of Richmond Hill and the hotel use must, therefore, be accepted, whatever one may think about the effect of the extension." Not only the Caplan family but many Richmond residents see in this comment a danger that the area may be rezoned from residential to commercial use, and even without rezoning it would tend to stimulate the further transformation of private houses into hotels.

It is now open to Mr Caplan (who is a solicitor) to institute court proceedings to have the planning permission annulled. It is not certain that he would succeed, for there is now a monetary penalty for recklessly or knowingly making a false Section 37 declaration, whereas annulment was the only available punishment for such malpractices when the only relevant judicial precedents were set. He would, however, be doing a great public service by taking legal action, for if he won his case he would have established that a developer cannot, simply by making a false declaration, secure a valid permission that would otherwise have been unobtainable (and which might be worth millions) at the risk of a £50 fine, a possibility which could knock the bottom out of Section 37.

Mr Caplan's chances of winning look tolerably good. Learned counsel has opined that a permission cannot be valid if the developer cannot comply with a condition that forms part of it, and the condition cannot be invalidated without invalidating the permission. Moreover, the court would be bound to give weight to the fact that if a true declaration had been made the application would almost certainly have been rejected, like its predecessor, since the applicants would have been obliged to show fewer parking spaces than the planning authority required for the number of bedrooms stated in the application. But to get the permission annulled might be a hollow victory, for it would still be open to the developer to resubmit his corrected application, and to the local planning committee to grant it—unless the Surrey County Council intervened.

This is where the Daylighting Code comes in. In 1959 the county council formally decided to adopt the Code, as recommended by the Ministry; it also "requested" the district and area com-



Above, the terrace on Richmond Hill: the house on the left is Mr Caplan's, the rest are part of the hotel

Below, the garden of Mr Caplan's house flanked on left by Doughty House Art Gallery, has become a sunless canyon as the hotel extension rises six storeys in the garden next door

mittees exercising delegated powers of development control to observe it strictly, and to consult the county planning committee first if ever special circumstances led them to consider relaxing it. In the Richmond Hill case the borough planning committee not merely relaxed the Code but tossed it overboard. Since it did so quite inadvertently, the question of consultation did not arise. But—and here is the nub—it could no longer plead inadvertence if it now considered a "corrected" application involving the same flagrant violation of the Daylighting Code without consulting the county planning committee. If it failed to consult that committee, it would be obliged either to reject the application (and compel the developer to demolish his building) or to act in open defiance of that committee's known policy and explicit request, with the consequent risk of seeing the permission revoked and its own funds mulcted to compensate the developer. And if it did consult the county planning committee, that body in its turn would be virtually obliged either to withhold its consent (compelling the developer to demolish) or to rezone the Richmond Hill area for commercial use, since the application of the commercial Daylighting Code to one development deprives the neighbouring owners of the right to make beneficial use of their land unless they too are allowed to apply the same Code. Such a rezoning would outrage public opinion in Richmond and elsewhere, but whether it would fail to win the necessary Ministerial approval Mr Rippon's letter to the local MP makes somewhat doubtful. All this, no doubt, was in the minds of the Richmond Borough Planning Committee when it decided to take no action on the corrected application.

It might well be thought that the Minister should be anxious to extricate the local planning committee from the mess it has got itself into by holding a public inquiry on his own initiative—and even, if necessary, revoking the permission at Government expense. He has, however, good reasons for preferring to keep aloof as long as he can—reasons which have little to do with the technical defects of the permission.

A major part of Mr Caplan's grievance is that he is being deprived of an essential amenity: his sunny, almost private, garden is being converted into a shadowed canyon, directly overlooked from dozens of hotel-room windows. This grievance would have been just as acutely felt even if the hotel proprietor or the local planning committee had had the common courtesy to let him know what was afoot, and even if the area had been zoned for commercial use and the application had originally been submitted in its corrected form. It would certainly be strongly urged, and would win much public sympathy, at any public inquiry. But it is not in fact a grievance that can properly be taken into account by the Minister or by a local planning authority. Planning law, as Lewis Keeble has pointed out in his recent book, *Town planning at the cross-roads*, was never intended to be, and is not, an extension of the law of nuisance. But because the law of nuisance fails to give an aggrieved individual as much protection as public opinion now thinks he should have, public opinion expects the administration of the planning law to make up for its deficiencies—and some lawyers who ought to know better encourage this expectation. There is no legal right, they say, that is enforceable against a developer who interferes with the amount of daylight which his neighbour has been in the habit of enjoying; but, they imply, everybody thinks there ought to be. It is, therefore, "conceived," they go on, to have been one of the objects of planning legislation that local planning authorities should make it their business to see that this non-legal "right" is respected. The same sort of "conception" was, of course, responsible for the furore over the chalk-pit case. But it is, in fact, a misconception. The object of planning legislation in this regard was and is to safeguard public, not private, amenities.

The Ministry itself is partly to blame for this misconception, because successive Ministers have leant over backwards to avoid seeming to disregard the "rights" of the individual. They have, therefore, treated the amenities enjoyed in common by more than one private householder as public amenities, and in advising local planning authorities as to the circumstances in which it is legitimate to reject an application, have referred to its effect on "an interest of major importance," instead of "public importance." But the Ministry is well enough aware that if it once conceded the principle of this misconception it would no longer have any rational defence against the demand for third-party rights to object to, and appeal against, planning consents; and if that were conceded, nothing could prevent the planning machinery from seizing up.

Nothing can prevent this catastrophe, of course, in the long run, unless other means are found to appease public opinion on this point; for in the long run the law comes to mean, not what it says, or what its makers intended it to mean, but what public opinion thinks it ought to mean. All the Minister can hope to do is to gain time, by avoiding the issue, until his colleagues can be persuaded to bring the law of nuisance into accord with the prevailing trend of public opinion. Then, and only then, will planning authorities be at liberty to concentrate on their proper job.

DEREK SENIOR

RIBA

Architects and torts

The Practice Committee was clearly dumbfounded by the vast audience which gathered to hear the lecture on professional responsibility by J. P. Eddy, QC, which it organised at the RIBA on December 12. Evidently architects are feeling exceedingly insecure on this matter and not without reason. The flood of untried materials and methods and the fact that clients, and the public, are becoming more claim conscious have combined to raise the number of claims and thence the premium rates for architects' insurance.

Mr Eddy dealt only with the law of torts, ie, the architect's responsibility under common law, not with the law of contract. His talk, therefore, turned on what is a reasonable standard of competence in the architect? And on this point there seem to be two conflicting views. Architects have always taken comfort in the fact that the public has no right to expect of them more than a reasonable standard of competence according to the standards of the day. Further, in respect of new methods of construction and new materials, they have reassured themselves with the memory of a case which took place in the 1850s when an architect used a concrete roofing and, on its failure, was held not to be liable because, as the learned judge pointed out, in a novel thing failure may be consistent with skill.

Mr Eddy quoted this case, but throughout his talk suggested that the accepted standards of architectural practice might not be sufficient—that the client might well have the right to expect of the architect more care, knowledge and attention to his interests than the architects of this generation are accustomed to give. In particular he expressed the view that the client has as much right to expect the job to be finished on time as he has to expect it to be completed for the right sum of money; and that, therefore, the architect has the duty to see that the builder programmes his job properly.

He also thought that architects should be more careful in informing clients about their rate of fees. To send the client the little grey book was not enough. They should enter into a formal service agreement with the client (forms for which are available from the RIBA) and should specify exactly how they propose to interpret the scale, telling the client at the first instance when they find that they must undertake additional work not envisaged when the job was first begun.

Mr Eddy had a good point to make on the reduction of architects' fees when specialists are called in. These rates are laid down in the scale, but it is quite common for architects not to reduce their fees at all. Mr Eddy thought this dangerous because not to reduce fees implies that the architect takes full responsibility for the specialist's work.

On the architect's liability to other than the client, Mr Eddy quoted the recent case of *Clayton v Woodman & Son (Builders) Ltd and others* (discussed in the AJ 9.8.61) in which an architectural assistant took it upon himself to tell a workman to cut a chase in a gable which then fell down and hurt the workman. The case has gone to appeal, but the court found against the architect, making him pay £2,352. The moral here, Mr Eddy thought, was, first, that architects should limit themselves to telling builders *what* was to be done, not *how* the builders should do it. Second, that all architects should take out an insurance policy. This point was taken up by Sheppard Fidler, chairman of the Practice Committee who, while proposing the vote of thanks, said that the RIBA would be shortly announcing an approved indemnity policy for architects. The vote of thanks was seconded by A. B. Waters, chairman of the Joint Contracts Tribunal. Sir William Holford was in the chair.

Examining white paper on London

The group set up by the RIBA under the aegis of the Design and Planning Committee to prepare the Institute's evidence to the Royal Commission on Greater London, is now studying the recent white paper in which the Government's proposals are outlined to see what further action should be taken.

There are necessarily huge gaps in the present document, which is to be followed by a second, more detailed white paper before a bill is introduced in Parliament. But some of the points to which the RIBA will direct special attention are related to the whole technical problem of what the enlarged boroughs are going to be and what they will be able to do. What is to be the future of the splendid equipment built up by the LCC to deal with architecture and town planning, and what will be the future of the large number of experienced architects and planners who will be leaving the LCC and the MCC? Will their services be seized upon by the new enlarged boroughs, or are their talents and experience to be largely lost to the Greater London area?

REVIEW

What has gone wrong with our planning?

Professor Myles Wright and D. H. Crompton, of the University of Liverpool Department of Civic Design, are the editors of a valuable symposium on *Land use in an urban environment: a general review of town and country planning* (Published by Liverpool University Press, 35s; also as a special issue of the Town Planning Review). As the most important publication of its kind since the first edition of Peter Self's *Cities in flood*, this symposium on what has gone wrong with our efforts to improve our physical surroundings deserves an extended review. It also needs one. It could, with advantage, have been subbed to just half its length, for much of the historical material that forms the bulk of the lengthier contributions adds nothing to the reader's understanding of our present plight. To plough straight through this dross is tedious; but to skip unguided is to risk missing the pay-dirt. Give your full attention, then, while you are fresh, to F. J. McCulloch on the social and economic determinants of land use. His review of this essential background is pithy and pointed, for all its philosophical overtones, and it does no harm to be reminded that planning has a social purpose. Ponder his development of the theme that "planning in fact is the disposition of investment or it is little." You may feel that he understates the extent to which the "unfortunate regions" of the north and west have shared in large-scale Government-directed investment since the war. You may dispute his view that it must be *economically* advantageous to the nation as a whole to reverse the tendency of employment and population to drift back to the south-east, merely because that drift leaves some north-western resources less than fully used. And you should certainly deplore his naughtily evasive dismissal of the contrary opinion—that this trend is *economically* as beneficial as was the drift to the north-west that left the south and east underdeveloped in the coal-and-cotton era. But you will no doubt recognise that this debatable contention is immaterial to the gravamen of his argument, that we cannot afford to tolerate the *social* disparities that stimulate (and in turn are aggravated by) this south-eastward movement: that these disparities can be redressed only by a disproportionate investment of national resources in the *social* rehabilitation of the unfortunate regions: and that such investment will not be effectively carried out unless it is planned and directed in each region by an authority responsible for the well-being and development of the region as a whole.

Land for agriculture

Dr G. P. Wibberley is also well worth reading in full, for no aspect of our

history over the last half-century has been so widely misunderstood as the evolution of British agriculture and its bearing on the planning of land use. Few of us realise how inherently unstable our farming industry is. For example, a shift in the terms of trade, over which we have no influence, calls for a change of emphasis in agricultural policy, which in turn induces changes in farming practice, some of which require the use of more land and others of less. A tipping of the balance in favour of the latter could well put out of farming use more land than is needed for urban growth in the next twenty years. Dr Wibberley also shows that we could easily replace this urbanised land by reasonable capital investment in reclamation or by the more intensive use of existing farmland, and that "no real argument can be made for the restriction of housing densities in town expansion on the basis of saving food producing land," while there is a danger of increasing dereliction of farmland where the limits of urban development are not sharply defined.

Planning legislation

Unfamiliar turns of phrase, combined with proof-reading so careless that one can hardly believe it was done at all, sometimes obscure the meaning of a chapter by Professor C. M. Haar, of the Harvard Law School, on our planning legislation, with particular reference to the conflict of public and private interests. But the greater effort thus demanded of the reader is rewarded by a penetrating study of the "lawyers' counter-revolution" that has swept the planning field over the last decade. As a spectator well versed in both the British and American games, Professor Haar puts his finger unerringly on weaknesses in our rules and tactics. Notably, he mentions our failure to use the reserve power of compulsory acquisition to secure the use of land in the manner proposed by the plan, which "could make the planning concept come to life," and above all, the reluctance of central Government to be explicit about the objectives of national planning policies. He overrates "the potential threat to planning contained in the avalanche of appeals," which are not, in fact, increasing faster than applications, but he quite rightly maintains that the burden of case-work prevents the Ministry from carrying out such positive planning functions as it has. Professor Haar is especially interesting on the Labour Party's "perplexing" failure to realise that the compensation provisions of the 1959 Planning Act put the clock back not 40 years, to the "fair market value" principle of 1919 (as it purported to do), but over a hundred years to the indefensible "value to buyer" principle which the 1919 Act expressly rejected.

Civic design

From this point the reader would be well advised to jump—with a passing glance at Mr Crompton's painstaking build-up of the case for comprehensive development—to Sir William Holford on the prerequisites of good civic design: unified ownership, a clear statement of community needs, an end to the cleavage at all levels between traffic planning and development planning, and public willingness to do without enough consumer goods and intercontinental missiles to make fine public building financially possible. With that we come to Professor Myles Wright on "further progress," and the guts of the book.

There is nothing of the academic perfectionist about Professor Wright. Obsessed with a sense of 11th-hour urgency, he concentrates on what he thinks can and must be done here and now, regardless of planning principle or democratic doctrine, and his impatience inspires him to write with a taut lucidity that puts most of his collaborators to shame. Why is it that 17 years of universal development control and all the panóply of planning powers have produced little or no positive improvement in our surroundings? Our planners are not to blame, says Professor Wright; they have done nearly all they could. The obstacles to their success have been the abuse of planning powers by local authorities to serve local ambitions and the persistence of unresolved contradictions in national policy. The Government's first duty is to maintain a prosperous and competitive economy, and the resources it can spare for environmental improvement are relatively small. Its planning policies should, therefore, be designed to guide, rather than to resist, the basic social and economic forces of our day, and to concentrate the resources it can spare for improvement where they will do the most good.

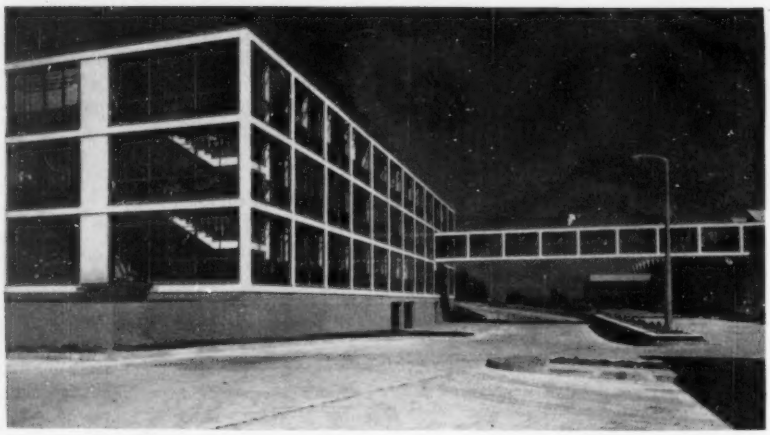
Investment in the north

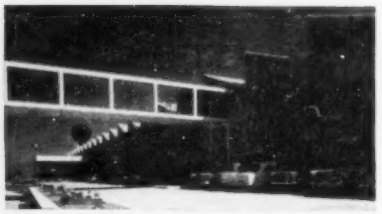
Professor Wright recognises two main forces which it would be futile to resist. One is urban expansion in the outer zones of city regions in all parts of the country resulting from the inward movement of country-dwellers, the demand of prosperous town-dwellers for more living-space, from proliferation of separate households and the mobility conferred by car ownership. The other is the migration to the west Midlands and the south-east of people from the regions where prospects, climate and environment are poor. Since both these forces are, in practice, irresistible, Professor Wright argues, we should use the first to remedy the social ill-effects of the second. He does not, like Mr. McCulloch, seek to convince us that a forced diversion of industrial investment from the south to the north would be consistent with the overriding need to keep our economy prosperous and competitive. His point is that, whatever we may gain economically from the southward movement of jobs, and consequently of people, we gain nothing from the further impetus given by the wretchedness of the northern environment. Conversely, if we want to keep that movement within the bounds of what is economically necessary or desirable, we must not only provide jobs in the north but also make its environment attractive. And the most effective way to bring about such an improvement is to concentrate the limited resources at our disposal on the development of those parts of the north to which people are already moving—the outer zones of its city regions. To this end, the professor maintains, two things are needed. First, a Government decision to give preference in social investment to the five conurbations north of the Trent; and second, some form of regional authority for each of the areas concerned. This authority must be charged with responsibility for the overall planning and development of the land within about an hour's journey (say twenty miles) of the conurbation centre. It should undertake, particularly, the selection, purchase and development of a limited number of large sites for overspill—residential and industrial, public and private—at the minimum distance from the conurbation that is compatible with good living conditions and efficient vehicular circulation throughout the city region.

Why regional commissioners?

Two weaknesses in Professor Wright's formulation of the argument should not detract from its force. In the first place, while he is clearly right to insist on the need for regional authorities, he is surely wrong in assuming that the appointment by the Minister of regional development commissioners would be more feasible, more probable, or more likely to produce the desired results than the creation of elective regional councils. A Government which dare not use its existing powers to order the formation of joint planning boards could not dream of braving the outcry that would greet a proposal to invest regional commissioners with such revolutionary powers. In the second place, while he is again on firm ground in his conviction that long-range dispersal cannot be an effective method of overspill for the provincial conurbations he needlessly courts opposition by describing as "peripheral" the outer zones of their hinterlands in which this overspill must be accommodated, and by implying that much of this development must take place "in the green belt." No doubt some of the sites required are within areas provisionally suggested as green belts by county councils intent on abusing the green-belt concept as an instrument of local political warfare. But the development of such sites is by no means inconsistent with the definition of provincial green belts that would fully serve their purpose.

D. S.





Top, pedestrian entry to factory, with spiralled ramp to production level which on the north side of the building is at first floor level

Left, three-storey office building designed on a 3ft 3in module with precast concrete columns and beams and hardwood sub-frames, fabricated off the site, as infilling to the external walls

Above, west side of factory—the finished goods store with connecting link over the car park to the office block

New packaging factory

This factory at Gillingham, Kent, designed by Farmer & Dark, brings together the manufacture of various products of a large packaging firm. The site is approximately 18 acres with a cross fall of 50ft which necessitated considerable cut and fill. The production area of about 240,000 sq ft is a single-storey steel framed structure with a north light roof. This consists of parallel chord trusses spanning between stanchions at 39ft centres, the upper chord being external to the roof, with welded vertical lattice girders at right-angles behind the north light glazing. Due to the high fire risk, the production area is divided into smaller compartments by full-height brick walls with fire-resisting doors or shutters. Stores for incoming materials flank the production area to the east, with two unloading bays and a process block to house the letterpress, gravure and lithographic departments. A finished goods store with two loading bays flanks the west side and the production area is extendable north-south. The incoming stores area has symmetrical solid-web welded steel portal frames spanning 82ft. An amenities block is sited on the north-east corner with locker rooms, lavatories and first-aid room on the first floor, level with the production area. Below this at ground level are the canteen, dining room, kitchen, recreation room and bar. The frame consists of in situ reinforced concrete columns and first floor beams with precast concrete roof beams and first floor slab. The office block to the west of the site has precast concrete columns, beams and floors, with lightweight infill panels, all prefabricated off the site. A covered link of prestressed concrete spans 90ft and connects the first floor to the production area.

The site was purchased early in 1960 and the contractor commenced work, after his acceptance as the lowest tenderer, five months later. The building was completed in just under a year. This is, of course, quite a speedy piece of design and construction for a £1,300,000 contract and the result is a neat, straightforward group of buildings, and in short term the client has achieved an early start to production. But less insistence on pace at the design stage might have enabled the many requirements of the various processes, plus their possible future development, to have dictated a more radical solution.

the architects' journal
supplement on

architectural education

Joint education

Evidence submitted to the Robbins Committee

The Committee on Higher Education, under the chairmanship of Professor Lord Robbins, was appointed by the Prime Minister to make recommendations on the future pattern of higher education in Britain. The committee issued an invitation to persons interested in the subject to submit evidence. We publish below the evidence submitted by William Kretchmer, reader, and Fred Thomas, senior lecturer, at the Welsh School of Architecture

The subject of evidence

We are presenting the following notes to the Committee on Higher Education because we are of the opinion that in the fields of architecture, building and planning the present facilities for higher education are inadequate; that new demands require a fundamental re-appraisal of the content of such education; and that this cannot be done until its present fragmented pattern and organisation are first rearranged.

Although we are concerned with a number of separate professions, the work of each gains validity and purpose only when combined with the work of the others. Together they give us the environment in which we live and provide the physical background of our towns and countryside.

The main proposal which we are putting forward for the committee's consideration is that faculties of environment should be established in the universities.

THE PROFESSIONS CONCERNED

These faculties should provide education for all those concerned with the shaping of our environment: architects and their specialist consultants who design our buildings; managers and top technicians of the building industry who erect our buildings; town planners, landscape architects and other professions concerned with the wider implications of buildings in their setting of town and country and with problems of land use.

In discussing education for architecture and building we are therefore concerned with:

(1) The various professions which collaborate on the design of our buildings: architects, structural engineers, heating engineers, electrical engineers, quantity surveyors;

(2) Those who will be holding supervisory, administrative, technical or managerial positions on the production side of the building industry.

In discussing education for planning we have to consider: planners, local government engineers, landscape architects, estate managers.

REVIEW OF HIGHER EDUCATION

The facilities for higher education (ie at universities or colleges of advanced technology) in architecture, building and planning are not as numerous as their importance would suggest. This perhaps reflects a general outlook which attaches little importance to man's environment and it is a direct expression of the low standard of minimum entry requirements in most of the professions concerned.

Architects

Full-time architectural courses are available in the faculties of arts of the Universities of London, Liverpool, Manchester, Durham (Newcastle), Sheffield, Cambridge, Glasgow and Edinburgh, and at the Welsh College of Advanced Technology (associated with the University of Wales). Only a minority of architects now admitted to the profession go through these courses; most are either trained in full-time courses at schools of architecture situated in technical colleges and colleges of art, or undertake some form of part-time training. Figures published in 1958 (ref 1 below) show that out of a total of 7,450 architectural students then in training, only 1,131 (15 per cent) were in university schools and the Welsh CAT, 2,368 (32 per cent) were in full-time courses elsewhere, 3,498 (47 per cent) were taking part-time courses, and an estimated total of 450 (6 per cent) were studying through correspondence courses.

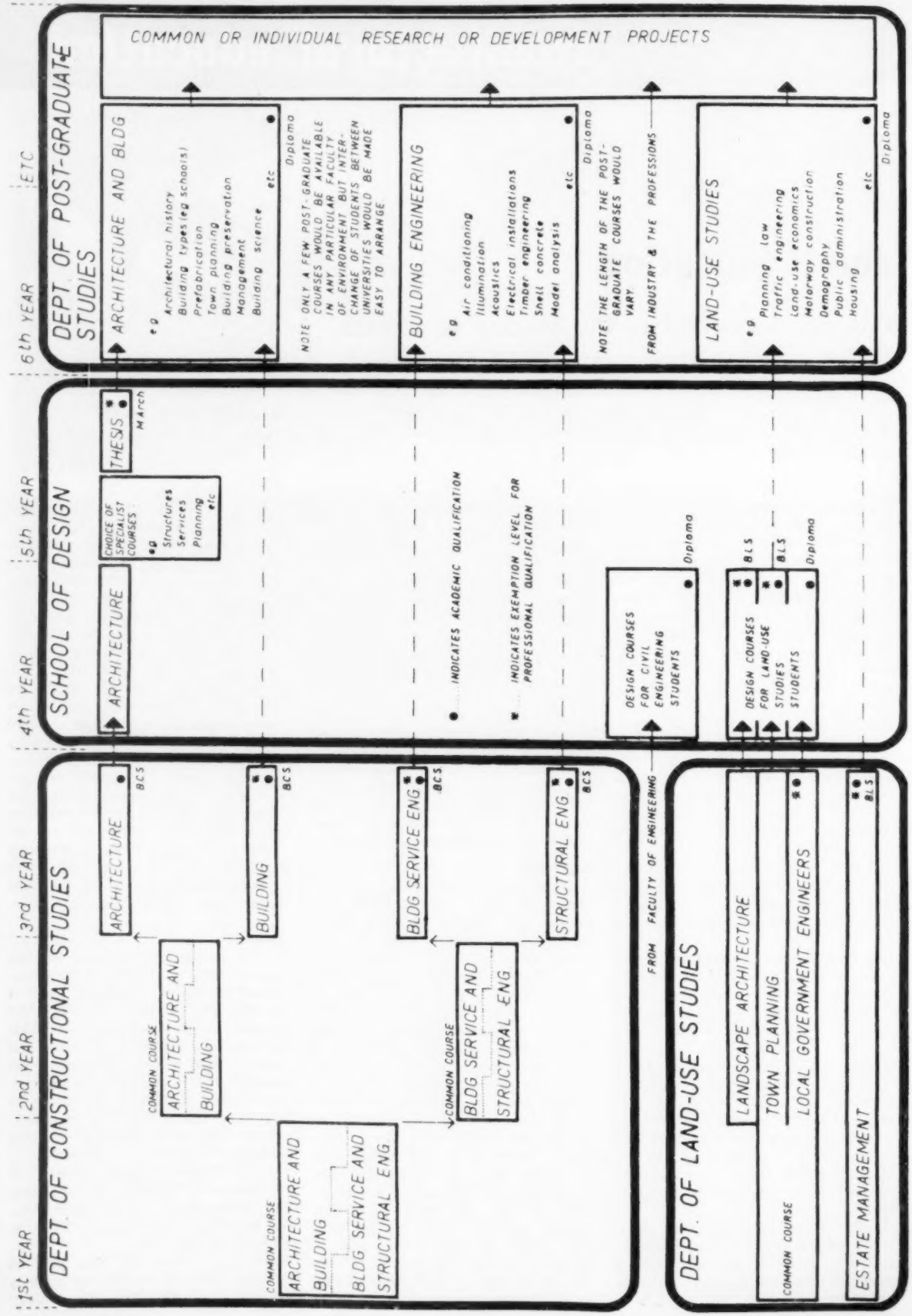
In March 1959 the Council of the Royal Institute of British Architects decided that, starting in 1962, the standard of entry will be raised from five passes at ordinary level to include at least two at advanced level. This decision followed the recommendations of the 1956 Oxford Conference on Architectural Education (ref 2) which said at the same time that ultimately all schools capable of providing the high standard of training envisaged for the architect should be situated in universities or institutions where courses of a comparable standard can be conducted. The integration of the architect's education into the pattern of higher education is therefore in any case a matter for immediate concern, and before any more schools of architecture are established in universities on the conventional pattern (ie. as departments of faculties of art) the question must be asked whether this is still the most suitable way.

Builders

For the managerial level of the building industry there is a course at the Manchester Faculty of Technology, and at one time the University of Wales had a similar course. Departments of building science for post-graduate courses and research have been established at the universities of Liverpool and Sheffield. The building industry is also raising its level of education, following the formation in 1955 of the Board of Building Education by the National Federation of Building Trades Employers (NFBTE) and the Institute of Builders. The minimum entry requirements of the latter have just been raised from three to five subjects at ordinary level.

Although we have not been able to ascertain the total number of building students, it is clear that only a small

Fig 1 Faculties of environment: suggested typical organisation



minority of the leaders of the building industry are trained at Manchester (probably not more than 20 students a year), the normal avenue being courses leading to Higher National Diploma or Higher National Certificate at technical colleges, or CATs; none of the latter has so far established a course leading to a Diploma of Technology in Building. The number of students sitting for the membership examination of the Institute of Builders this year (under the old entry regulations) will be about 1,300, and just under 200 candidates have sat for the first time this year under the new entry regulations.

Engineering consultants

Degrees in civil, mechanical or electrical engineering can be taken at eighteen universities and at four London University colleges. These courses range over a wide field, since the activities of many large industries are involved, eg, radio, telephone, electronics, machine tools or power generation; the application of mechanical and electrical engineering to building can be no more than an incidental aspect. The majority of engineering graduates undoubtedly enter industries other than building. We are unable to quote figures but we are certain that most engineers who work as consultants to architects are non-graduates. The professional bodies concerned are the Institution of Structural Engineers, the Institution of Heating and Ventilating Engineers and the Institution of Electrical Engineers. The minimum entry requirements in each case are below university standards.

Quantity surveyors

There are no higher education facilities for quantity surveyors, and their normal avenue to professional qualification is by part-time study. The Royal Institution of Chartered Surveyors has just announced that the entry level will be raised from five subjects at ordinary level with at least three passed at one sitting, to five subjects at ordinary level passed at one sitting or six such subjects at two sittings.

Local authority engineers

Courses in municipal engineering are available at London and Manchester universities. The disparity in number of university places and membership of the Institution of Municipal Engineers (about 8,000) suggests a small proportion of graduates in the profession, although there may be a few who hold degrees in civil engineering. The minimum entry requirements of the Institution of Municipal Engineers are below university level.

Planners and landscape architects

Courses for planners are available at the universities of London, Liverpool, Manchester, Durham and Edinburgh; they are either for students leaving school who wish to take up planning as a profession in the normal way, or for members of other professions (eg, architecture) who wish to take up planning as an additional qualification; for the latter kind of student the courses are post-graduate and mostly on a part-time basis. There are facilities for part-time post-graduate training at a number of other institutions and, generally speaking, the provision of planning education has grown quickly since the war. The present members of the Town Planning Institute number over 4,000.

The universities of London, Durham and Reading have post-graduate courses for landscape architects, but the number of students is small and the course at Reading is to be discontinued. Both the Town Planning Institute and the Institute of Landscape Architects have minimum entry requirements below university level.

Estate managers

Courses in estate management are available at London and Cambridge universities, and include the subjects of land ownership, land economy and land resources as applied to either urban or rural conditions.

BUILDING INDUSTRY

The largest part of the nation's capital investment is in building. The present annual value of constructional work in Great Britain is about £2,200 million, and the number of operatives employed by contractors averages about a million men. If we accept the argument that economic advancement depends on a raised level of productivity in our industries and that high productivity demands a high level of leadership and technical skill, we must be seriously concerned that there is hardly any provision for graduates to enter our largest industry.

There are particular circumstances in building which make a high level of imaginative leadership especially necessary. Established traditions in an industry with a long history of slow evolution from a craft tend to hamper the introduction of new methods; today's lack of graduates in architecture and building is perhaps a reflection of the fact that building is still looked upon as a craft rather than an industry.

Problems of organisation and production are multiplied in an industry which can never work under organised factory conditions but must carry out its activities on a new site every time. Each product of the industry is the result of a new set of circumstances; each building is specially designed and requires the basic organisational thought for establishing the equivalent of a production line in a factory—where conditions are controlled and are independent of the vagaries of climate. Each building is in fact a prototype and there is no production line.

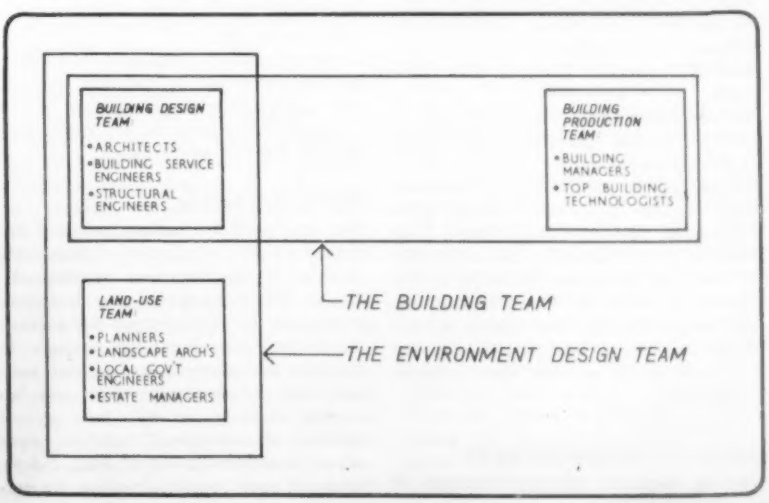
The separation into distinct responsibilities for design and production of the building industry's products is a peculiarity which can be a powerful drawback to development unless the leaders of both sides are of the highest calibre and able to collaborate in full awareness of their diverse roles.

Architects and builders have already appreciated the need and taken steps to raise their level of education and this is clearly in their own interest. But there are good reasons why, from the wider point of view of the nation, they and the other members of the team should be encouraged to do so.

THE CONCEPT OF ENVIRONMENT

What is the reason for our proposal to bring into a faculty of environment all those who are concerned with architecture, building and planning? It is the realisation that an enormous task is facing us in the field of building and planning if we are to create the environment which our technical skill could give us, and in which we could lead a fuller life with higher economic and social

Fig 2. Faculty of environment



standards. Although we have made tremendous progress in technical fields, the environment in which we live is becoming ever more chaotic. Our energies are dissipated by long journeys to work, walking in our towns has become a dangerous hazard and too many of us still live in overcrowded and insanitary surroundings. We have forgotten not only that efficiency and output are dependent on the quality of our buildings and the convenience of our towns, but also that our environment has a direct bearing on the fulfilment of our human needs.

In the eighteenth century, the educated man spent his working and leisure hours in buildings which were well designed and integrated into an orderly town or consciously designed landscape. Indoors there were fine pictures and sculpture, and furniture of the same high quality. Grace and elegance were the essential background to a full life. Our problem today is to regain for the whole of society what was once the privilege of the upper stratum.

Today we are aware of the shortcomings of our environment; we appreciate that life in overcrowded slums numbs the senses and bears much responsibility for dull and uncouth living, and that the chaos of our towns is more conducive to neurosis than to good health. That our environment can be a stimulus for a full intellectual and emotional life, we do not seem willing to recognise. Our town planning legislation reflects this attitude. Planning has become a negative function. We look out for bad development and bad buildings; planners have, by and large, a restrictive function without playing a positive role in creating a better environment.

When we speak of increasing our standard of living—by a third in ten years or doubling it in twenty-five years—this can have no meaning if we only think of it in terms of material possessions and gadgets. Indeed, the prospect of more people owning motor cars under present conditions is merely the prospect of more chaos, more accidents and more frustration. Our standard of living must mean the standard of life we lead, its fulfilment in terms of human happiness and richness. The quality of our environment is an essential factor in such fulfilment.

We need to establish the importance of our environment and then to take active steps to improve it.

The setting up of faculties of environment in our universities would be a recognition that our environment is as essential to our fulfilment and as worthy of study as the natural sciences or the classics or medicine. It would give the men who separately have charge of different aspects of our environment the chance to gather and find their common purpose.

FACULTIES OF ENVIRONMENT

Having suggested the establishment of a new kind of faculty, we must explain how our proposal can be put into practice. Many of the matters which we are about to discuss are for the universities themselves to decide, and if we give our views on the pattern, courses and degrees in the faculties of environment which we propose, it is to illustrate in more detail our aims and the results for which we hope.

We look forward to each university developing its own pattern of courses and degrees within the suggested general organisation of the faculty but always based on the guiding principle of joint education.

Organisation

Fig 1 shows the pattern of the faculty, the subjects of study and their arrangement. The departments of the faculty are envisaged as follows:

A Department of constructional studies—to award bachelor degrees in architecture, building, building services and building structures (structural engineering), at the end of parallel three year courses.

B Department of land use studies—to award bachelor degrees in subjects connected with town and country planning and the management and use of land.

C School of design—to provide courses for students from departments A and B and from other faculties of the university, and to award diplomas and degrees after courses of varying lengths.

D Department of post-graduate studies—for post-graduate courses and research work covering the fields of A, B and C and working in close collaboration with other faculties of the university.

Three teams

Fig 2 illustrates the relationship of the three teams concerned with our environment and it lists the members who should be in the new faculty.

There is no need to explain why architects who head the building design team should be in the faculty of environment; nor is there any doubt about the members of the land use team, all of whom are at different times concerned with policy decisions affecting our towns and countryside.

It is not equally apparent why other professions should be included who are not concerned with design but act as technical consultants or are responsible for the erection of buildings.

Teamwork in building

The quality of our environment will not improve until we achieve a considerable increase in the output of building. Although the building industry has been working to full capacity for many years, we are not making enough progress. In housing, for example, we are not even replacing the dwellings which are becoming obsolete; we still have a vast backlog of educational buildings, most of our hospitals are out of date, and we have not even begun to replace the outworn areas of our cities. The need is for more output at greater speed and reduced cost, but within present resources of manpower.

This need will only be fulfilled by rationalisation of design and building processes and through increased industrialisation of building with assembly of factory-made components on the site. Inevitably the design and production teams will have to draw more closely together as methods of production of components and methods of erection of buildings become an increasingly important aspect of design, and as the design team becomes as much concerned with design of components as with design of buildings.

In the building design team itself the architect will need a complete technical understanding of the process of building and he will require the assistance of consultants who think of themselves as specialists in an aspect of building rather than as specialist engineers. The structural, mechanical and service requirements of buildings are becoming increasingly complex, and only if the future consultants are at the same level with the architect, and from their days of training see themselves part of the design team, will they be able and eager to make their full contribution to building progress.

Collaboration by the whole building team has already given us the most significant contributions to British architecture since the war: the Ministry of Education Architects and Building Branch, Hertfordshire County Council and the authorities working together as the CLASP consortium having given the lead in educational buildings and the London County Council in housing. Higher standards of accommodation, quicker and cheaper building and a new high quality of educational and housing environment are the result.

Building design, with its team of contributors, and building production are merely different aspects of the same subject. It would be disastrous for building if higher education were to expand on the present pattern with different aspects of the subject dispersed in the faculties of art, engineering and technology. We recommend, therefore, that all aspects of building be included in the faculty of environment.

Building service engineers

The present custom is for the architect to engage separate consultants for electrical and heating services. The application of each of these branches of engineering to building is rather a small subject by itself and we suggest that they be combined. The faculty of environment should provide facilities for a building service engineer who would be concerned with all services in buildings (mechanical, heating, ventilating, electrical). This is a wide and interesting field and could attract men of sufficiently high calibre to make a real contribution to building.

Quantity surveyors

The architect and each of the consultants make original and creative contributions to design and if as a result of their inclusion in the faculty they are of the same high level and status they can make joint policy decisions. The quantity surveyor is in a rather different position. At various stages of the work he may be asked a series of factual questions, eg on costs, to which he will provide the answers; his main contribution to the work of the building team is of course measurement of the completed drawings. His task requires a high level of technical skill and of integrity, but he does not make a creative contribution neither could he take part in policy decisions. There seems no need, therefore, to suggest that the quantity surveyor's education should be brought into the universities.

DEPARTMENT OF CONSTRUCTIONAL STUDIES

The department of constructional studies would provide three-year courses leading to bachelor degrees for architects, builders (at managerial and advanced technical level), structural engineers and building service engineers. In the case of the three latter, this degree will give exemption from the final examinations of the professions concerned, but in the case of the architects the professional qualification will be gained only after a further two years in the school of design.

There is no professional body to cater for the building service engineer as he will emerge from our proposals. This need not be a deterrent because, unlike architects, engineers need not be registered or members of a professional body to practice. Graduates of the kind we envisage would be better qualified than most of their colleagues in existing professional bodies, and it would not be long before a suitable way of incorporation was found, in either an existing or a new organisation.

Joint education

Joint education is an essential concept of the faculty and is reflected in the organisation of all departments. In the department of constructional studies students would gradually progress from common to more specialised courses. Fig 1 shows the first year basically as a common course but in two streams, one for architects and builders, the other for structural and building service engineers; in the second year there would be two separate courses, each with two streams, and in the third year four separate courses.

This pattern reflects the subjects which can be studied in common in lecture room, laboratory and practical work and it will enable each subject to be examined from more than one point of view. The diagram cannot indicate what we consider an even more important aim, which is that students should engage in studies, projects and exercises —in small or larger groups—where each participant plays his specific expert role. Thus, at this formative period in their lives, students would learn to understand each others' viewpoint and to develop the sort of relationship and inter-dependence which they will need in practice. Although the first kind of common activity would decrease as the courses progress, we envisage that the latter kind will become more developed as students go through the course.

In a period when educationalists are concerned about the "two cultures" the idea of joint education within a faculty of environment offers an opportunity to bring at least some professions into realistic contact. Architects, traditionally "arts" men and often accused of having their heads in the clouds, would benefit from contact with students of building and engineering who are occupied more with the technological analysis of a problem and with practical matters such as finance and management. Engineers would benefit from contact with students who are concerned with the human implications of a problem and not exclusively with its technological aspects. Building managers would benefit because, in spite of the fact that management studies are now recognised as a subject in their own right, it is undesirable that managers should be trained as a separate class. Joint education offers the most suitable background for training in a managerial career.

Joint education can also provide a more fruitful method of bridging the gap between the two cultures than the introduction of liberal studies courses for builders and engineers or of popularised science and technology for the architects. There will be the opportunity for a stimulating course and for education in its full meaning. The study of man in his environment—in history and in the present day—introduces and links aspects of sociology, philosophy and economics with art and technology; it can be the vehicle for the study of human development. History of architecture could be rescued from its present arid status of history of styles. In this kind of study, all students of the department can join on an equal footing throughout the three years.

Problem of wastage

Joint education offers an opportunity of reducing wastage in various courses. It has proved very difficult for example, to select suitable students of architecture at seventeen or eighteen on the basis of school examinations. The same sort of problem exists in other university departments, but perhaps to a lesser extent. It would probably be much safer to predict success for an engineering student on the basis of a good maths and physics record at school than for a potential architect on his performance in the art course, since the ability to draw well has little to do with an ability for architecture. No method of vocational testing has yet been developed which overcomes this difficulty and as a result those who are responsible for selecting students of schools of architecture tend to rely on personal intuition. Likely students are in fact given an opportunity to try their hand; lack of ability only becomes evident after a year or two when it is rather late to turn back. Staff and examiners feel responsible for not having seen the student's deficiencies earlier and let him complete the course. In the long term such decisions are against the better interests of both the student and the public.

A change from the rigid structure of separate courses to joint courses would allow students to transfer to a more appropriate course at any time during the first three years, since at any stage it would be possible to transfer to a parallel stream by going back one year.

Design content of the architect's work

The bachelor degree awarded to architects after three years in the department of constructional studies will not be equivalent to the final examination of the RIBA. The justification for the additional two years lies in the design content of the architect's work. The education of the architect has to achieve two main ends; to equip him with sound knowledge of the theory and practice of building and structural design; to develop his appreciation of fine building and under expert guidance bring out his intuitive design ability. But they are two aims which can be achieved only in sequence; the second depends upon the first.

Dr Bronowski has reminded us that architecture is not decoration, and it is not a jigsaw of technical tricks. A building is not a beautiful shell, and neither is it a functional shed. A building is the coherent solution to a problem in living (ref 3). A design must stand up to rational examination of how it fulfils its purpose in terms of physical, physiological and psychological needs and it must be capable of being built within the technical and economic limits which apply.

The process of design is a continuous interaction of intellectual judgment and intuitive impetus; the intellectual judgment depends on deep knowledge to provide the criteria.

If the student is not equipped to apply the tests of the emotional and rational requirements of the problem to his design he is not able to evaluate his work and tell the difference between competent and stimulating design and a pretty drawing. Valid architecture is based on expert knowledge of the nature and purpose of building and on intellectual skill in a mature personality, and it is for this reason that we propose that the student must go through a three-year course aimed at attaining these objects before he can be allowed to proceed to a design course. We believe that eighteen months to two years is a minimum requirement for such a course.

We are aware that this proposal is a radical departure from the present pattern of architectural education in which the design of complete buildings is undertaken almost from the first day. It is the pattern which has existed ever since organised architectural education became established in this country in the last century, when it modelled itself on the French Academy. The nature of the architect's work and his role in society have changed so fundamentally that this pattern no longer has any meaning.

Two-tier profession

The arrangement we propose would also provide a solution for the problem of the two-tier profession. This arises from the fact that about a third of architectural office manpower has no professional qualifications. W. A. Allen, in the talk to which we refer later in more detail (ref 4), suggested that a suitable form of training should be devised so that such men could carry part of the technical burden at junior and senior levels.

A man who has gained his bachelor's degree at the end of the three-year course in the department of constructional studies, could leave the faculty if he felt himself unsuited for a design course. He would have the knowledge, approach and outlook to make a contribution to the work of the team as an expert in building and at the same high level as the structural or building services engineer. He could also advance his studies by post-graduate work.

DEPARTMENT OF LAND USE STUDIES

This department would provide courses of study for the professions concerned with planning and the use of land: planners, local authority engineers and estate managers. Landscape architects are also included here because, although often working with the design team, they need to take a much more active part in the planning of our towns and country and their studies are most closely allied to the land use team.

The courses for landscape architects, local authority engineers and estate managers would be three years leading to a bachelor's degree and the appropriate professional qualification. The third year of the course for landscape architects would be taken in the school of design.

Owing to the complexity of the subject the full planning course for students who choose the profession on leaving school is to be a four-year one, leading to a degree and professional qualification, with the last year spent in the school of design.

The need for local authority engineers to have the opportunity of a design training is discussed later.

Specialists have recently appeared in the world of planning and land use, notably traffic engineers and road engineers. It is doubtful whether at this stage there is sufficient call to warrant separate courses for them or indeed whether specialisation to this extent should be encouraged. The subject of roads and traffic will be part of both the planners' and the local authority engineers' courses.

The design and supervision of major schemes of roads with bridges and flyovers is normally entrusted to civil engineers, and collaboration between them and planners or local authority engineers (according to the type of authority concerned) may be a more satisfactory method of working than a new profession which selects one particular task of the latter (planning of roads) and combines it with one particular task of the former (design of roads). If our proposals for a design training for civil engineers are accepted, this type of collaboration would be especially attractive.

Joint education

Many of the preliminary studies by planners and local authority engineers cover the same ground, eg, economics of land use, law relating to land use, surveying, central and local government, and we envisage their first year as mostly a common one as suggested earlier. Common projects can be undertaken by all students of the department, and there is opportunity for contact and collaboration with other departments and other faculties, especially in the wider studies of man in his environment.

SCHOOL OF DESIGN

Course for architects

Architectural students who have gained a bachelor's degree in the department of constructional studies would join the school and, we suggest, should be awarded a master's degree after two years; this would give exemption from the final examination of the RIBA.

We are not sure that the best use is made in schools of architecture of the time available, especially of the whole year given to preparation of a thesis design. We would prefer to reduce this to half a session and use the other half on a specialist subject. This would introduce the student to the nature of post-graduate work, and the study could be undertaken under the guidance of the department of post-graduate studies; once again he would come in contact with other students of the environment team, including, perhaps, students from other faculties of the university. An additional certificate could be granted for outstanding work in a specialist field.

Courses for engineers

It is a remarkable fact that many of the objects and structures which surround us are designed by men who have no training for this task and to whom the idea that design is a skilled discipline hardly occurs. Engineering courses invariably stop short at the completion of the factual part of the subject and there is virtually no opportunity for engineering students to develop an intuitive design ability. As a result, responsibility for the design of roads, bridges, motorways, flyovers, dams, reservoirs, hydro-electric schemes, pylons, railway electrification, street furniture, street lighting, paving, is in the hands of men who have received no training in design.

We suggest therefore that the school of design should provide one-year courses in design, leading to a diploma for the two kinds of engineer most concerned, the local authority engineer and the civil engineer. The former would join the school of design after completion of a course in the department of land use studies, and the latter would join after a course in a faculty of engineering.

Not all engineers would be able to benefit from design training and there would have to be selection. There would probably not be sufficient demand for both types of course in each faculty but demand would increase with growing appreciation of our environment, and eventually engineers who hold a diploma in design would become leaders of their profession.

DEPARTMENT OF POST-GRADUATE STUDIES

This department would be responsible for post-graduate courses of study and for post-graduate research fellowships. It is suggested that each faculty of environment should establish not more than a few post-graduate courses in the first instance and that the faculties co-ordinate their efforts to make sure that they do not cover the same ground but between them embrace the most important subjects. Fig 1 lists examples of types of courses which could be established.

Post-graduate research and development work in architecture, building and planning are unlikely to expand until the organisation and character of education lead naturally to a desire for further study. As long as members of the team are dispersed in different faculties and in many institutions of lesser calibre, there is little chance of their getting together for post-graduate work. While architectural students see their work as mainly intuitive and hardly based on analysis and technical competence, they are unaware of the very aspects of their work which call for further study and tend not to think of themselves as fitted for systematic development of any subject at advanced level. We hope therefore that establishment of a common faculty and the teaching approach to design incorporated in it will be a stimulus to advanced studies.

The opportunities are unlimited for studies by large or small groups and by individuals. Generally the principle of joint eduction—or rather study—will be much in evidence, although there is scope for studies in depth of subjects which concern one specialist only. There would be much opportunity for contact with other faculties of the university.

ESTIMATE OF NUMBER AND SIZE OF FACULTIES

The following remarks are necessarily of a general nature owing to the lack of statistics on students and members of the professions concerned.

The decision of the Royal Institute of British Architects to raise its entry level to university standard means that architectural education will be in universities or similar institutions. About 900 now enter the architectural profession each year; if this were to continue the present membership of about 18,000 would double in forty years; it would remain at its present level if the annual entry figure were about 500. Too many factors are involved for us to predict the future size of the profession, but for the purpose of our estimate we suggest an annual entry of 600 graduates.

A typical number of students in an architectural course is 25, and on this basis about twenty-four schools would be required for architects. This is fairly close both to the twenty-five architectural schools at present recognised by the RIBA for exemption from its final examination, and to the total number of universities in the country. Roughly speaking, we can say that each university should have a school of architecture, or its equivalent in a faculty of environment; and this reveals the size of the problem, since there are only eight schools of architecture in universities at the moment.

In the other professions the minimum entry level is invariably below university standard and not all students therefore will automatically wish to study at a university. Nevertheless, we must compile our estimate on a basis which will satisfy the needs of building and planning for a higher level of education.

We think that, considering the amount of time and work contributed on both sides, the number of builders in supervisory, technical or managerial positions should equal the number of architects. The figures quoted of candidates for the Institute of Builders examinations suggest that this is a not unreasonable aim.

The number of structural and building service engineers required is less than the number of architects or building managers and we think a reasonable proportion is twenty engineers to every fifty architects and builders.

The average annual qualifying rate from each of the twenty-four faculties of environment would then be: twenty-five architects, twenty-five builders, ten structural engineers and ten building service engineers, a total of seventy per annum. This number of students in the department of constructional studies together with the department of land use studies, the school of design and the post-graduate department could form the basis of a viable faculty.

ACKNOWLEDGMENTS

We wish briefly to acknowledge some of the major contributions of recent years which have influenced us in formulating our proposals.

Professor Sir Leslie Martin

In his *Overall view of the architect's training* (ref 5) Sir Leslie Martin urged that architectural training (which he assumed could mean education) should be directed towards a realistic end; that this should be the major task ahead of the profession—the reforming of our surroundings. He thought that architectural education was often built around the cult of design orginality, whereas it should be directed towards "the study of the form of our environment" which as a society we had lost the power to control.

He stressed the great merit of the study of environment as containing all the independent architectural problems and relating them to each other, and he envisaged each centre of architectural education making a contribution to urgently needed research into the problem of environment and at the same time forging a link between such research and training.

W. A. Allen

W. A. Allen, who is chief architect to the Building Research Station and director-designate of the Architectural Association School, in a paper to the Royal Institute of British Architects (ref 4) stressed the need for schools of architecture to keep in mind the architect's responsibility to the community which he saw as the wise investment of the country's resources looking to high dividends in economic and human terms. He thought that the toughest problem in architectural education was the handling of science and technology because of the dependence of design on knowledge and mental discipline.

He expressed the view that neither architects nor the other professions had yet fully realised that they formed a sort of super-profession for the building industry; that the fragmentation of engineering in building had gone too far and that the time had come for a grouping together of equipment engineering.

Mr Allen also made a plea that human and aesthetic considerations should have a place in the education of the engineer.

Working party on building

The Minister of Works appointed the Building Industry Working Party in 1948 and its report was published in 1950 (ref 6). Its major task was consideration of the methods by which the efficiency of building operations may not merely be brought back to the pre-war level but carried above that level (para 67).

The working party said that the efficiency of the industry must depend largely on the quality of its management and of its directing staff and that in the past there had been too little effort to provide organised training to supply this need. It commented on unsuccessful attempts to establish chairs of building at certain universities, and suggested the institution of courses in universities or technical colleges which might be taken in common for, say, two years by the future builder and the future architect; an arrangement of this kind would have the great advantage of widening the scope of the training in building and preventing it from being too narrowly technical as it rather tends to be at present (para 74). It would be of advantage if those who desired to enter the industry were able to take a common course of study for an initial period before deciding whether to enter as architects or to take up managerial appointments on the contracting side (para 85).

Percy Johnson-Marshall

Since the working party report there has been a continuous flow of contributions and comments from industry and the professions on the subject of joint education. The most outstanding contribution is the detailed proposal for a new university faculty by Percy Johnson-Marshall, senior lecturer at Edinburgh University (ref 7).

As far as we are aware, the only positive reaction to the long discussion is the decision by the London County Council to set up a college of architecture, building and planning. The courses at Manchester offer opportunities for common studies by builders and structural engineers and those at Durham for architects and planners.

Peter Trench

Peter Trench, director of the National Federation of Building Trades Employers, in a recent address on the future of the building industry at the Royal Institute of British Architects, spoke of the urgent need to reduce waste in building through better training, increased managerial skill, mechanisation and prefabrication or off-site preparation (ref 8). He foresaw a larger volume of work carried out by the present total manpower of the industry, provided that there was better education and training in every department.

Referring to the need for closer collaboration between design and production teams, he thought that in future design production will be co-ordinated in some cases and integrated in others.

He concluded by saying: Perhaps of all the points made so far the one I would like to emphasise most is the educational one of joint training and he severely criticised architects for paying lip service but taking no action in this sphere.

CONCLUSION

We have attempted to analyse the needs of higher education for architecture, building and planning and we have put forward a proposal for their fulfilment. The present unsatisfactory pattern reflects the fragmentation of the subject and

demonstrates lack of common purpose and unawareness of a common responsibility to society.

It is not surprising that, despite the many calls by leading individuals, a concerted plan has not been put forward by organisations concerned nor that no single professional body has taken any steps going beyond the boundaries of its own interests. It would be unrealistic to expect that the fundamental changes which are needed could come from the organised bodies of industry or the professions; a raising of educational level of one or two of them is not likely to increase unity of purpose.

The initiative must come from an independent source and the universities have an opportunity of and a responsibility for bringing individual interests together and demonstrating to them that their common task is the creation of a worthy environment for the whole of society. The urgency is clear: at a time when we are facing an expansion of higher education the universities must make sure that a fair share of the country's most valuable talent is attracted to this great endeavour.

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POSTSCRIPT

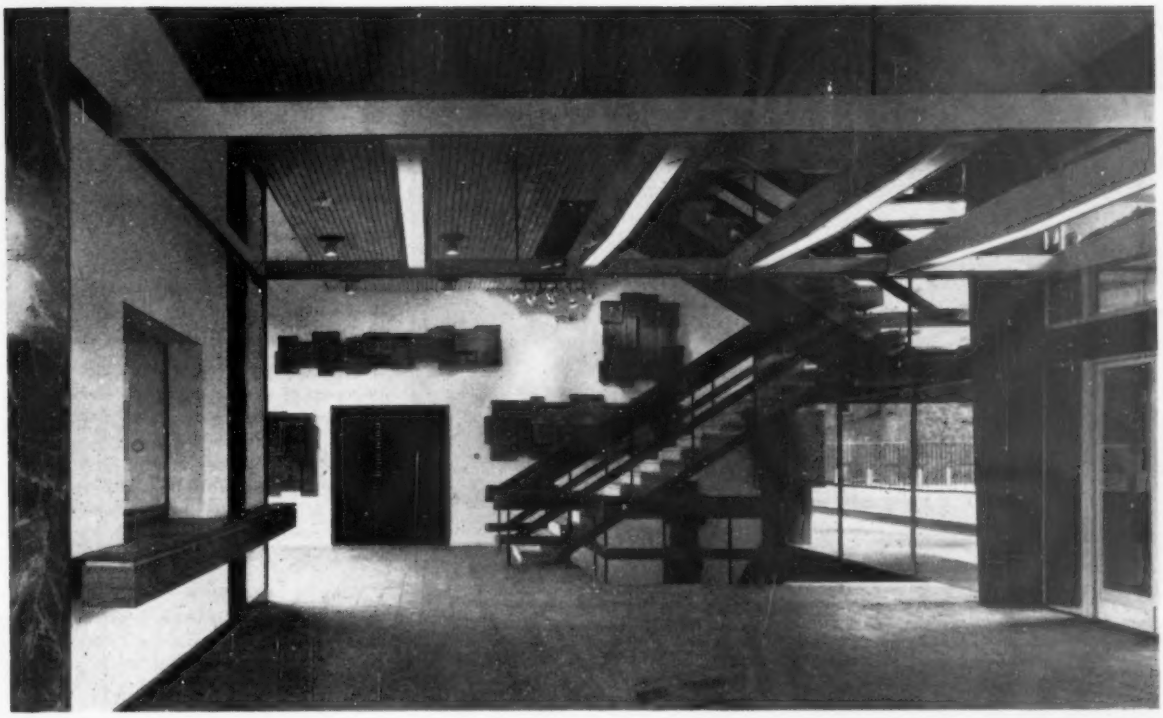
The following is a postscript by the authors of the evidence. It is a note on matters outside the scope of the Robbins Committee but of importance to the architectural profession.

Our proposal to separate the architectural course into two distinct parts—three years in the department of constructional studies and two years in the school of design—would mean that programmes for the design of *complete* buildings are not set until the student has reached his fourth year of studies and entered the school of design.

At present most schools of architecture set such programmes much earlier, often in the first year, and this may indeed be the cause of many of the weaknesses of architectural education today. The first- or second-year student lacks the knowledge and experience to solve complex design problems of a building, and any building design he produces cannot fairly be judged on the basis of technical, functional or environmental qualities. As a result his design is mainly considered on its failure or success as a piece of purely visual design. Once established in the student's mind, this one-sided standard of values is difficult to replace.

Training in building design can begin with relatively simple problems and develop commensurate with the student's knowledge and intellectual stature. We envisage, therefore, that in the department of constructional studies design problems will be set throughout the three years but that they will not involve complete buildings. They will be limited to particular aspects—small structures, furniture, fittings, use of colour, interior design—or they will deal with specific elements—walls, roofs, windows, stairs, etc. This method would have something in common with the method of German schools described recently in the RIBA *Journal* by D. Thornley.

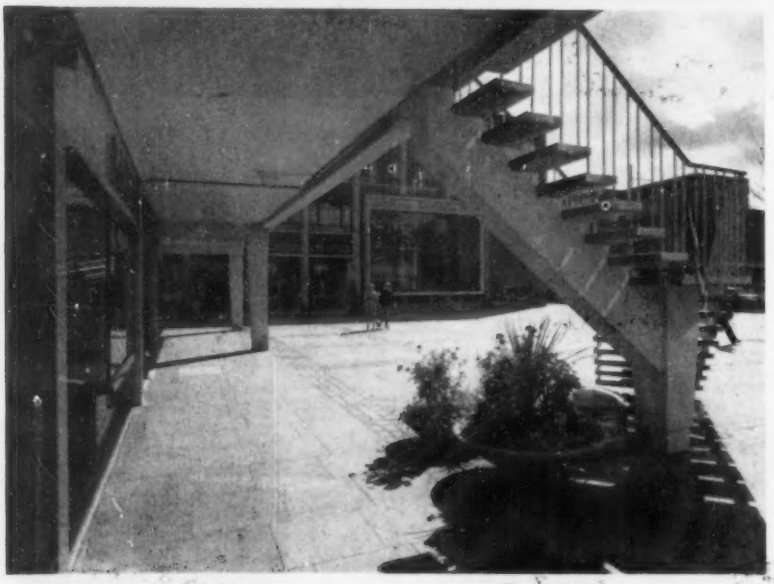
It may be worth reminding readers that the purpose of our evidence was not to make recommendations on the syllabus or content of courses in universities, and that the names chosen for the departments do not imply that all design activity should be excluded from the department of constructional studies or any structural studies at advanced level from the school of design.



Liverpool University mathematics building

This distinguished addition to Liverpool University's post-war development is the new mathematics building designed by Bryan and Norman Westwood & Partners. The clarity of concept and detailing is well exemplified by the entrance hall (top). The building relates well to Spence's physics block close at hand (visible on right of lower picture). Although the university's development is based on an overall plan, it is unfortunately being carried out piecemeal, mainly restricted to fit a pattern of existing roads whose function will largely disappear when the whole precinct is completed. We hope to publish the mathematics building more fully in our series of Building Studies. (Sir Basil Spence's physics building [(97) 727.3] *was cost analysed* AJ 28.7.60)

Shopping precinct at Canterbury



The new Longmarket Precinct, on a site previously occupied by temporary shops built immediately after the war, lies between St George's Street and Burgate, being land owned by the City Council and leased to developers. The architects for the building were J. Seymour Harris & Partners, for the developers, in collaboration with J. L. Beriers, City Architect and Planning Officer, who prepared the basic scheme for the local authority. One of the dominant features of the site is that beyond it, as seen from the main street, rises the dominant bulk of the cathedral, topped by the central and Norman towers. The precinct has therefore been conceived visually as a frame and foil to this view, with a paved square opening out from the main street, with two-storey development on the north-west side, and a combined single and four-storey block on the north-east. A flight of steps provide direct access from the square to the roof of the single-storey section, which serves as an open air café terrace, possessing a splendid view of the cathedral beyond. Under the two-storey block there is a basement open to the public to view the remains of a Roman villa found on the site. The scheme is linked with a pedestrian street which connects the square with Burgate, in the direction of the cathedral, and includes direct rear access for vehicles to the shops, associated with parking space. The paving and street furniture in the scheme have been directly carried out by the local authority.

File this week

Floors, ground: General, SfB (23) is the subject of this week's Element File which begins on page 1305. The Information Library, of which the Element File is a part, begins on the opposite page. Features preclassified for removal and filing in SfB order are:

1 **Products File** (pages 1289, 1290). A record of new products and services, this is arranged for cutting into A6 sheets. The items are classified separately so that when the sheet is cut, each product or service can be filed in its place. Alternatively, the sheet can be filed intact under Aa2 in an SfB file.

2 Working Detail (pages 1291, 1292). **Screens, louvred: General,** Louvred clerestory: House at Helsinki, Finland. To be filed under SfB (35): UDC 69·028·3.

3 **Index to AJ Cost Analyses.** For the five years 1957–61 (pages 1293, 1294). File under SfB Aa2: UDC 05. See also note below: Throw out this week.

4 **Current wage rates, market prices and measured rates** (pages 1295–1304). File under SfB Ba7: UDC 69.003.121.

The Element File contains:

5 **Element Design Guide** (pages 1305–1318)

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7 Information Sheets: Two on **Solid floors on the ground**—damp-proof membranes and thermal insulation.

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SfB (73)

UDC 643·34

Automatic washing up

Prestcold, after several years' refrigerator production, is now moving into the domestic appliances market, and has just introduced a dishwasher and a food refuse disposal unit, both made at the new Swansea factory. The dishwasher is fully automatic and can be set to deal with either very dirty and greasy crockery, including saucepans, or such things as glasses which need less stringent cleaning. The machine uses ordinary "hot-tap" water, but has a booster heater to bring the temperature to 160 deg F and another heater for drying. A filter traps particles of food so that they are not redeposited on the dishes, and only two connections are needed, a twin hose to the hot tap and current from a 3kW socket. Price, with purchase tax and a one-year service fee, is £101 17s. The disposal unit will deal with all types of food waste, including bones, fruit pips and even oyster shells. Price, again with a year's service, is £45 3s.

The Pressed Steel Co Ltd, Swansea, Glamorgan

Prestcold dishwasher

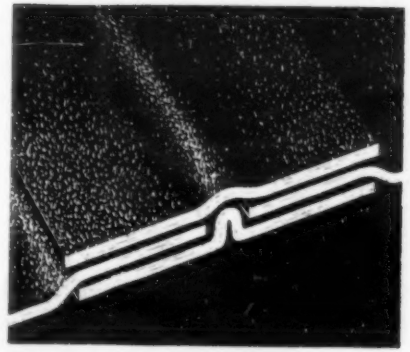
SfB Nn8

UDC 69·024·15

Nuralite roofing

Nuralite is an asbestos-bitumen thermoplastic material which has been on the market for some years and carries a 25-year guarantee. A form known as Twinrib has recently been developed for near flat roofing and is suitable for pitches as low as 1½in in 10ft. The section on the right shows the arrangement of the joint, made with a ribbed strip, to take the standard 8ft by 3ft sheets which are then covered with a capping piece and heat-sealed with a blowlamp and a hot iron.

The Nuralite Co Ltd, Whitehall Place, Gravesend, Kent



Twinrib roofing

SfB Du5

UDC

Wear-resistant floors

Maximent is a liquid floor coating which can be used, inside or out, on any slightly porous material such as concrete or stone. For interior work, however, a three to one sand-cement screed is recommended. The material is a polyester resin used with a setting compound, and is applied in priming and finishing coats to a total thickness of $\frac{1}{16}$in. The material is fairly liquid, can be dressed up coves or round pipes, and sets in a few hours, the exact time depending on the temperature.
The finish is made in a range of twelve colours which can be mixed to give marbled patterns if required, and is applied by hand with spreaders. Resistance to traffic and heavy point loads is excellent, and it is unaffected by temperatures up to 250 deg F and by most of the usual oils and chemicals. The finish is smooth but non-slip, though special aggregates can be incorporated in stair treads or sloping surfaces to give extra grip. Any of the usual detergents can be used for cleaning. Cost, laid, is about 30s per sq yd, the work being done by the manufacturer's contract department or by appointed firms.

Burt, Boulton & Haywood Ltd, Belvedere, Kent

Applying Maximent floor coating

Products File by Brian Grant

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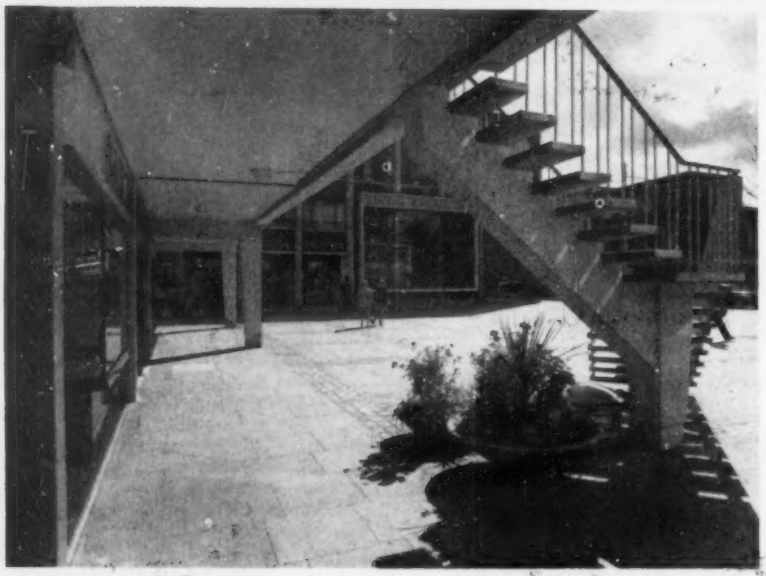

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Who specified this wastepaper basket....?

He was a very talented architect, who knew all about design and quite a bit about comfort, but he missed a vital point. Design has three dimensions; comfort has four—length, breadth, depth and **human nature.** His client could never have kept a grate like this stoked. It was bound to end up as an ornate wastepaper basket.

At least there was no attempt to solve the problem in a plain-blunt functional way. This was a period fireplace and quite unashamedly decorative. You couldn't use an electric heater with it. Or could you?

Yes, if it was the right kind of electric heater. A Magicoal period fire is quite the best compromise in a situation like this. Nothing else re-creates the atmosphere of the original fireplace so cleanly and so easily. May we send you a catalogue? Better still, why not visit our showrooms in Newman Street?

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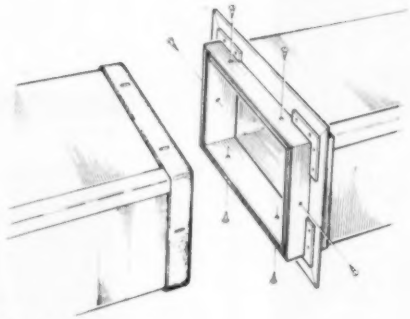
SfB (5)

UDC 69·027·7

Plastic ducting

Terrain is now producing pvc trunking for ducts and ventilation. The ducts are made up from solvent welded extruded sheets and sections, and there is a full range of tees, bends, offsets, dampers and inspection doors, plus diffusers and grilles with fixed or adjustable louvres.
Standard colour is grey, but others are available if required.
Plastic ducting has a number of advantages. It is light in weight, so that installation is easy and hangers can be less elaborate. In air heating ducts the material reduces reverberation and its resistance to air flow is small, so that reductions of up to 15 per cent can be made in the dimensions which would be required for galvanised steel. Chemical resistance is good, except to hydrocarbons, which makes it suitable for the extract ducting of fume cupboards. Thermal conductivity is low and the insulation often used with metal ducting should not, as a rule, be necessary. It must be remembered, however, that the material is thermoplastic,



Terrain pvc ducting

and its use for temperatures above 140 deg F is not recommended.

AB Plastics Ltd, Ventilation Division, Cray Avenue, St Mary Cray, Orpington, Kent

SfB (63)

UDC 628·95

Ceiling roses

The diagram shows a ceiling rose which is made in two parts, with a sliding member to carry the drop flex or screw-in suspension tube. The main part of the rose is permanently screwed to the ceiling in the usual way, the lower sliding part being instantly removable for ease in cleaning the fitting at ground level as current is transmitted by spring loaded pins. Rewiring is also much easier as there is no need to work overhead. It would even be possible to move fittings from one room to another. Price is 12s 6d retail in any of six standard finishes.

Mason & Lewden Ltd, 5 Argall Avenue, Leyton, London E10

SfB Rk4

UDC

Structural joinery and insulation

Glinex panels are made from flax shives and a synthetic resin, the shives being what is left after the threads have been removed from flax. As a result of the process the shives are more or less inert and not subject to attack by micro-organisms. The panels are made in five densities, from 44 lb cu ft to 18 lb cu ft and in several thicknesses. Standard width is 4ft and lengths can be up to 13ft 6in. The panels are used for a number of purposes, thermal and acoustic insulation, partitions, shuttering, furniture, and, in the heavier grade, for load-bearing floors. Veneering and laminating with most materials are simple, but there is the usual proviso that any facing should be applied to both sides.

Glinex Building Materials Ltd, Carpenters Road, London E15

SfB (53)

UDC 696·4

Water heating by gas

Some months ago, Main Morley introduced a thermostatically controlled single point instantaneous gas water heater, and this has now been followed by a multipoint version with an output of $\frac{1}{2}$ gal a minute at a constant temperature of 140 deg F. The action of the automatic gas valve keeps the temperature constant down to quite low water flow rates, the gas consumption varying according to the temperature of the water supply. The manufacturer has also produced a safety valve to control the supply temperature if the heater is used with a shower fitting and a mixing valve. The standard finish of the heater is cream or white stove enamel, and, as can be seen from the illustration, it takes up very little space. It is on the Gas Council's list of approved appliances and has also had the blessing of the British Waterworks Association.

Main Morley Ltd, 48 Grosvenor Gardens, London SW1

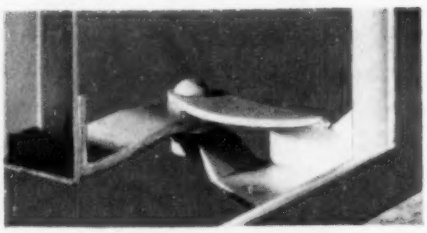
Main Apollo gas water heater

HOPE'S standard windows

FIRS ESTATE, CHESTER ROAD, CASTLE BROMWICH, BIRMINGHAM

A. G. Sheppard Fidler, M.A., B.Arch., F.R.I.B.A., A.M.T.P.I., City Architect

Long Life – minimum maintenance
First-class Fit – bronze fittings
No rust – hot-dip galvanized finish



Patent friction-held cleaning hinge holds casement firmly open in any position – no stay clutters the cill ☞

HOPE'S WINDOWS
The Name Guarantees

HENRY HOPE & SONS LTD
SMETHWICK, BIRMINGHAM
LONDON: 17 BERNERS ST., W.1

Send for List 397

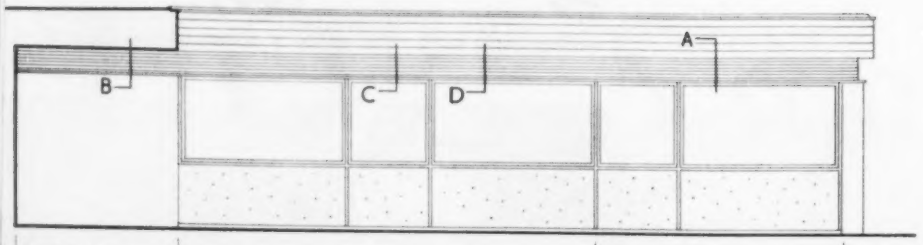
AJ SfB **(35)**

Working Detail No 12 UDC 69·028·3 Screens, louvres: General

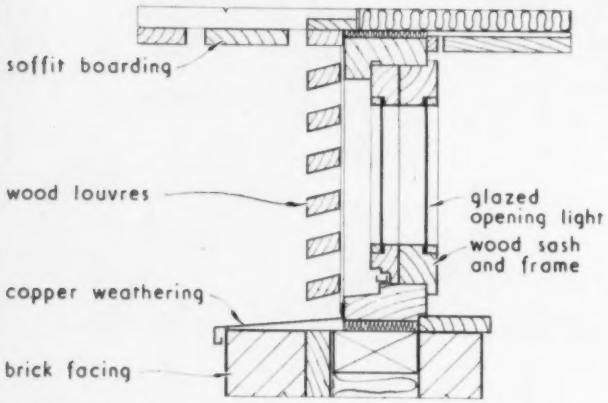
Louvred clerestory: House in Helsinki

Bertel Grippenberg, architect (material supplied by H. S. Sami)

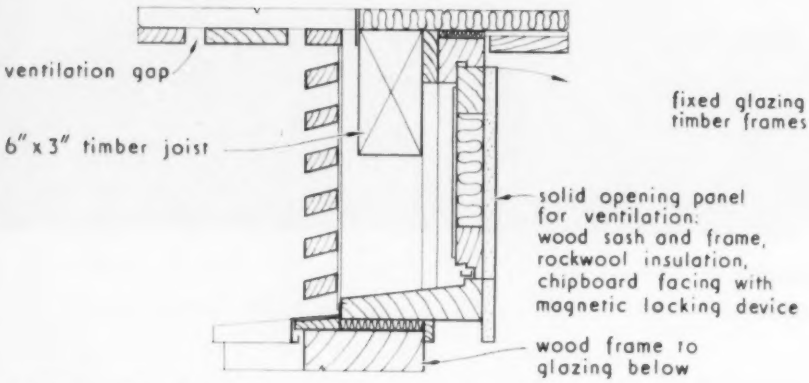
This detail shows the use of a continuous band of wood louvres below the eaves. These louvres cover, in some places, a clerestory light, in others a solid (but removable) ventilation panel. In other parts the louvres are decorative only and back on to a solid wall. These louvres enable a bungalow to be continuously ventilated while the owners are away without loss of security. Note also the use of timber clapboarding on the fascia. This seems a very serviceable finish for so exposed a position on the façade



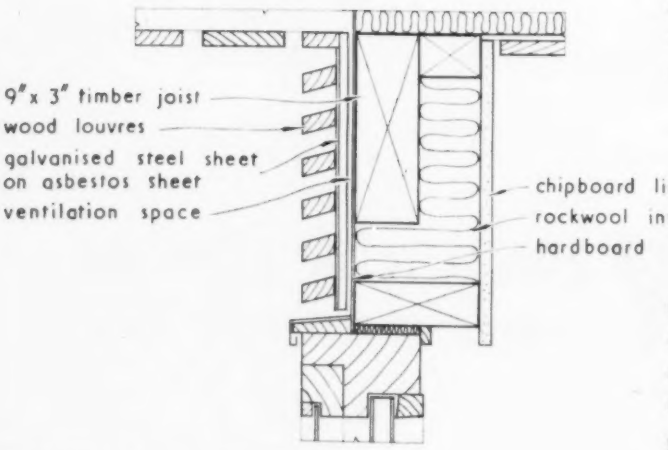
ELEVATION. scale 1/8" = 1'-0"



DETAIL AT B.

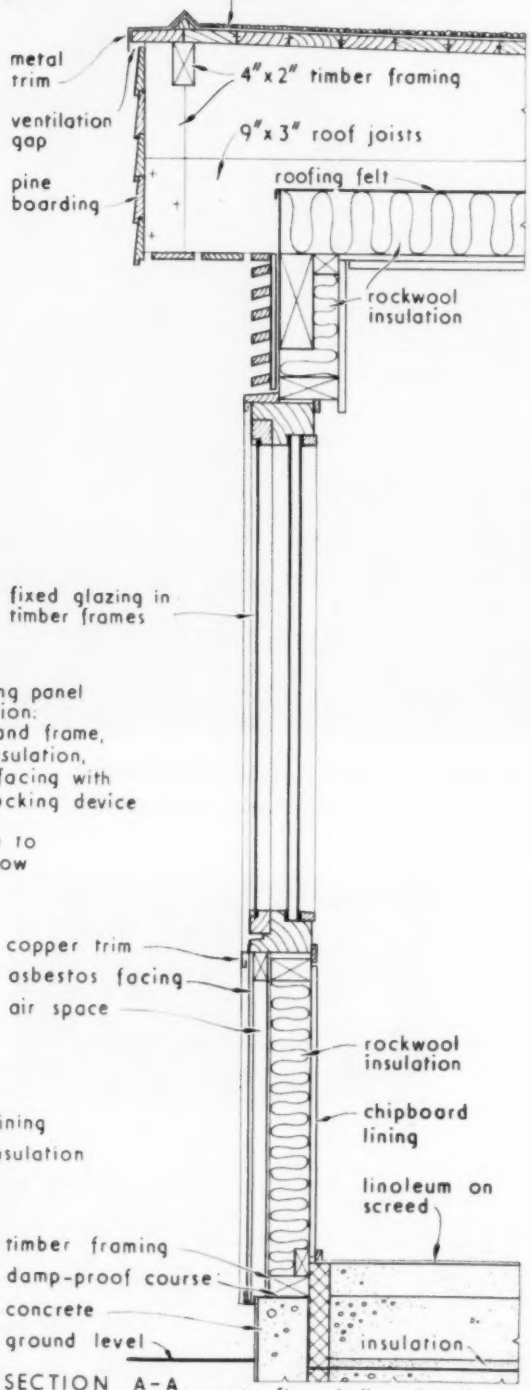


DETAIL AT C.



DETAIL AT D. scale 1 1/2" = 1'-0"

A



SECTION A-A.
scale 3/4" = 1'-0"

note: figured dimensions in feet and inches are approximate

AJ **SfB Aa2**

Index to Cost Analyses **UDC 05**

Index to AJ Cost Analyses 1957-1961

Buildings are grouped under types; main types are listed in alphabetical order

Type of building	*Architect*	*Date*
Warehouse and offices, Nottingham	J. M. Austin-Smith & Partners	18.4.57
Warehouse, workshop and offices, Dublin	Michael Scott	5.6.58
Nine Elms Lane, London SW8	J. M. Austin-Smith & Partners	30.10.58
Depot and offices, Leeds	T. Trepess	4.6.59
OFFICES (92) 725.23		
High Street, Sidcup	Huckle & Durkin	15.8.57
Heath Road, Twickenham	Ministry of Works	7.11.57
British Railways office, Cambridge	H. H. Powell	23.1.58
St James' House, Edgbaston	John Madin	10.4.58
Armour House, Liverpool	Robert Gardner-Medwin with Stephenson, Young & Partners	6.11.58
Pembroke House, City Road, London EC1	Morris de Metz	3.3.60
Ruislip Road, Greenford	Clive Pascall & Peter Watson	10.3.60
Marylebone Road, London NW1	Gollins, Melvin, Ward & Partners	24.3.60
West Howe, Bournemouth	Farmer & Dark	13.10.60
Computer building, Worthy Down, Winchester	D. E. E. Gibson, director general of works, War Office, with Robert Matthew & Johnson-Marshall	9.2.61
Department of architecture and planning, Coventry	Arthur Ling, city architect	13.4.61
Neasden, London NW10	Dennis E. Pugh	27.9.61
Motherwell, Lanarkshire	Keppie, Henderson & Partners	11.10.61
POLICE BUILDINGS (92) 725.188		
HQ, Earls Court Road, London	J. I. Elliott	9.5.57
HQ, Hull	Priestman & Lazenby	3.10.57
HQ, Coventry	Arthur Ling, city architect	8.1.59
PUBLIC BATHS (95) 725.73		
Slipper baths, Coventry	Arthur Ling, city architect	29.9.60
PUBLIC BUILDINGS: Miscellaneous		
Law courts, Slough, Bucks (92) 725.15	F. B. Pooley, county architect	26.12.57
RESIDENTIAL BUILDINGS		
Hostels (98) 728.54		
Students' hostels, Loughborough, Leics	T. A. Collins, county architect	22.9.60
Nurses' home, Bellshill, Lanarkshire	Gillespie, Kidd & Coia	27.10.60
Weeks Hall, London SW7	Richard Sheppard, Robson & Partners	10.11.60
Building for undergraduates, St John's College, Oxford	Architects' Co-Partnership	17.11.60
Hotels (98) 728.5		
The Dover Stage, Dover	Louis Erdi	8.8.57
Washington Hotel extension, London W1	Bronek Katz & R. Vaughan	22.1.59
Houses (private) (98) 728.3		
Scarborough, Yorks (conversion)	J. G. L. Poulson	10.1.57
Birch Lane, Purley, Surrey	R. G. R. Haggard	26.9.57
Thames Ditton, Surrey	Michael Lyell	26.9.57
Studio House, Hampstead	R. W. Trebilcock	12.12.57
Edwalton, Notts	Paul Ritter	12.12.57
Newstead Abbey, Notts	Bartlett & Gray	13.3.58
Old Windsor, Berks	F. W. Lancester	13.3.58
Oxted, Surrey	Quentin Hughes	13.3.58
Rickmansworth, Herts	Dore & Wurr	26.6.58
Reigate Heath, Surrey	John Stammers	26.6.58
Dorking, Surrey	Gerald F. Jones & Sykes	26.6.58
House and surgery, Stevenage, Herts	Stirling and Margaret Craig	26.6.58
Staines Green, Hertford	Glyn Davies	16.10.58
Great Missenden	R. Pinck & Peter McKinley	16.10.58
Diss, Norfolk	J. Fletcher Watson	16.10.58
Colchester, Essex	J. F. C. Brand	16.10.58
Cramond Road North, Edinburgh	Morris & Steedman	1.1.59
Cuilfail, Lewes, Sussex	Russell Diplock Associates	19.3.59
Stanmore Hill, Middlesex	H. J. Montague	20.8.59
Abington, Cambridgeshire	Hughes & Bicknell	17.9.59
Dunbar, East Lothian	Michael Laird	28.1.60
Lasswade, near Edinburgh	Morris & Steedman	28.1.60
Near Tunbridge Wells, Kent	Brian Peake	11.5.61
Speculative houses, Helensburgh, Scotland	T. G. Humphreys	6.9.61
Padworth Common, Berks	Raymond Lockyer	25.10.61
Housing (local authority flats, houses, maisonettes) (98) 728.1		
Claremont Estate, West Ham, London E15	T. E. North, borough architect	17.10.57
Demonstration maisonettes, Canterbury, for Ministry of Housing and Local Government	John L. Berbiers, city architect	27.3.58
Millpool Hill Estate, Birmingham	A. G. Sheppard Fidler, city architect	17.4.58
Alton Estate, Roehampton	Hubert Bennett, architect to London County Council	5.11.59
Fountain Square, Gloucester	J. V. Wall, city and county architect	12.11.59
Sceaux Gardens, Camberwell, London SE5	F. O. Hayes, borough architect	7.1.60
Camberwell Grove, London SE5	F. O. Hayes, borough architect	28.4.60
Hide Place development, Westminster, London SW1	Stillman & Eastwick-Field	23.6.60
Houses, Basildon, Essex	A. B. Davies, Development Corporation architect	11.8.60
Bowater House, Golden Lane, London EC1	Chamberlin, Powell & Bon	29.12.60
High flats for Southgate Borough Council, London N1	David du R. Aberdeen & Partners	23.3.61
Park Hill redevelopment, Sheffield	J. L. Womersley, city architect	23.8.61
Brecknock Road, London N1	J. M. Austin-Smith & Partners	4.10.61
Brandon Estate, Southwark, London SE1	Hubert Bennett, architect to London County Council	1.11.61
Flats, Stevenage, Herts	John Morton	22.11.61
SHOPS (92) 725.21		
Furniture shop, Bromley, Kent	Bertram Carter	5.12.57
Shops in Above Bar Street, Southampton	Oliver Carey	20.3.58
Department store, Cardiff	T. Alwyn Lloyd & Gordon	18.8.60
SHOPS AND FLATS OR OFFICES (92) 725.22		
Shops and maisonettes, Coventry	Arthur Ling, city architect	21.2.57
Offices and showrooms, Duxford	Westwood, Sons & Partners	14.1.60
Shops and flats, Berwick Street, London W1	Riches & Blythin	18.10.61
SPORTS BUILDINGS (95) 725.7/.8		
Werneth Golf Club extension, Oldham	George A. Hayes	5.9.57
Sports pavilion, Hayes, Kent	Pite, Son & Fairweather	27.2.58
Sports pavilion, Acton, London W3	Hening & Chitty	27.2.58
Cricket pavilion, Oundle School	Hughes & Bicknell	27.2.58
Swimming baths, Hornchurch, Essex	Vincent Williams, council engineer	27.11.58
Empire Pool, Cardiff	John Dryburgh, city architect, in succession to E. C. Roberts, city surveyor	27.11.58
TRANSPORT BUILDINGS (93) 725.3		
Garage and service station, Harlow	Ramsey, Murray, White & Ward	29.8.57
Hangar, offices and workshops, Gatwick Airport	Clive Pascall & Peter Watson	13.11.58
Service station and showroom, Poole	Farmer & Dark	24.9.59
Service station, Knaphill, Surrey	Wells & Hickman	22.10.59
Service station, Canterbury	Robert Paine & Partners	14.4.60
Harlow Town station, Essex	H. H. Powell & A. K. Terriss	15.12.60

AJ SfB Ba7

Prices **UDC 69·003·121 Economics: Surveyors' estimating and analysis**

Current wage rates, market prices and measured rates

The prices are prepared by Davis, Belfield & Everest, chartered quantity surveyors

Wage rates

Rates of wages as from October 2 1961 are as follows:

	Craftsmen		*Labourers*	
	s	d	s	d
London District	5	7½	5	0
Liverpool and District	5	7½	5	0
Grade classification A	5	6	4	10½

Market prices

Prices are given for the major items in each trade, they are intended as average prices and include delivery in the London area. They do not include overhead charges and profit.

Measured rates

Prices which are intended to be average for work carried out in the London area include 10% to cover overhead charges and profit except in the case of work which would be carried out by specialists when 5% has been allowed.
The prices given in italics represent the total value of the materials included in the measured rates, including an allowance for waste and 10% for overhead charges and profit. The cost of labour included in the measured rates (including its proportion of overhead charges and profit) can be ascertained by subtracting the prices in italics from the prices in heavier type.

Abbreviations

Inches: in. Feet: ft. Yards: Y. Yards cube: YC. Yards super YS. Feet cube: FC. Feet super: FS. Ton: T. Feet run : FR. Thousand: M. Square: Sq. Number: No. Hundredweight: C. Pound: lb. Gallon: Gal.

Preliminaries

To all estimates based on prices for measured rates add, if required, for Preliminaries, water, insurances, etc., depending on the nature of the job.

Price changes

* Shows changes in market prices and measured rates since the last issue (October 25 1961).

EXCAVATOR

		s	d
Market prices			
Carting away, up to 8 miles	YC		
Hand loaded		7	8
Machine loaded		6	8
Hardcore	YC	10	6
Measured rates			
Hand excavation and disposal			
NB: the following are applicable to excavation in heavy soil.			
Excavating over site to remove top soil and vegetable matter, 6 in. deep	YS	1	6
As above, 12 in. deep	YS	3	0
Excavating over site to reduce levels and getting out	YC	12	0
Excavating for basement and getting out	YC		
Depth up to 5 ft.		13	6
Depth between 5 & 10 ft.		19	6
Depth between 10 & 15 ft.		25	6
Excavating surface trenches and ditto	YC		
Depth up to 5 ft.		16	6
Depth between 5 & 10 ft.		22	6
Depth between 10 & 15 ft.		28	6
Excavating basement trenches and ditto	YC		
Commencing 5 ft below existing ground level		22	6
Commencing 10 ft. below existing ground level		28	6
Commencing 15 ft. below existing ground level		34	6
Add to excavation for:			
Basketing out and depositing	YC	12	0
Underpinning in trenches in short lengths	YC	9	0
Isolated pier holes, etc.	YC	6	0
Breaking up existing brick foundations	YC	40	0
Breaking up existing concrete foundations	YC	53	3
Wheeling surplus excavated material not exceeding 100 yards and depositing	YC	6	0
Add to last for:			
Roughly spreading and levelling	YC	1	10
Spreading, levelling and consolidating to make up levels	YC	3	11
Returning, filling-in and well ramming excavated material around foundations	YC	5	3
Loading surplus material into lorries and carting to tip, not exceeding 8 miles	YC	16	6
Excavating from soil heaps selected top soil, wheeling not exceeding 100 yards, and spreading, levelling and consolidating, not exceeding 6 in. to receive turf	YS	3	1

EXCAVATOR—continued

		s	d
Mechanical excavation and disposal			
Excavating for shallow surface excavation and loading into lorries or dumpers (using ⅜ yd. cube excavator)	YC	3	1
Excavating for surface excavation and removing, spreading and levelling not exceeding 200 yds. (using 6 yd. cube scraper)	YC	3	0
Removing excavated material and depositing, not exceeding 200 yds. (using 3 yd. cube dumper)	YC	2	3
Planking and strutting			
Planking and strutting to sides of surface or basement excavation	FS		
Depth up to 5 ft.			10
Depth up to 10 ft.		1	0
Depth up to 15 ft.		1	2
Planking and strutting to sides of surface and basement trenches	FS		
Depth up to 5 ft.			2
Depth up to 10 ft.			3½
Depth up to 15 ft.			4½
Planking and strutting underpinning in short lengths	FS	1	6
Timber left in excavation	FS	11	1
Hardcore			
Hardcore filled-in in layers, each layer well rammed	YC	22	2
		14	*5*
Bed of ditto, 4-in. thick	YS	3	9
		1	*7*

CONCRETOR

		s	d
Market prices			
Portland cement, 8 tons and over	T		
Normal setting		117	6
Rapid hardening		128	0
Washed, crushed and graded shingle	YC		
¾-in. down		20	6
1½-in. down		19	6
Sharp sand	YC	23	0
Hollow clay floor blocks to BS. 1190	M		
12-in. × 12-in. × 4-in.		769	0
12-in. × 12-in. × 6-in.		1052	0
12-in. × 12-in. × 8-in.		1509	0
Mild steel rods to B.S. 785 delivered station in 10 ton lots	T		
1-in. diameter		818	1
¾-in. diameter		848	5
½-in. diameter		881	3
⅜-in. diameter		911	6
¼-in. diameter		992	4
Steel wire mesh fabric to BS. 1221	YS		
4·32 lb. per yd. super		*2	7½
6·57 lb. per yd. super		*4	0½
9·32 lb. per yd. super		6	2½

CONCRETOR—continued

		s	d
Measured rates			
Concrete			
Portland cement mass concrete in foundations, etc.	YC		
1 : 12, 1½-in. "all-in" aggregate		67	1
		42	*11*
1 : 3 : 6, 1½-in. aggregate		78	9
		54	*7*
1 : 2 : 4, ¾-in. aggregate		85	4
		61	*3*
1 : 1½ : 3, ½-in. aggregate		93	1
		68	*11*
Add for:			
Working around rod or mesh reinforcement	YC	6	0
Underpinning in short lengths	YC	18	0
Walls:	YC		
Not over 6-in. thick		30	0
6-in. to 12-in. thick		21	0
Over 12-in. thick		15	0
Columns:	YC		
Not over 72 sq. inches		57	0
72 to 144 sq. inches		45	0
Over 144 sq. inches		36	0
Suspended floors and roofs	YC		
Not over 4½-in. thick		24	0
4½-in. to 6-in. thick		21	0
6-in. to 12-in. thick		18	0
Beds:	YC		
Not over 4½-in. thick		12	0
4½-in. to 6-in. thick		9	0
6-in. to 12-in. thick		3	0
Hollow tile floors			
Hollow tile floor of clay blocks at 15-in. centres laid on formwork (measured separately), nibs filled in with concrete (1 : 2 : 4) and finishing top of tiles with bed of concrete 1½-in. thick including tamping around reinforcement (measured separately)	YS		
4-in. thick tiles		19	8
		11	*1*
6-in. thick tiles		23	10
		14	*2*
8-in. thick tiles		29	11
		19	*1*
Sundries			
Finishing concrete with trowelled face to receive linoleum	YS	1	6
Applying horizontal damp-proof membrane of Synthaprufe in two coats to surface of concrete and blinding with sand to form key	YS	5	6
		3	*10*
Supplying floor clips (p.c. 6d. each) and fixing	No.	1	2
Hacking face of concrete to form key	YS	2	0
Bush hammering face of concrete to expose aggregate, from	YS	8	5

CONCRETOR—continued

		s	d
Formwork			
Formwork including strutting easing and striking:			
Vertical faces of foundation	YS	20	9
		10	2
Vertical faces of wall	YS	21	8
		7	3
Battering faces of walls	YS	27	8
		9	0
Soffit of floors	YS		
Not over 12-ft. high		21	4
		9	0
12-ft. to 14-ft. high		23	10
		11	6
Sloping soffit of stairs	YS	25	10
		9	10
Sides of columns	FS	2	10
			11
Sides and soffits of lintels and beams	FS	3	0
		1	1
Add to the above for wrot formwork including rubbing down concrete	YS	3	0
Reinforcement			
Mild steel rods to BS 785, hooked, bent, tied and fixing	C		
1-in. diameter		67	9
		49	10
⅜-in. diameter		71	2
		51	7
½-in. diameter		77	2
		53	6
⅝-in. diameter		84	8
		55	3
¼-in. diameter		100	0
		60	0
Steel wire mesh fabric to BS 1221 and fixing	YS		
4·32 lb. per yd. super		*3	11
		3	2
6·57 lb. per yd. super		*5	9
		4	10
9·32 lb. per yd. super		8	9
		7	6
Precast concrete			
Precast concrete (1 : 2 : 4) finished fair on exposed faces and hoisting setting and jointing:			
4½-in × 6-in. lintels reinforced with one ½-in. rod	FR	3	1
		2	6
4½-in. × 9-in. ditto with two ½-in. rods	FR	4	7
		3	8
Piling			
Reinforced pre-cast concrete piles, approximate prices for supplying, unloading, pitching and driving			
12-in. × 12-in. up to 30 ft. long	FR	25	0
14-in. × 14-in. up to 50 ft. long	FR	35	0
Sheet steel piling, ditto	T	1165 to 1230	0 0

BRICKLAYER

			s	d
Market prices				
Soft sand	YC	20	0	
Hydrated lime	T	122	0	
Plain flettons	M	130	0	
Second hard stocks	M	352	4	
Lingfield engineering wire cuts Grade B	M	286	0	
Hessian base damp-course to BS 743	YS	4	4½	
Damp course slates, 14-in. × 9-in.	100	80	6	
Wall ties, galvanised	100	17	3	
Partitions				
Clinker concrete, solid	YS			
	2½-in.	5	7	
	3-in.	7	1	
	4¼-in.	9	4	
Thermalite	YS			
	2½-in.	7	0	
	3-in.	8	5	
	4-in.	11	0	
	6-in.	16	6	
Hollow clay	YS			
	2½-in.	4	7	
(6 cavity)	3-in.	5	9	
(ditto)	4-in.	7	3	
Normal quality wood wool slabs	YS			
	2-in.	8	10	
	2½-in.	10	2	
	3-in.	11	5	
Measured rates				
Reduced brickwork in cement lime mortar, Lingfields in cement mortar	YS			
Flettons		38	1	
		19	2	
Second stocks		62	0	
		43	1	
Lingfield Grade B		58	3	
		36	6	
Half brick wall ditto	YS			
Flettons		21	1	
		9	1	
Second stocks		33	1	
		21	1	
Lingfield Grade B		31	10	
		17	8	
11-in. hollow wall with 2-in. cavity and wall ties	YS			
Flettons		45	11	
		18	7	
Second stocks		69	10	
		42	6	
One brick wall built fair and pointed both sides	YS			
Flettons		45	10	
		19	2	
Second stocks		69	10	
		43	1	
Lingfield Grade B		64	9	
		36	6	
Sundries				
Extra for internal fair face and flush pointing	YS	1	8	
Cutting, toothing and bonding new work to old	FS	6	3	

BRICKLAYER—continued

		s	d
Damp-proof courses			
Horizontal damp-proof course of two courses of slates and bedding and pointing	FS	4	7
		2	6
Horizontal damp-proof course of hessian base bitumen and laying on brick walls	FS		10
			7
Horizontal damp-proof course of lead lined hessian base bitumen and laying on brick walls	FS	1	9
		1	6
Facings			
Extra over ordinary brickwork with bricks P.C. 130s. per 1,000 for facings as described			
To solid wall in Flemish bond	YS		
Facings P.C. 250s. per M		15	9
		8	5
Facings P.C. 350s. per M		23	1
		15	8
Facings P.C. 450s. per M		30	4
		23	0
To cavity wall in stretcher bond	YS		
Facings P.C. 250s. per M		13	2
		6	5
Facings P.C. 350s. per M		18	9
		12	0
Facings P.C. 450s. per M		24	3
		17	6
Half brick wall in facings built fair and pointed on one side	YS		
Facings P.C. 250s. per M		33	0
		16	2
Facings P.C. 350s. per M		38	7
		21	9
Facings P.C. 450s. per M		44	2
		27	4
Partitions			
Clinker concrete solid partition blocks and setting in cement lime mortar	YS		
2½-in.		13	0
		6	11
3-in.		15	9
		8	9
4¼-in.		20	0
		11	6
Thermalite ditto	YS		
2½-in.		13	5
		8	7
3-in.		15	11
		10	4
4-in.		20	3
		13	5
6-in.		28	5
		19	11
Hollow clay ditto	YS		
2½-in.		11	10
		5	9
(6 cavity) 3-in.		14	3
		7	3
(ditto) 4-in.		17	7
		9	1
Wood wool slabs ditto	YS		
2-in.		14	9
		10	6
2½-in.		17	1
		12	2
3-in.		19	5
		13	9

DRAINLAYER

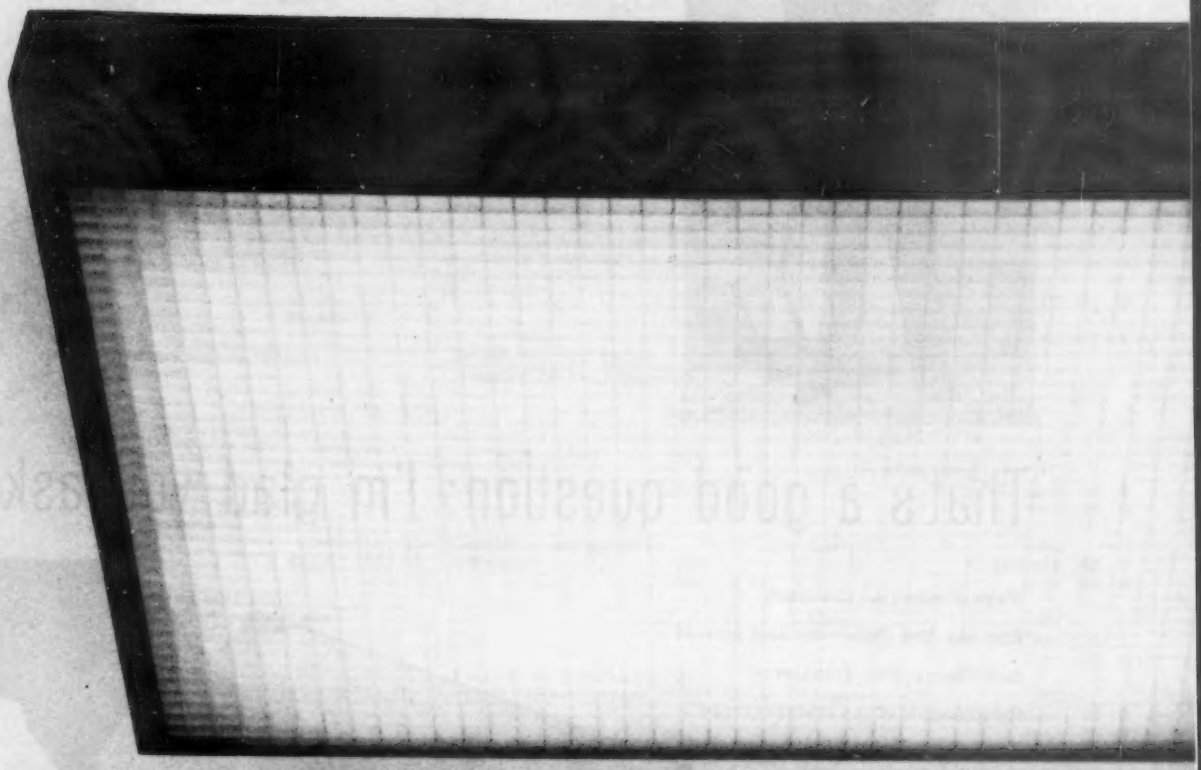
		s	d
Market prices			
Salt glazed stoneware pipes and fittings, "Best" quality:			
Ordinary pipes	FR		
	4-in.	1	7
	6-in.	2	4½
	9-in.	4	3½
Bends	No.		
	4-in.	4	9
	6-in.	7	1½
	9-in.	19	3
Pitch fibre pipe	FR		
	3-in.	1	10¾
	4-in.	2	6
	6-in.	5	0¾
Cast iron spigot and socket pipe to BS 437	YR		
	4-in.	31	1
	6-in.	45	6
	9-in.	85	2
Spun iron spigot and socket pipe to BS 1211, Class B	YR		
	4-in.	14	5
	6-in.	22	7
	9-in.	37	9
Measured rates			
Trenches and beds			
Excavate trenches by hand in heavy soil, including planking and strutting, part returning, filling and ramming and wheeling and spreading surplus, for pipes 4-in., 6-in. and 9-in. dia.	YR		
Average depth of trench	3-ft.	19	10
	4-ft.	26	6
	6-ft.	45	3
	9-ft.	83	9
Excavate trench as last but by mechanical trencher	YR		
Average depth of trench	3-ft.	14	8
	4-ft.	20	3
	6-ft.	36	3
	9-ft.	60	3
6-in. concrete bed and benching for:	YR		
4-in. diameter pipes		10	11
		6	7
6-in. diameter pipes		12	8
		7	8
9-in. diameter pipes		15	5
		9	3
6-in. concrete bed and surround for:	YR		
4-in. diameter pipes		17	8
		10	8
6-in. diameter pipes		21	4
		12	10
9-in. diameter pipes		26	11
		16	2
Stoneware drains			
"Seconds" quality salt-glazed stoneware drain pipes and laying and jointing in trench	FR		
	4-in.	2	6
		1	8
	6-in.	3	7
		2	5
	9-in.	5	10
		4	5

DRAINLAYER—continued

		s	d
"Best" quality salt-glazed stoneware drain pipes and laying and jointing in trench	FR		
	4-in.	2	10
		1	11
	6-in.	4	0
		2	10
	9-in.	6	7
		5	2
Extra over "Seconds" quality pipes for:			
Bend	No.		
	4-in.	3	10
		3	2
	6-in.	5	6
		4	9
	9-in.	15	10
		14	11
Single junction	No.		
	4-in.	6	8
		4	10
	6-in.	9	6
		7	4
	9-in.	20	1
		17	7
Double junction	No.		
	4-in.	11	2
		8	1
	6-in.	15	10
		12	3
	9-in.	30	9
		26	6
Stoneware gullies			
Salt-glazed trapped gully with galvanised grating including setting gully on and surrounding with concrete and jointing to drain	No.		
6 in. × 6 in. grating 4 in. outlet		26	11
		21	11
9 in. × 9 in. grating 6 in. outlet		49	2
		42	10
Grease and mud gully 9-in. diameter with 4-in. outlet galvanised bucket and grating and setting gully on and surrounding with concrete and jointing to drain	No.	92	9
		79	9
Road gully with 6-in. outlet including setting on and surrounding with concrete and jointing to drain	No.		
15-in. dia. 30-in. deep		125	6
		99	1
18-in. dia. 48-in. deep		250	2
		206	5
Pitch fibre drains			
Pitch fibre drain pipes and laying and jointing in trench	FR		
	3-in.	2	3
		2	1½
	4-in.	3	0
		2	9½
	6-in.	5	11
		5	8
Extra over pitch fibre pipe for 45° sweep bend	No.		
	3-in.	10	1
		9	1
	4-in.	14	7
		13	7
	6-in.	27	9
		26	7

DRAINLAYER—continued

		s	d
Cast iron drains			
Cast iron spigot and socket drain pipes and laying and jointing in trench	FR		
	4-in.	14	7
		12	0
	6-in.	21	1
		17	10
	9-in.	40	2
		33	4
Spun cast iron spigot and socket drain pipes and laying and jointing in trench	FR		
	4-in.	8	1
		5	8
	6-in.	12	1
		9	1
	9-in.	21	10
		15	3
Extra over cast iron pipes for:			
Bend	No.		
	4-in.	33	8
		26	4
	6-in.	78	6
		67	7
	9-in.	200	3
		181	6
Branch	No.		
	4-in.	52	1
		43	10
	6-in.	116	0
		103	7
	9-in.	280	0
		262	4
Cast iron gullies			
Cast iron gully trap with high invert and setting on and surrounding with concrete and jointing to drain	No.		
	4-in.	49	8
		39	5
	6-in.	120	6
		105	6
	9-in.	266	7
		246	4
Cast iron inspection fittings			
Branch with one branch each side	No.		
	4-in.	193	3
		180	7
	6-in.	305	5
		286	8
	9-in.	625	3
		596	10
Branch with two branches each side	No.		
	4-in.	311	10
		294	9
	6-in.	483	7
		458	6
	9-in.	980	4
		941	2
Manhole covers and frames			
Galvanised cast iron to BS 497 Grade C and bedding frame in cement and cover in grease			
Double seal flat	No.		
24-in. × 18-in.		128	10
		121	2
24-in. × 24-in.		198	4
		188	10
Double seal recessed	No.		
24-in. × 18-in.		135	7
		128	0
24in. × 24-in.		198	4
		188	10



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A new range of pendant and ceiling fluorescent fittings, designed by Paul Boissevain, for use in interiors where this fine hardwood will add a warm and natural quality.
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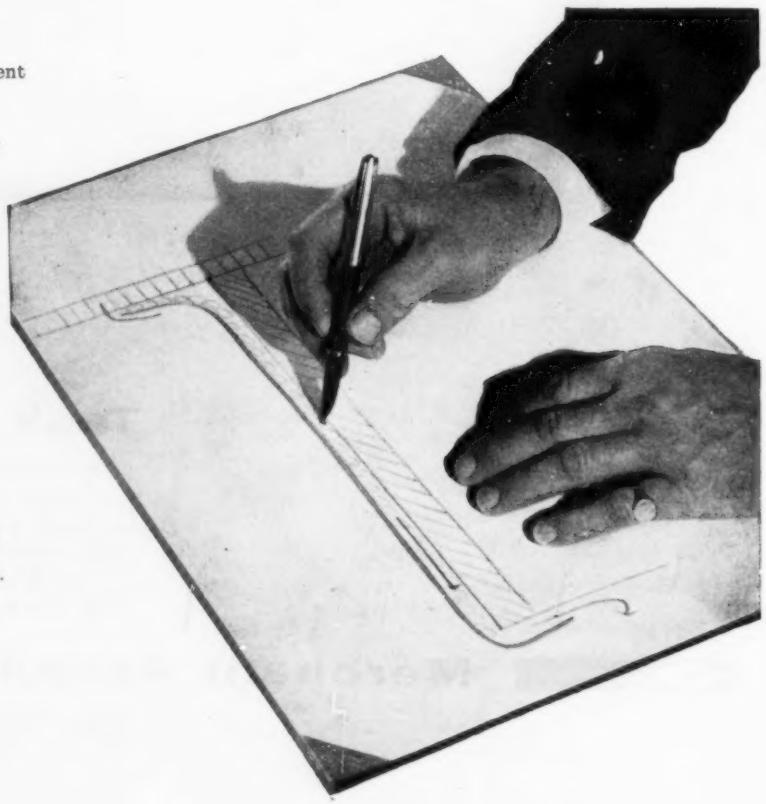

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RV659

ASPHALTER

		s	d
Measured rates			
Damp proof course and tanking			
½-in. vertical damp proof course in two thicknesses on brick or concrete	YS		
	BS1097	22	0
	BS1418	29	6
½-in. horizontal damp proof course in one thickness on brick or concrete	YS		
	BS1097	*12	6
	BS1418	*15	6
Vertical tanking in three thicknesses	YS		
	BS1097	*28	3
	BS1418	*36	9
Horizontal tanking in three thicknesses	YS		
	BS1097	*19	6
	BS1418	*29	6
Roofing			
¾-in. flat laid to falls in two thicknesses on and including felt underlay	YS		
	BS988	*14	3
	BS1162	*20	0
6-in. skirting with angle fillet at bottom and rounded edge at top turned into groove	FR		
	BS988	*2	7
	BS1162	*2	10
6-in. fascia with solid water check roll at top and undercut drip at bottom	FR		
	BS988	*4	9
	BS1162	*5	6
Flooring			
¾-in. asphalt flooring laid on prepared screed	YS		
	BS1076	*13	9
	BS1410	*20	3
⅜-in. brown asphalt flooring laid on prepared screed	YS		
	BS1451	*16	0
⅜-in. brown pitchmastic flooring laid on prepared screed	YS		
	BS1375	*14	3
Sundries			
Labour and material forming collars around pipes including angle fillet at bottom and rounded top edge	No.		
	Small pipe	5	3
	Large pipe	7	4
Labour warming up and jointing new to old flat	FR	1	1

PAVIOR

		s	d
Market prices			
Granite chippings, ¼ in. to dust	T	48	7
Red quarry tiles, 6 in. × 6 in. × ⅞ in.	YS	14	0
Noelite paving, 2-in.	YS	14	11
Measured rates			
Cement and sand floated screed to receive pavings	YS		
	¾-in.	4	7
		2	*5*
	1-in.	5	6
		3	*2*
	1¼-in.	6	2
		3	*8*
Cement and sand paving trowelled hard and smooth	YS		
	¾-in.	5	2
		2	*5*
	1-in.	6	1
		3	*2*
	1¼-in.	6	9
		3	*8*
Granolithic paving laid on concrete	YS		
	1-in.	7	11
		5	*5*
	1½-in.	10	1
		7	*1*
½-in. red composition paving laid on prepared screed	YS	16	6
⅜-in. terrazzo paving laid on prepared screed	YS	38	4
Sheet rubber flooring, plain and marble colours and laying	YS		
	7/64-in.	50	6
	⅛-in.	57	9
Sheet linoleum, plain colours and fixing with mastic	YS		
	3.2 mm.	22	0
	4.5 mm.	30	0
	6.7 mm.	41	3
⅛-in. thermoplastic tile flooring and laying-on screed	YS	9	3 to 16 6
Cork tile flooring, fixing with mastic and sealing	YS		
	⅛-in.	30	6
	5/32-in.	33	9
P.V.C. tile flooring and fixing with mastic	YS		
	2 mm.	40	0
	3 mm.	41	9
Vinyl tile flooring and fixing with mastic	YS		
	2 mm.	18	3
	3.2 mm.	25	0
Red quarry tiles laid on prepared screed	YS		
	⅜-in.	26	9
	½-in	30	0
2-in. Noelite paving laid on prepared bed, in random sizes and mixed colours	YS	22	0
		17	*3*
12 in. × 12 in. anchor steel plates laid complete	YS	61	6

MASON

		s	d
Market prices			
Stone in blocks in truckloads at stations in the London area:			
Beer	FC	10	10
Portland	FC	10	8
Woodkirk Blue building quality	FC	*21	3
Broughton Moor slate in blocks at stations in the London area	FC	60	0
Marble in blocks at works:			
Dove	FC	*80	0
Roman stone	FC	*72	0
Measured rates			
Stone and all labours, fixing and setting in mortar:			
Pilasters and quoins	FC		
Portland		66	9
Beer		63	6
Jambs	FC		
Portland		68	3
Beer		65	0
Lintels	FC		
Portland		70	3
Beer		67	0
Arches	FC		
Portland		86	0
Beer		82	0
Ashlar average 7-in. on bed with plain dressed face	FS		
Portland		36	6
Beer		34	9
Extra for each additional 1-in. thickness	FS		
Portland		4	10
Beer		4	7
4½-in. × 4-in. sill sunk, weathered, throated and grooved for water bar, set and jointed in cement mortar	FR		
Portland		13	2
Beer		12	6
Artificial		5	3
4-in. × 12-in. coping, weathered and twice throated set and jointed in cement mortar	FR		
Portland		26	0
Beer		24	8
Artificial		12	8
Steps and thresholds	FC		
Portland		64	0
Artificial		37	9
Marble and slate			
¾-in. plain polished linings and fixing on brick backings	FS		
Broughton Moor slate		27	3
Roman stone		*39	0
Dove marble		*40	0
Faience			
1¼-in. faience slabs and fixing on prepared brick or concrete backing	YS	120	0

SLATER, TILER AND ROOFER

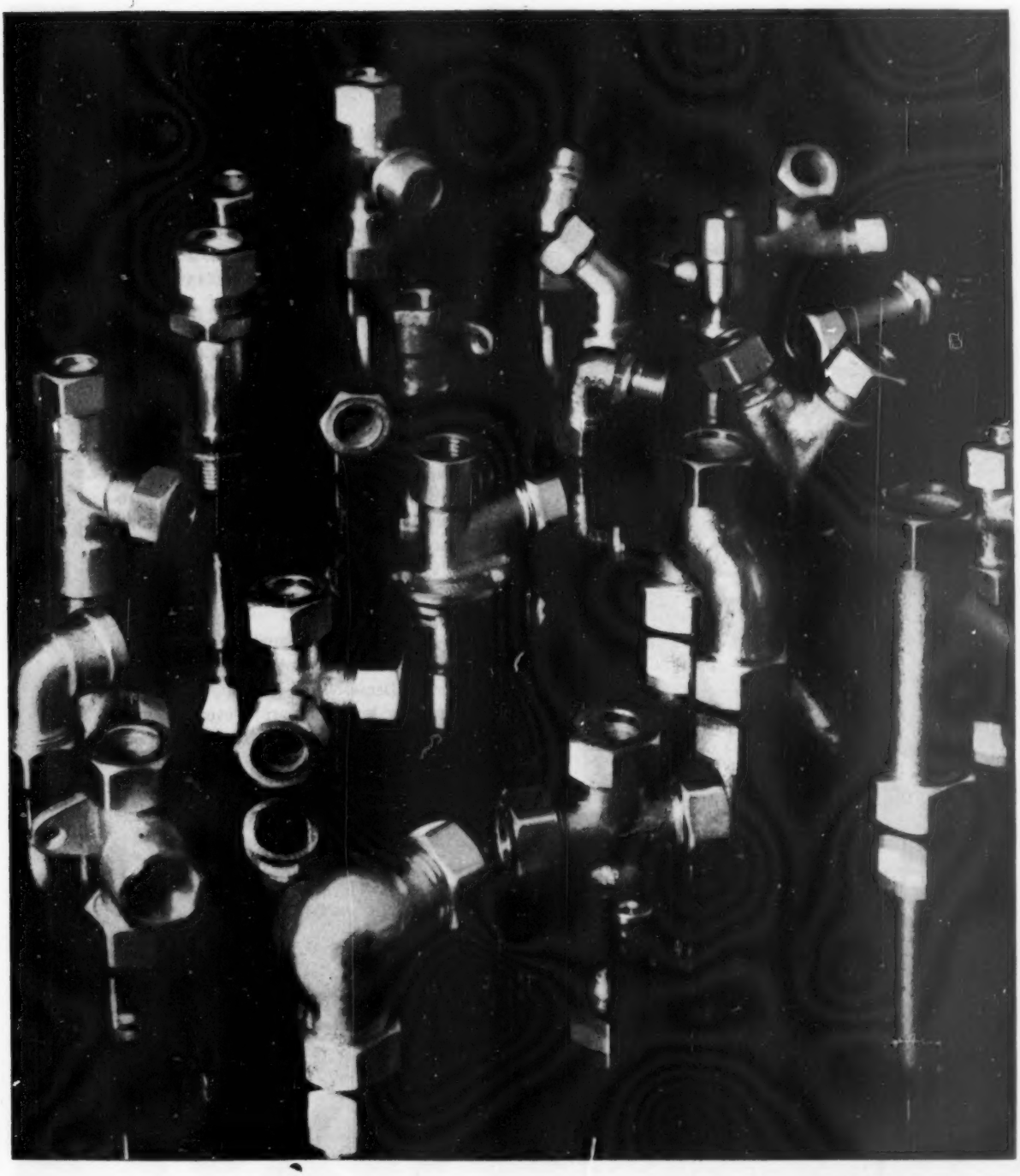
		s	d
Market prices			
Welsh slates, best quality	M		
16-in. × 10-in.	1087	9	
20-in. × 10-in.	2111	9	
Best hand made sand faced plain tiles, 10½-in. × 6½-in.	M	388	9
Plain concrete tiles, 10½-in. × 6½-in.	M	173	9
Interlocking concrete tiles, 15-in. × 9-in.	M	428	0
Grey corrugated asbestos cement sheets	YS	7	0
Measured rates			
Welsh slates laid to a 3-in. lap	Sq.		
16-in. × 10-in.		309	0
20-in. × 10-in.		431	0
Westmorland green slates in random sizes laid 3-in. lap	Sq.	713	0
Westmorland green slates hung vertically	Sq.	728	0
Best hand made sand faced plain tiles, 10½ in × 6½ in. laid to a 4-in. gauge	Sq.	260	0
Best hand made sand faced plain tiles, 10½ in. × 6½ in. hung vertically to 4½-in. gauge	Sq.	286	0
Plain concrete tiles, 10½-in. × 6½-in. laid to a 4-in. gauge	Sq.	127	6
Berkshire hand made sand faced red pantiles, 14½ in. × 10 in. laid 2½-in. head and 1½-in. side lap	Sq.	232	0
Interlocking concrete tiles, 15-in. × 9-in. laid to a 3-in. lap	Sq.	89	6
Grey corrugated asbestos cement sheets fixed to wood roofs	Sq.	125	0
Grey corrugated asbestos cement sheets fixed vertically	Sq.	136	0
Cedarwood shingles laid 5-in. gauge	Sq.	251	0
Metal roof decking and fixing with hook bolts, finished with ½-in. insulation board and three layers self finish felt roofing	YS		
18 gauge for spans up to 10 ft.		62	0
20 gauge for spans up to 8 ft. 6 in.		53	6
Two layer one ply bitumen felt and fixing with bitumen to concrete or boarding	YS	10	6
Three layer bitumen felt	YS	14	0
Nuraphalte thermoplastic roofing laid on prepared surface, for areas of 300 to 400 yd. super	YS	28	0
Patent ribbed aluminium roofing and fixing to purlins	Sq.	325	0

CARPENTER

		d
Market prices		
Softwood Std.		
Carcassing quality	1840	0
Joinery quality	2300	0
½-in. fibre board Sq.	46	6
⅛-in. standard hardboard Sq.	33	0
⅜-in. insulating gypsum wallboard YS	2	11
Measured rates		
Softwood and fixing		
In plates, sleeper joists and lintels FC	15	7
	13	*4*
In floor and ceiling joists FC	18	4
	13	*4*
In stud partitions, purlins and struts FC	20	11
	13	*4*
In hip and valley rafters FC	24	0
	13	*4*
Battening and boarding		
Slate or tile battens 1½ in. × ¾ in. and nailing to fixing for: Sq.		
16-in. × 10-in. slating to 6½-in. gauge	39	9
20-in. × 10-in. slating to 8½-in. gauge	29	9
10½-in. × 6½-in. plain tiling to 4-in. gauge	58	0
14½-in. × 10-in. pantiles to 12-in. gauge	21	0
S.E. boarding in batten widths close jointed and fixing to flat or sloping roofs Sq.		
½-in.	124	0
	85	*0*
1-in.	151	0
	112	*0*
T. & g. boarding in batten widths close jointed and fixing to flat or sloping roofs Sq.		
½-in.	145	6
	96	*0*
1-in.	176	0
	127	*0*
½-in. wrot and cross tongued eaves soffit FS	2	5
	1	*0*
½-in. × 6-in. wrot and grooved eaves fascia p.o. FS		11
		6
Wall and ceiling boards fixed to softwood YS		
¼-in. fibre board	7	0
	5	*0*
⅛-in. hardboard	5	4
	3	*8*
⅜-in. insulating gypsum wallboard	5	8
	3	*8*
7/16-in. asbestos cement flat sheeting	9	4
	4	*11*
½-in. asbestos cement flat sheeting	11	1
	6	*8*
2-in. Stramit, standard quality fixed to joists with butt joints	16	7
	11	*7*

JOINER

	s	d
Measured rates		
Floors and skirtings		
Tongued and grooved softwood flooring and nailing to joists Sq.		
⅞-in.	170	0
	124	*0*
1-in.	195	0
	149	*0*
1-in. nominal double grooved t. and g. block flooring set in mastic and polished YS		
Swedish softwood	30	9
European beech	33	6
African Muhuhu	*42	0
Burma teak	*46	3
Moulded skirtings, 3-in. to 6-in. sectional area planted on (per inch in sectional area) FR		
Softwood		3½
		2½
Oak		11
		10
Extra for grounds plugged to brickwork FR		
Softwood		11
		2
Windows		
2-in. rebated and moulded sashes divided into squares FS		
Softwood	4	2
Oak	13	10
Extra for side hanging Each		
Softwood	3	4
Oak	5	0
Doors		
2-in. framed, ledged and braced doors, filled in with 1-in. t. and g. and V jointed boarding and hanging FS		
Softwood	7	0
	6	*2*
Four panelled door square both sides and hanging FS		
Softwood	7	8
	6	*9*
Oak	23	8
	22	*5*
1⅜-in. Standard flush door, hardboard faced size 2 ft. 6 in. × 6 ft. 6 in. and hanging No.	48	6
	35	*2*
1¾-in. honeycomb core flush door lipped four edges, veneered faced with West African Cedar, size 2 ft. 6 in. × 6 ft. 6 in. and hanging No.	85	6
	72	*0*
Linings and frames		
Window and door linings, 6-in. to 12-in. sectional area (per inch sectional area) FR		
Softwood		4
		3
Oak	1	0
		10
Frames wrot all round and framed (per inch sectional area) FR		
Softwood		3½
Oak		11



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JOINER—continued

		s	d
Mullions, transomes and sills (per inch sectional area)	FR		
Softwood			4
Oak			11
Mouldings, architraves, etc., 4-in. to 6-in. sectional area (per inch sectional area)	FR		
Softwood			4
			3
Oak		1	1
		1	0
6-in. window boards, 1-in. thick with rounded nosing tongued at back and including bearers	FR		
Softwood		3	6
		1	10
Oak		6	4
		4	0
Shelving and fittings			
¾-in. shelving of 2-in. slats spaced 1-in. apart on bearers (measured separately)	FS		
Softwood		2	9
		2	1
¾-in. solid shelving on bearers	FS		
Softwood		2	7
		2	1
Oak		5	6
		4	10
2-in. shelf bearers plugged to wall	FR		
Softwood			8
			5½
Oak		1	6
		1	2
Staircases			
1-in. treads and ¾-in. risers tongued together on and including framed carriages	FS		
Softwood		5	4
		4	0
Oak		16	3
		14	5
1¼-in. × 11-in. wall string plugged to brickwork	FR		
Softwood		5	2
		3	11
Oak		13	10
		12	2
1¼-in. × 9-in. outer string	FR		
Softwood		4	0
		3	4
Oak		8	10
		7	11
Ends of treads and risers housed to strings	No.		
Softwood		1	6
Oak		8	7
2½-in. × 3-in. moulded handrail	FR		
Softwood		3	6
		2	9
Oak		8	2
		7	2
1¼-in. × 1¼-in. square balusters	FR		
Softwood			10
			7½
Oak		1	8
		1	4
Framed ends to balusters	No.		
Softwood			8
Oak			*11

IRONMONGER

		s	d
Market prices			
As prices for ironmongery vary so greatly depending upon the type and quality required, no prices are quoted here			
Measured rates			
The rates which follow are for **fixing only** and are inclusive of profit			
To softwood			
3-in. steel butts	Pr.	5	4
6-in. barrel bolts	No.	2	5
Cupboard locks	No.	5	0
Cylinder night latch	No.	8	4
Mortice latch	No.	6	8
Mortice lock	No.	8	4
Casement fastener	No.	2	0
To hardwood			
Add 33⅓% to above			

STEEL & IRON WORKER

Market prices				
Structural steel joist sections, basis sizes, ex mills, 50 ton lots	T	785	3	
Extras for other than basis sizes vary between 10s. and 70s. per ton				
Measured rates				
Rolled steel joists in steel framed structures hoisted and fixed complete	T	1700	0	
Rolled steel stanchions including caps, bases, cleats, etc.	T	1970	0	
Riveted compound girders including plates and rivets	T	2000	0	
Metal windows including cutting and pinning lugs to brickwork and bedding frames in cement mortar	No.			
Domestic type 4 ft. high to BS 990				
Type ND2F 3 ft. 3¼ in. wide		97	10	
		78	10	
Type HD2F 3 ft. 3¼ in. wide		108	10	
		89	10	
Type ND11F 6 ft. 6½ in. wide		167	5	
		133	10	
" Z " range, 4 ft. high				
Type ZND1 2 ft. 0¾ in. wide		65	10	
		53	2	
Type ZND4F 6 ft. 0¾ in. wide		170	0	
		136	5	
Curtain walling grid with proportion of opening lights, supplied and fixed excluding glazing and infill panels, approximate prices	FS			
Galvanised steel		25	6	
Aluminium		40	6	

PLASTERER

		s	d
Market prices			
Plastering sand	YC	23	0
Plaster to BS 1191 Class B in loads of 2 tons to 3 tons 19 cwt.	T		
Browning		171	0
Fibred browning		174	0
Board finish		171	0
Carlite plaster in loads of 2 tons to 3 tons 19 cwt.	T		
Undercoat		280	0
Finishing		235	0
⅜-in. plaster lath, over 600 yds.	YS	2	2½
6-in. × 6-in. × ¼-in. white glazed wall tiles	YS	19	0
Measured rates			
Metal lathing			
No. 24 gauge expanded metal lathing and fixing	YS		
To softwood soffits		7	4
		4	4
To metal		8	2
		4	4
28 BG steel angle bead to BS 1246, Figure 7, Profile C3, plugged to brickwork or partitions	FR	1	3
			5
Lime plaster			
Render float and set on brick walls and partitions	YS	8	3
		2	5
Render, float and set on concrete including hacking	YS	10	3
		2	5
Render, float and set on expanded metal lathing	YS	8	4
		2	7
Gypsum plaster			
Render in cement-lime-sand (1 : 1 : 6) and set in gypsum plaster on brick walls and partitions	YS	6	6
		2	0
Render in gypsum fibred browning-sand (1 : 1½) and set in gypsum on concrete soffits including bonding coat	YS	10	5
		3	8
Render and set on expanded metal lathing including pricking up coat	YS	9	10
		4	0
Lightweight plaster			
Render and set in lightweight plaster on brick walls and partitions	YS	8	0
		2	9
Sundries			
Labour arris	FR		6
Make good plaster up to metal bead	FR		2

PLASTERER—continued

		s	d
Plaster board			
⅜-in. gypsum plaster lath fixed to softwood soffits finished to receive plaster	YS	5	0
		2	9
Gypsum board finish setting coat on last	YS	4	10
		1	2
⅜-in. gypsum wall board fixed to vertical studding and scrimming joints	YS	6	1
		3	2
Wall screeds			
½-in. cement and sand screed on brick walls to receive tiling	YS	4	7
		1	6
Plain face			
½-in. Portland cement and sand (1 : 3) plain face trowelled smooth on brick walls	YS	7	6
		1	11
Tyrolean rendering			
Render in cement, lime, sand (1 : 1 : 6) and finishing with three coats patent coloured mix preparations applied with hand operated machine	YS	11	5
		2	6
Sprayed "Limpet" asbestos			
Approximate prices for sprayed "Limpet" asbestos on the following surfaces to the thickness shown for quantities of 1,000 yds. super. Normal pressed finish. New concrete soffits and beams	YS		
¼-in.		14	5
½-in.		19	8
1-in.		21	9
New structural steelwork	YS		
¼-in.		16	6
½-in.		21	9
1-in.		23	10
Extra over the above prices for coloured texture finish	YS	3	5
Wall tiling			
6-in. × 6-in. × ¼-in. glazed wall tiles set and jointed on prepared screed	YS		
Standard quality, white		47	6
Eggshell matt or glossy		58	0

PLUMBER

Market prices

		s	d
Sheet lead, 3½ lb. and upwards, in quantities of 5 cwt. to 1 ton	C	*102	3
Copper sheeting, 23 gauge, in 1-ton lots	C	326	0
Zinc sheeting, 14 gauge, in 1-ton lots	C	125	0
Aluminium sheeting 20 SWG	C		
Super purity		532	8
Commercial quality		345	4

PLUMBER—continued

		s	d
Cast iron rainwater and soil goods			
Medium weight pipe to BS 416 and BS 460 in 6 ft. lengths	No.		
3-in.		22	9
4-in.		29	0
Half round gutter in 6 ft. lengths	No.		
4-in.		11	2
6-in.		18	4
The above are Standard-List prices plus 32½%			
Lead pipe in quantities of 5 cwt. to 1 ton	C		
BS 602		109	0
BS 1085		116	0
Polythene tubing, heavy gauge	100 FR		
¼-in.		96	6
½-in.		131	6
1-in.		167	6
Steel tubes to BS 1387 medium weight galvanised	FR		
¼-in.		0	7¾
½-in.		0	9½
1-in.		1	1½
1¼-in.		1	5½
1½-in.		1	8½
The above are Standard List prices less 35%			
Galvanised malleable fittings. Bend	No.		
1-in.		3	0
1¼-in.		4	7
1½-in.		6	6
Tee	No.		
¼-in.		1	1
½-in.		1	6
1-in.		2	2
1¼-in.		3	0
1½-in.		4	4
The above are Standard List prices less 17½%, less 6¼% plus 40%			
Copper tubes to BS 659	FR		
¼-in.		1	0
½-in.		1	4½
1-in.		2	1½
1¼-in.		2	6½
The above are calculated on a basis price of 2s. 3¾d. per lb. plus diameter extras.			

Measured rates

		s	d
Milled sheet lead	C		
Flat roofs		*195	0
Gutters and flashings		*195	0
24 SWG copper sheet	FS		
Flat roofs		6	0
Gutters and flashings		6	0
23 SWG copper sheet	FS		
Flat roofs		6	8
Gutters and flashings		6	8
14 gauge zinc	FS		
Flat roofs		3	8
Gutters and flashings		3	8
20 SWG super purity aluminium	FS		
Flat roofs		5	6
Gutters and flashings		5	6
20 SWG commercial quality aluminium	FS		
Flat roofs		4	4
Gutters and flashings		4	4

PLUMBER—continued

		s	d
Rainwater gutters and pipes			
Half round eaves gutter jointed and fixed to fascia with brackets:			
Cast-iron, ⅛-in.	FR		
4-in.		3	10
		2	5
6-in.		5	8
		3	10
Pressed steel, 18g.	FR		
4-in.		3	6
		2	0
6-in		4	8
		2	10
Asbestos cement	FR		
4-in.		3	1
		1	7
6-in.		4	5
		2	7
Aluminium	FR		
4-in.		4	5
		2	11
Rainwater pipes jointed and fixed to walls with pipe nails:			
Cast iron, 7/16-in.	FR		
3-in.		6	6
		4	9
4-in.		8	1
		6	1
Pressed steel, 24g.	FR		
3-in.		4	11
		3	3
4-in.		7	0
		5	0
Asbestos cement	FR		
3-in.		4	0
		2	3
4-in.		5	1
		3	1
Aluminium	FR		
3-in.		5	9
		4	0
4-in.		7	8
		5	8
Soil and ventilating pipes			
Lead soil, waste and ventilating pipes fixed to walls with lead tacks at the following sizes and weights (lbs. per yd. run)	FR		
3-in.	15	*16	6
		7	10
4-in.	19	*20	9
		9	7
Cast iron soil, waste and ventilating pipes with caulked joints fixed to walls with pipe nails	FR		
3-in. heavy		7	10
		5	7
4-in. heavy		9	7
		7	0
Asbestos cement soil, waste and ventilating pipes with socketed joints made in caulked neat cement fixed to walls with holderbats	FR		
3-in.		4	1
		2	4
4-in		5	3
		3	2

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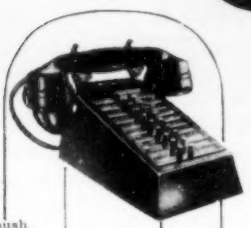

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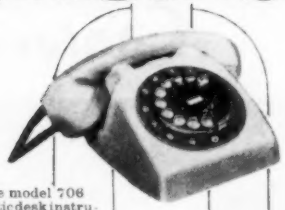

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PLUMBER—continued

Lead pipe to BS 602

Lead pipe at the following sizes and weights (lbs. per yd. run).

Supply pipe laid in trench (measured separately)	FR	s	d
½-in.	7	*3	8
		2	7
¾-in.	11	*5	4
		4	0
1-in.	16	*7	6
		5	11
1¼-in.	28	*12	8
		10	1
1½-in.	35	*16	4
		12	7

Supply pipe fixed to walls and ceilings	FR	s	d
½-in.	7	*4	3
		2	8
¾-in.	11	*6	1
		4	1
1-in.	16	*8	3
		6	0
1¼-in.	28	*13	5
		10	2
1½-in.	35	*17	8
		12	8

Distributing pipe fixed to walls and ceilings	FR	s	d
½-in.	4	*3	3
		1	7
¾-in.	5	*3	9
		2	0
1-in.	7	*4	10
		2	9
1¼-in.	9	*5	7
		3	7
1½-in.	12	*7	3
		4	10

Flushing and warning pipe fixed to softwood	FR	s	d
¾-in.	4	*2	6
		1	5
1-in.	5	*2	11
		1	9
1¼-in.	6	*3	5
		2	3
1½-in.	7	*3	9
		2	7

Waste pipe fixed to softwood	FR	s	d
1¼-in.	6	*4	2
		2	5
1½-in.	7	*4	7
		2	10

Joints to fittings	No.	s	d
½-in.		9	7
		2	0
¾-in.		11	10
		2	11
1-in.		14	1
		3	11
1¼-in.		16	4
		4	11
1½-in.		18	7
		5	11

Extra for:

Bend	No.	s	d
1¼-in.		2	3
1½-in.		3	2

Branch joints	No.	s	d
½-in.		11	6
		2	0
¾-in.		14	0
		2	11
1-in.		16	7
		3	11
1¼-in.		19	1
		4	11
1½-in.		21	9
		5	11

PLUMBER—continued

Polythene tubing to BS 1972

Heavy gauge polythene tubing

Supply pipe laid in trench (measured separately)	FR	s	d
½-in.		1	7
		1	1
¾-in.		2	0
		1	6
1-in.		2	5
		1	11

Supply or distributing pipe fixed to walls	FR	s	d
½-in.		2	6
		1	2
¾-in.		2	11
		1	7
1-in.		3	5
		2	1

Galvanised steel tubing to BS 1387

Galvanised steel tubing with screwed red lead joints.

Supply pipe, heavy weight, laid in trench (measured separately)	FR	s	d
½-in.		2	6
			10
¾-in.		2	9
		1	0
1-in.		3	2
		1	6
1¼-in.		4	6
		1	11
1½-in.		5	11
		2	3

Supply or distributing pipe, medium weight, fixed to walls	FR	s	d
½-in.		2	9
			10
¾-in.		3	3
		1	1
1-in.		3	8
		1	4
1¼-in.		4	9
		1	9
1½-in.		5	4
		2	1

Extra for malleable iron fittings

Elbow	No.	s	d
1-in.		8	4
		2	0
1¼-in.		11	6
		3	1
1½-in.		14	11
		4	2

Bend	No.	s	d
1-in.		9	8
		3	4
1¼-in.		13	5
		5	0
1½-in.		17	11
		7	2

Tee	No.	s	d
½-in.		5	0
		1	2
¾-in.		6	6
		1	8
1-in.		8	9
		2	5
1¼-in.		11	8
		3	4
1½-in.		15	7
		4	9

PLUMBER—continued

Copper tube

Copper tube at the following sizes and gauges

Supply pipe, BS 1386, laid in trench (measured separately)	FR	s	d
½-in.	18	1	7
		1	4
¾-in.	17	2	5
		2	2
1-in.	16	3	6
		3	2
1¼-in.	16	4	7
		4	3
1½-in.	15	6	0
		5	7

Supply or distributing pipe, BS 659, fixed to walls	FR	s	d
½-in.	19	2	3
		1	2
¾-in.	19	2	10
		1	8
1-in.	18	3	8
		2	6
1¼-in.	18	4	4
		3	0
1½-in.	18	5	2
		3	8

Extra for brass compression fittings, copper to copper

Coupling	No.	s	d
½-in.		5	6
		3	5
¾-in.		6	11
		4	2
1-in.		9	8
		6	2
1¼-in.		12	1
		7	11
1½-in.		16	6
		11	6

Bend	No.	s	d
½-in.		6	11
		4	9
¾-in.		8	7
		5	9
1-in.		12	3
		8	9
1¼-in.		15	4
		11	1
1½-in.		24	10
		19	11

Tee	No.	s	d
½-in.		10	2
		6	4
¾-in.		11	9
		7	4
1-in.		17	1
		11	11
1¼-in.		23	1
		17	3
1½-in.		34	5
		27	10

Heat insulation

Asbestos plastic insulation, wired, trowelled hard and smooth and painted	FR	s	d
½-in.		4	4
¾-in.		4	6
1-in.		4	10
1¼-in.		5	3
1½-in.		5	8

Sectional insulation with canvas sheeting and metal bands and painted	FR	s	d
½-in.		4	9
¾-in.		5	0
1-in.		5	4
1¼-in.		5	8
1½-in.		6	0

GLAZIER

		s	d
Market prices			
O.Q. sheet glass cut to size	FS		
	24 oz.	1	0⅛
	32 oz.	1	7½
¼-in. polished plate and float glass, glazing quality in plates not exceeding:	FS		
	2 ft. super	4	1½
	5 ft. super	5	0½
	45 ft. super	6	9
	100 ft. super	6	9
⅛-in. white figured rolled and cathedral glass	FS		
	Group one	1	3½
	Group two	1	9½
	Group three	1	8½
¼-in. Georgian polished wired glass	FS	6	10

Attention is drawn to reduction in certain glass prices offered by manufacturers for acceptance of specified minimum quantities of one size and substance delivered to one address at one time and this has been taken into account in the following rates

Measured rates

Glazing to wood

Glazing with putty in squares	FS		
24 oz. O.Q. sheet glass		1	4
32 oz. O.Q. sheet glass		1	9
⅛-in. rolled glass, group one		1	7
⅜-in. rough cast glass		2	1
¼-in. wired cast glass		2	5
¼-in. Georgian polished wired glass		8	0
¼-in. polished plate glass (glazing quality) in squares			
2 to 5 ft. super		6	11
5 to 45 ft. super		7	5

Glazing to metal

Add to above rates 1d. per ft. super			

Sundries

Hacking out broken sheet glass	FS	1	3
Black ribbon velvet and bedding to edge of glass	FR		8

Double glazing

Insulight units of two skins of glass with lead spacers and glazing with mastic or beads (supplied). In panels 10 to 25 ft. super	FS		
32 oz. sheet		10	11
¼-in. polished plate		22	3

Patent glazing

Patent glazing with ¼-in. Georgian wired cast glass suitable for 8-ft. spans	FS		
Rolled steel lead capped bars		*4	11
Aluminium alloy bars		*4	10

PAINTER

		s	d
Market prices			
Ceiling distemper	C	30	0
Washable distemper	C	130	0
General purpose priming	Gal.	36	6
Emulsion paint	Gal.	45	0
Hard gloss paint:	Gal.		
Undercoat		46	0
Finishing		46	0

Measured rates

On walls and ceilings

Twice whiten plastered ceilings	YS	1	7
			3
Two coats distemper on plastered walls or ceilings	YS	2	6
		1	1
Two coats distemper on fair-faced brick or concrete walls	YS	3	0
		1	4
Two coats emulsion paint on walls or ceilings	YS	3	1
		1	8
Prepare, prime and apply one coat oil colour on plastered walls	YS		
Basis price		3	11
		1	6
Add for each additional coat		1	10
			10

On metal

Prepare, prime and apply one coat oil colour			
General surfaces	YS		
Basis price		3	11
		1	6
Add for each additional coat		1	9
			10
Windows in squares	YS		
Basis price		5	8
			9
Add for each additional coat		2	4
			5
Bars, angles, etc., not exceeding 3-in. girth	YR		
Basis price			6
			2
Add for each additional coat			3
			1
Small pipes	YR		
Basis price		1	1
			3
Add for each additional coat			6
			2
Large pipes	YR		
Basis price		2	2
			6
Add for each additional coat			11
			3
Prepare, prime and apply one coat heat-resisting paint on heating surfaces of radiators	YS		
Basis price		4	9
		1	6
Add for each additional coat		2	2
			9

PAINTER—continued

		s	d
On wood			
Knot, prime, stop and apply one coat oil colour			
General surfaces	YS		
Basis price		4	5
		1	8
Add for each additional coat		1	9
			10
Margins of treads and risers	YS		
Basis price		5	1
		1	8
Add for each additional coat		2	0
			10
Work not exceeding 3-in. girth	YR		
Basis price			7
			1½
Add for each additional coat			2½
			1
Work 3-in. to 6-in. girth	YR		
Basis price			11
			2½
Add for each additional coat			4
			1½
Stain and varnish			
Prepare, size, stain and twice varnish on woodwork			
General surfaces	YS	4	10
		1	8
Work not exceeding 3-in. girth	YR		8
			1½
Work 3-in. to 6-in. girth	YR	1	0
			2½
Oiling and polishing			
Twice oiling hardwood with linseed oil			
General surfaces	YS	2	11
		1	2
Work not exceeding 3-in. girth	YR		3½
			1
Work 3-in. to 6-in. girth	YR		5
			1½
Staining and wax polishing general surfaces of hardwood	FS	1	2
Staining bodying-in and fully French polishing on general surfaces of hardwood	FS	2	10
Papering			
Preparing and sizing walls and hanging plain lining paper	Piece	12	0
		3	3
Hanging wall paper, p.c. 10s. per piece	Piece	22	1
		12	9
Hanging border, p.c. 1s. per yd.	YR	1	10
		1	3

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AJ SfB (23)

Floors, ground: General

Cecil Handisyde, author of this week's Element Design Guide, is well known for his work on the RIBA *textbook committee-sponsored* Building materials: science and practice. *He was for some years on the staff at the Building Research Station and is now a practising architect*

(23) *Floors, ground: General*

This Element File deals with solid floors bearing directly on the ground and suspended timber floors built off the ground. It does not include suspended concrete floors which are considered in detail in *SfB* (23) *Floors, structural: General.*

Floor finishes will be dealt with in section *SfB* (43) *Finishes, floor: General.* However, cement-type finishes such as granolithic, which may be integral with the concrete base, are considered here, also screeds intended as a finish or to receive a finish. The question whether a dpc membrane is needed is primarily related to floors on the ground and is therefore included. Underfloor heating is referred to in relation to the problem of thermal insulation but will be dealt with in detail in *SfB* (56) *Installations, heating: Equipment and fuel.*

The subject of floors on the ground is poorly covered in common reference books. Tradition and know-how appear to be the chief bases for design, and perhaps certain commonly accepted practices might well be critically reviewed. Some of these practices are referred to in the Technical Study.

Included in the file are Information Sheets on damp-proof membranes and thermal insulation.

AJ **SfB (23)**

Element Design Guide **UDC 69·025 Floors, ground : General**

(23) Floors, ground : General

Bibliographic references (third column) are graded as follows:

* General reference of value to every architect and which he may wish to possess.

** Specialised reference normally used by consultant or architects with special knowledge of particular aspects of building

*** Highly specialised references and research papers which would not be of value to the architect unless working with a consultant

Figures in square brackets are SfB references to the publications. References in **bold type** are to AJ Element Files

Data required

1 **Soil conditions**	Determine loadbearing capacity of ground including any made-up ground With pile foundations ground floor may be carried on pile beams as a fully suspended floor	**SfB (11) Ground: General** Element Design Guide para 8–11 *Information may have been obtained when considering Foundations* *BUILDING RESEARCH STATION Factory Building Studies No 5 Sites and foundations. 1960, HMSO [Ca] *Good general information on soil investigations and effect of loading on various soils*
	Check for possible underground features affecting loading: mine workings sewers and drains other services railways adjacent backfill	**SfB (11) Ground: General** EDG para 4
	Investigate presence of harmful chemicals which might affect concrete: sulphates contents of made-up ground	*BRS Principles of modern building: vol 1 p 92–93. 1959, HMSO, 3rd edition [Bb] *Precautions where concrete is exposed to sulphates*
	Consider possibility of soil stabilisation for certain projects	*HENRI, D. G. S. House foundations of stabilised soil: Report on experimental construction of foundations, Stourport-on-Severn. *The Builder*, 1956, 4 May, p 464–465 [(16)]
2 **Site drainage**	Will existing site drainage be interfered with? Is new site drainage needed to keep building dry? What is worst soil water level? Determine whether water pressure requires loading coat on top of dpc membrane	
3 **Soil tipping**	Consider how excavated material is to be disposed of: *on site, off site, in construction* relative to: *cost* *re-use of topsoil*	
4 **Hardcore**	What hardcore is likely to be available from: quarries, gravel pits slag, shale and industrial wastes local authority demolition contractors buildings on site to be taken down (*Price may affect level in large floor areas*)	*Principles of modern building: vol 2 p 58. 1961 [Bb]
5 **Loading**	Determine floor loading: NORMAL FOR TYPE OF BUILDING	*There is no good reference on heavy loads to be expected in industrial or special type buildings*
	PARTITIONS SPECIAL HEAVY LOADS from machines, materials, and boilers	*Principles of modern building: vol 1 p 8 [Bb] *Limited data on floor loading.*

	MOVING LOADS	*BRS Factory Building Studies No 4 Structural loading in factories. 1960, HMSO [Ab4] *Some discussion of machine loads*
	IMPACT LOADS	
	FUTURE LOADING	*Note: Factory and warehouse loadings are tending to increase*
	VIBRATION EFFECTS including possible transference of noise nuisance (may require consultant)	*BRS Factory Building Studies No 6 Noise in factories: p 11–14. 1960, HMSO [Ab9] *Anti-vibration mountings*, NOISE ABATEMENT ACT 1960 [Aa5] ***CROCKETT, J. H. A. Vibration control in machine foundations: parts 1, 2 and 3: *Insulation*, 1961, 5 (2) (March/April) p 87–89; 5 (3) (May/June) p 134–138; 5 (4) (July/August) p 183–185 [(33)]
6 **Floor drainage**	Is floor to be impermeable to take liquids from above? Are such liquids harmful to the floor including reinforcement? Are floor slopes required for drainage? (Smoothness of floor finish and type of liquid will affect requirements) Determine slope required Check need for floor channels and outlets	*BRS Digest 73 (first series) Corrosion resistant floors: part 1: Design considerations [(43)] *Useful guidance on floor slopes*
7 **Ducts**	Type of service to be carried Are underfloor ducts required, also depth and width? Will they require: *waterproofing* *draining* *ventilating*? Will waterproof covers be required? What type and size of access? Relationship to: *foundation* *dpc* *underground services*	*BRITISH STANDARDS INSTITUTION CP 413 (1951) Design and construction of ducts for services [(5)] *Good general information, some illustrations*
8 **Floor levels**	Determine relationship of:	
	ROADS AND PAVINGS	
	ADJACENT GROUND	
	EXISTING BUILDINGS	
	FUTURE BUILDINGS	
	LOADING DOCKS: road transport rail transport	*Height for road loading docks varies* *Height for rail is standard at 3ft above top of rails*
	DRAINAGE REQUIREMENTS (including drainage of ducts)	
	SOIL REMOVAL	
	SLOPING FLOORS	*BRS Digest 73 (first series) [(43)]
	UNDERFLOOR VENTILATION	See Regulations para 15 below
9 **Details of finish**	MATERIAL: eg cork, rubber, wood, pvc	**SfB (43) Finishes, floor: General**
	TYPE: eg sheet, tile, block	
	THICKNESS	
	FIXING: eg bitumen, pins, laid loose, in situ, adhesive	
	SENSITIVITY TO DAMP	*Manufacturers' recommendations*
	TOLERANCE IN LEVEL	
	CHANGES OF MATERIAL: may affect level or thickness of construction floor or screed	
10 **Floor openings**	Determine requirements for:	
	DRAINAGE OUTLETS	
	SERVICE OUTLETS AND ENTRIES	
	COLUMNS OR WALLS PENETRATING THE FLOOR	*Vibration conditions, or circumstances in which differential settlement may take place, will require isolation of floor*
11 **Thermal insulation**	Establish if required for:	
	STATUTORY REQUIREMENTS	Regulation is U value 0·25 for domestic. See also para 15 below
	PREVENTION OF HEAT LOSS	**BILLINGTON, N. S. Thermal properties of buildings p 44–49. London, 1952, Cleaver-Hume Press [Ab9]
	FLOOR HEATING. The ability of the floor to store heat and its rate of heat-up and cooling are related to thermal capacity of floor. Check suitable value for type of installation	*Principles of modern building: vol 2 chap 5 (Floor heating) [Bb] **INVISIBLE PANEL WARMING ASSOCI-

		ATION Panel heating. London, The Association [(56)] *Notes on screeds and under floor insulation, also largely reproduced in* **ESSO PETROLEUM CO LTD Esso guide to house heating. London, 1960, The Company [(56)] *Of limited value but one of the few references on this subject. Also* *BRITISH ELECTRICAL DEVELOPMENT ASSOCIATION Notes on the construction and finish of floors that are electrically warmed. London, 1960, The Association [(23)]
	POINT SOURCES OF HEAT: eg boilers	*Particularly important if close to dpc membrane or tanking*
	COLD STORES AND REFRIGERATION ROOMS	*Specialist advice required*
	FARM BUILDINGS for animal warmth	**SfB (54) Installations, gas, compressed air, steam, refrigeration: General**
	Determine suitable U value for floor in relation to overall U value of building	*FABER, O. and J. R. KELL. Heating and air-conditioning of buildings: chap 2: London, 1958, Architectural Press, 3rd edition [(56)]
12 **Maintenance**	Usually affects finishes rather than structure but is important in factories, where it may affect method of laying screed or granolithic finish Will chemical attack from liquids affect floor construction ?	**SfB (43) Finishes, floor: General** *Factory Building Studies No. 3 Floor finishes for factories. 1959, HMSO [(43)] *BRS Digests (first series): 73 [(43)] 74 Corrosion resistant floors: part II: Materials for finishes [(43)] *Specialist advice may be needed*
13 **Building method**	During building floor may be required to take special loads or wear and tear from cranes, lorries or other plant Requirements may affect: *strength* *method of laying* *time of laying* Protection may be required for slabs laid before structure, including roof, is complete	
14 **Determine cost limitations**	Assess proportion of total net capital cost to be allocated to the ground floor construction	*MINISTRY OF EDUCATION (MOE) Building Bulletin No 4 Cost study. 1957, 2nd edition [Ba7]
15 **Building Regulations**		
TOPSOIL REMOVAL	Determine turf and vegetable matter to be cleared	*MINISTRY OF HOUSING AND LOCAL GOVERNMENT Model byelaws—series IV Buildings. el 16. 1953 edition, HMSO [Aa6]
DAMPNESS	Site drainage Level of floor Impervious material or dpc	*Model byelaws 15 to 18 and 52 [Aa6] *LONDON COUNTY COUNCIL London building (constructional) by-laws 4.03. 1952 [Aa6] *DEPARTMENT OF HEALTH FOR SCOTLAND Model building byelaws 90, 91 and 160: Burghs 1954, reprinted 1957. HMSO [Aa6] *DEPARTMENT OF HEALTH FOR SCOTLAND Model building byelaws 91, 92 and 174: Counties 1954, reprinted 1957. HMSO [Aa6]
SITE CONCRETE	Thickness Quality	*Model byelaw 17 [Aa6] *London building (constructional) by-laws 3.07, 4.03 [Aa6] *Model building byelaws (Scotland): Burghs, 90, 91, 160; Counties 91, 92, 174 [Aa6]
LOADING	Requirements not well covered in regulations	*London building (constructional) by-law 2.02 [Aa6] *applies but district surveyor " to be satisfied." Table 1 gives loads but does not cover heavy factory or warehouse*
VENTILATION	Below timber floors LCC and Model byelaws differ	*Model byelaws 52 [Aa6] *London building (constructional) by-laws 4.04 [Aa6]

THERMAL INSULATION	For houses the regulations require U value of 0.25 or better	*Model building byelaws (Scotland): Burghs 160; Counties 174 [Aa6] MOHLG Circular No 63/59, Revision to Model byelaw 78 (7) [Aa6]. *Table C gives acceptable constructions*

Basic design

16 **Consider purpose**	HARD SURFACE to: receive floor finish (or be a suitable finish) drain liquid withstand loading: *self-weight* *superimposed static loads* *moving loads* *impact loads* distribute loads to subsoil protect services within or beneath floor BARRIER to: vegetation vermin rising damp vapour liquids on floor surface heat transmission	
17 **Determine floor level**	Consider: SITE LEVELS LEVELS OF ADJACENT ROADS AND BUILDINGS DRAINAGE COST OF EXCAVATION AVAILABILITY OF HARDCORE CHANGES IN LEVEL DPC LEVEL, arrangement in walls must be related to internal floor and external ground or paving levels	*Savings in hardcore may be achieved by stepping the floor or possibly by using a slightly sloping floor to follow ground levels in a large building eg warehouse*
18 **Thickness of finish to slab**	TYPE OF FINISH PROPOSED: affects level of construction floor changes in finish affecting slab POSITION OF DPC use of screed as loading POSITION OF INSULATION SERVICE REQUIREMENTS: floor drainage and falls channel drains heating conduits and wireways METHOD OF LAYING AND FUTURE MAINTENANCE	**SfB (43) Finishes, floor: General**
19 **Choose solid or suspended construction**	Usually determined by floor level but may be influenced by cost or particular requirements such as loading or floor finish which may make a solid floor essential Consider: levels loads finish insulation services SOLID CONCRETE FLOOR with: cement composition finishes *eg granolithic and terrazzo* timber floor in contact with site concrete finishes other than timber or cement *eg pvc tile, cork, linoleum, rubber* SUSPENDED TIMBER FLOORS SUSPENDED CONCRETE FLOOR	*Solid floors impose fewer restrictions on selection of floor finish and are more suitable for heavy loadings; suspended floors may prove to be more economical on sloping sites although needing insulation to bring them below limit imposed by regulations* para 28–40 below para 41–47 below para 48–51 below para 52–61 below **SfB (23) Floors, structural: General**
20 **Check cost**	Check requirements against proportion of total net cost allocated to element if necessary: modify proposed construction reconsider cost allocation	*In consultation with quantity surveyor*

FLOOR DUCTS

21 **Determine purpose, size and position**	PURPOSE: heating, water supply, electrical, etc, special requirements	see appropriate EDGS for Installations, particularly **SfB (54) Gas, compressed air, steam, refrigeration: General**
	SIZE: depth, width, levels check adequacy at : *junctions* *expansion joints* *where valves occur* adequate for: *installation* *maintenance*	*BS CP 413 (1951) [(5)]
	POSITION: service requirements future accessibility use of floor space floor pattern	
22 **Drainage**	Consider: falls to drainage outlets check drain depth adequate for connections for inadequate drain depth consider: antiflooding gullies sump pumping rodent protection	*If connected to drain, check position of trap to ensure that it does not dry out*
23 **Ventilation**	Consider: condensation heat losses safety; refrigerants, gas leakage, etc	*Danger of explosion or to health of maintenance staff* *BS CP 413 (1951) p 312 [(5)] *for fire risk*
24 **Waterproofing**	No clear guide can be given; depends on site conditions and depth of duct and purpose of duct Consult service specialists Check for: special jointing at daywork joints and junctions continuity of dpc membrane at junctions with floors and walls	
25 **Construction**	BRICK: rendered fair face CONCRETE: reinforced concrete mass precast sections blocks	*Check integration with floor construction and continuity of reinforcement*
26 **Built-in hangers for services**	POSITION FLEXIBILITY SPEED OF INSTALLATION STRENGTH DURABILITY MATERIAL SPECIAL REQUIREMENTS (eg roller guides)	*Check requirements with engineering adviser* **SfB (52) Installations, drainage and sanitation: General** **SfB (53) Installations, water, hot and cold: General** **SfB (54) Installations, gas, compressed air, steam, refrigeration: General** **SfB (56) Installations, heating: Equipment and fuel** **SfB (57) Installations, ventilation, air-conditioning: General** **SfB (63) Installations, electrical: Lighting and power: General**
27 **Covers**	ACCESSIBILITY: Totally removable Partially removable SIZE: length and position of access covers suitable for placing and replacing of pipes etc POSITION: check positions of access covers related to machinery and equipment SEALING: consider sealing of covers to prevent entry of floor liquids MATERIALS AND DESIGN: types, self-finish, or tray to receive finish strength requirements for traffic frequency of removal	

	SERVICE REQUIREMENTS: in addition to ducts, locate and specify holes for service risers or drain or other outlets	

Detail design

SOLID CONCRETE FLOOR **cement composition finishes** eg granolithic and terrazzo	It is difficult to find useful references on this section, especially for proper design and construction of the concrete slab together with hardcore or other material below. There is, however, a considerable amount of information about design of concrete roads for light and heavy traffic and much of this may be applicable to floors taking heavy loads or traffic	*PRINCIPLES OF MODERN BUILDING: vol 2, chap 3 [Bb] **CEMENT AND CONCRETE ASSOCIATION (CCA) Guide to concrete road construction: Questions and answers. Department of Scientific and Industrial Research and CCA publication, London, 1958, The Association, 2nd edition [(14)] *also* **SfB (14) Roads, paths and pavings: General** *There are good references on concrete finishes. Most useful will probably be:* *CCA Concrete floor finishes, 1957 [Tq4] *CCA Specification for granolithic floor toppings laid on in-situ concrete. London, 1960, The Association [Tq4] *BS CP 204 (1951) In-situ flooring [T] *Of value for some finishes but does not cover recent types. Of some general interest also is* **COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ASSOCIATION (MELBOURNE) Report No R7 Industrial concrete floors for factories. 1961, revised edition [Tq4]
28 **Excavation**	Determine amount of topsoil to be removed For heavily loaded floors or large areas or on bad ground remove all topsoil For small buildings some latitude for economy: *at least 6 to 9 inches normally removed*	See Regulations para 15 above
29 **Hardcore**	Determine type, amount and consolidated thickness of hardcore May be necessary to bring up to required levels Determine hand packing or rolling Specify blinding or covering with building paper as base for concrete Possible alternative to hardcore is compaction of earth by vibrating roller	*Suitability of soil for compaction should be carefully checked*
30 **Slab mix and reinforcement**	Decide: TYPE OF CEMENT QUALITY OF AGGREGATE PROPORTION OF MIX ADDITIVES WATER CONTENT Consider: PLACING COMPACTION VIBRATION FINISH IF NOT SCREEDED Good quality concrete usually better than thicker poor concrete LIGHT LOADS: except for small and lightly loaded floors some reinforcement may be required HEAVY LOADS: there does not appear to be a good reference and engineering advice may be necessary BASEMENT FLOOR SLABS: generally similar but may require loading layer on top of dpc. In the case of waterproof concrete construction water bars will be necessary in construction joints	*BRS Digests 13 and 14 (second series) Concrete mix proportioning and control—1 and 2 [E] *Manufacturers' recommendations* *A 6-in floor with mesh reinforcement at 5 lb to 7 lb per sq yd adequate except for very heavy loads. Reinforcement usually placed 2 in below surface* **SfB (13) Retaining structures** EDG para 20. *The reinforcement will often be designed in continuity with that in retaining walls and may be required to withstand upward pressure*
31 **Determine bay size of slab**	Recommendations vary from 150 sq ft up to about 300 sq ft. Small size for unreinforced or thin slab Square bays preferable, but keep within limiting ratio or sides $1\frac{1}{2}$: 1	General publications as para 28 above

	Screed bay joints should coincide with slab bay joints Consider standard sizes of fabric reinforcement to avoid waste in large floors	*Maximum bay sizes for screed govern choice of slab bay size*
32 **Slab joints**	Determine type of joint: butt joints, normal t and g sometimes preferred for thick slabs dowel bars Determine whether joint is to be provided around edges of slabs where against walls or columns Reinforcement crossing joints (as in roads) sometimes provided for heavy traffic to prevent damage at edges	General references as para 28 above AJ Information Sheet 1013, Road construction: Movement joints [**(14)**] **SfB (14) Roads and pavings: General** EDG para 23 *With heavy traffic, variations in height of slab at joints cause breakage*
33 **Holes and openings**	Settle size and positions of openings: machinery bases drainage service entry columns and walls penetrating slab	
34 **Underfloor insulation**	Decide: POSITION THICKNESS MATERIAL WATERPROOFING Check U value of whole floor Achieve this U value by: decreasing perimeter length in relation to area use of structural discontinuity at perimeter and incorporation of edge insulation in low density sheet material addition of thermal insulation layer over whole floor area by: *use of lower density materials* *under screed insulation layer* *insulation incorporated in floor finish*	*Principles of modern building: vol 2 p 60 and 78 [Bb] **Panel heating [(56)] *also largely reproduced in* **Esso guide to house heating [(56)] AJ Information Sheet No 1046 [**(23)**] **INSTITUTE OF HEATING AND VENTILATING ENGINEERS Guide to current practice: p 58–59 London 1959. The Institute, 2nd edition [Ab8] *gives heat transmission coefficients for floors*
35 **Dpc membrane**	NECESSITY: by-law requirements floor finish deterioration of building contents protection of insulation rot prevention efflorescence discomfort to men, animals liquids to be contained by floor MATERIAL AND TYPE: asphalt hot bitumen hot pitch cold bitumen bitumen/rubber felt plastic POSITION: to link with adjacent dpcs in walls loaded to resist water pressure protected during construction	*BRS Digest 86 (first series) Damp-proof treatment for solid floors [(23)L] See Regulations para 15 above *Check that location of damp-proof membrane will provide protection to any thermal insulation layer and that it will not be damaged by heat. Where insulating layers of material that can be damaged by water are laid below concrete or screeds, then these must be protected by damp-proof membrane also* AJ Information Sheet No 1045 [**(23)**] *BS 743:1951 Materials for damp-proof courses [L] *BS 1097:1958 Mastic asphalt for tanking and damp-proof courses (limestone aggregate) [Ls4] *BS 1418:1958 Mastic asphalt for tanking and damp-proof courses (natural rock asphalt aggregate) [Ls4] *BS 1310:1950 Coal tar pitches for building purposes [Ds1] *Hot and cold bitumen* *BS 743:1951 [L] Manufacturers' catalogues *Principles of modern building: vol 2 p 59 [Bb]

36 **Method of laying**	Whether screed is to be bonded by laying on " green " base concrete or to be laid subsequently affects thickness of screed	General publications at head of this section
	Use of dpc below screed breaks the bond and therefore requires thick screed	*BRS Factory Building Studies No 3 [(43)]
	Laying on hardened or dirty concrete needs proper preparation	
37 **Thickness of screed**	Probably ¾ in or less when bonded to " green " concrete, as greater thickness gives trouble	General references as para 28 above
	On screeds separated by dpc or paper or sand, at least 2 in thick	
	On cleaned old concrete, grout or use proprietary bonding agent before screeding and use not less than 1¼-in thickness	
	Thickness may need increasing to take services	
	On falls required for floor drainage:	*BRS Digests (first series) 73, 74 [(43)]
	determine whether in base floor or screed	*Specialist advice may also be needed*
	allow adequate thickness, including for gutters in the screed if required	
	leave openings for sumps	
	Will it be necessary to replace the floor screed in future maintenance?	
	Thin bonded screeds can give difficulty	
38 **Bay sizes of screed**	Depends upon method of laying: 150 sq ft to 250 sq ft is usual	General references as para 28 above
39 **Determine screed mix**	Proportions and contents of mix	*CCA Concrete floor finishes [Tq4]
	Floor hardeners or other additives:	*Manufacturer's advice should be obtained*
	integral liquid hardeners	
	abrasive powder hardeners worked into surface	
	integral curing compounds	
	Special protection required because of trade wastes	*BRS Digests (first series) 73, 74 [(43)]
	corrosion of reinforcement	
	deterioration of cement	
40 **Finish to screed**	Degree of finish depends upon type of floor finish to follow	**SfB (43) Finishes, floor: General**
	Thin floor finishes usually require smooth screeds	See BS CP204 (1951) [T] for appropriate type of floor finish, or obtain specialist flooring contractor's requirements
	Type: *wood float*	
	steel trowel	
	power float	
SOLID CONCRETE FLOOR timber finish in contact with site concrete		*The most useful general references for these floors are:*
		*BS CP 201 (1951) Timber flooring [Ti]
		*BRS Digest 18 (second series): The design of timber floors to prevent dry rot [(23)]
		*TIMBER DEVELOPMENT ASSOCIATION (TDA) Red Booklet. Wood flooring. London, undated, The Association [Ti]
41 **Excavation**	Determine amount of soil to remove	
	By-laws suggest remove all, but practice varies	*Model byelaw 16 [Aa6]
	On poor or variable ground or beneath heavily loaded floors remove all, otherwise 6 in to 9 in is often acceptable	*London building (constructional) by-laws 4.03 [Aa6]
42 **Hardcore**	Determine type and amount of hardcore, if any	*London building (constructional) by-laws 4.03 [Aa6]
	Refer to by-laws for normal cases	*Model building byelaws (Scotland): Burghs 90, 91, 160; Counties 91, 92, 174 [Aa6]
	Difficult conditions, such as very poor ground, may require special measures	
43 **Site concrete**	Determine mix and thickness	See para 30 above
	Refer to by-laws for normal cases	*Model byelaw 17 [Aa6]
		*London building (constructional) by-laws 4.03 [Aa6]
		*Model building byelaws (Scotland): Burghs 160; Counties 174 [Aa6]
	Consider whether particular conditions, such as very poor ground, require special measures	

44 **Type and position of membrane dpc**	REGULATIONS	*Model byelaw 52 [Aa3] *London building (constructional) by-laws 4.03 [Aa6] *Model building byelaws (Scotland): Burghs 90, 91, 160; Counties 91, 92, 174 [Aa6]
	CONDITION OF SITE AND WATER LEVEL: generally with timber floors in contact with site concrete a membrane dpc is needed, but on a dry site this dpc is occasionally omitted when wood block is laid on hot bitumen	*BRS Digest 18 (second series) [(23)] *BRS Digest 86 (first series) Damp-proof treatment for solid floors [(23)L] AJ Information Sheet No 1045 [**(23)**]
	WATER PRESSURE: even very slight, requires loading on top of membrane dpc	
	CONTINUITY: check proper junction of membrane dpc with wall dpcs	
	DETERMINE TYPE OF DPC	*BRS Digest 86 (first series) [(23)L]
	hot bitumen hot pitch cold bitumen coal tar/rubber bitumen/rubber	*BS 1310: 1950 [Ds1]
	asphalt	*BS 743:1951 [L] *BS 1097:1958 [Ls4] *BS 1418:1958 [Ls4]
	felt	*BS 743:1951 [L]
	plastic sheeting	Manufacturers' catalogues
45 **Method of fixing finish**	Adhesives	**SfB (43) Finishes, floor: General**
	Pins, to nailable lightweight screed	*BS CP 201 (1951) [Ti]
	Dowels	*TDA Red Booklet: Wood flooring [Ti]
	Fixing battens: *size* *type* *spacing* *fixing by clips* *held by screed* *preservative treatment*	*Where battens are in the screed London building (constructional) byelaws require pressure creosoting*
46 **Screed**	Determine type and thickness of screed and type of finish	*BS CP 201 (1951) cl 1·312 [Ti] (lightweight screed)
	Lightweight nailable or normal dense	
	Expansion joints if required	
	Wood float finish for block floors	*Thickness probably* 1in *minimum; more to suit batten thickness*
47 **Timber finish**	Type of timber	**SfB (43) Finishes, floor: General**
	seasoning (moisture content)	*BS CP 201 (1951) [Ti]
	thickness	*TDA Red Booklet: Wood flooring [Ti]
	Pattern (for blocks and plywood)	*BS 1187:1959 Wood blocks for floors [Ti]
	Joints (for boards)	
	Adhesives (for blocks)	*BS 1297:1952 Grading and sizing of softwood flooring [Ti]
	Nailing (for boards and plywood)	
SOLID CONCRETE FLOOR **other finishes** eg pvc, cork, linoleum, rubber		**SfB (43) Finishes, floor: General**
48 **Excavation and base floor**	Generally as for timber floors in contact with site concrete	see para 29–30 above
49 **Dpc**	Determine whether dpc membrane is necessary	See also para 35–44 above for considerations
	Use of building and type of contents	See also para 15 for Regulations AJ Information Sheet No 1045 [**(23)**]
	Certain types of finish always require a dpc if satisfactory adhesion is to be obtained; others may be all right without, if site is reasonably dry	*BRS Digest 86 (first series) [(23)L] gives advice on need for dpc with various types of floor finish
	Obtain specialist flooring suppliers' advice	*Note: In some storage rooms the nature of the goods stored may be an influencing factor*
50 **Insulation**	Check effect of location of insulating layer on thermal comfort conditions; the discomfort of cold feet occurs where thin floor finishes are used on thick concrete. The nearer the layer to the surface, the greater the comfort	AJ Information Sheet No 1046 [**(23)**]

51 **Type of finish to screed**	Thin sheet or tile materials require level and smooth screeds Obtain specialist suppliers' requirements: *cement and sand screed* *proprietory screeds* Use of asphalt as dpc and subfloor	*Flooring specialists' requirements* **SfB (43) Finishes, floor: General**
SUSPENDED TIMBER FLOORS		*The most useful general references on this type of floor are:* *BS CP 201 (1951) [Ti] *TDA Red Booklet: Wood flooring [Ti] *Principles of modern building: vol 2 p 53–56 [Bb]
52 **Determine amount of soil to remove**	By-laws suggest remove all, but practice varies; 6 in to 9 in is often acceptable	See para 15 above for building regulations
53 **Site concrete**	Determine amount and type of hardcore, if any Determine thickness and mix of site concrete	See para 15 for regulations
54 **Underfloor ventilation**	Height from site concrete to underside of floor Ensure through ventilation Solid floors may raise difficulties Wall vents: of 1½ sq in per 1 ft run of external wall	See para 15 for regulations: generally 6 in seems adequate *BS CP 201 (1951) p 14 [Ti]
55 **Sleeper walls**	Material: *brick* *concrete block* *metal straps* Solid or honeycomb Continuous or piers Height Thickness Foundation	*TDA Leaflet: Construction in timber for housing: Joist floor supported from ground seal slab [(23)]
56 **Dpc**	TYPE: slate or bitumen felt types most usual, but asphalt, lead and copper or impervious brick sometimes used POSITION: immediately below timber wall plates and joists linked to main dpc or with air space check possible by-pass of dpc at junctions with solid floors or at changes in floor levels	*BS 743:1951 [L] *BS 1178:1944 Milled lead sheet and strip for building purposes [Md8] *BS 1097:1958 [Ls4] *BS 1418:1958 [Ls4] *BS 1569:1949 [Md5]
57 **Joists**	Determine joist spans, quality, sizes and spacing and fixing Height of sleeper walls may affect cost for different spans	*Model byelaws: 5th schedule [Aa6] *BS 1860: Part 1: 1959 Structural timber. Measurement of characteristics affecting strength. Softwood [Hi2] *London building (constructional) by-laws 8·01 (joist sizes) [Aa6] *Model building byelaws (Scotland): Burghs 160 table 26; Counties 174 table 25 [Aa6]
58 **Wall plates and fixing**	Type timber, mild steel } bedding engineering bricks none Fixing of joists to wall plates: stitch nailed hoop iron	*TDA Red Booklet: Wood flooring: p 30 [Ti]
59 **Flooring**	Determine: THICKNESS, normally by span between joists QUALITY AND SPECIES JOINTING: square-edged, or tongued and grooved WIDTH TYPE OF NAILING: cut clasp, secret, oval wire etc	*London building (constructional) by-laws 8·02 [Aa6] *Model building byelaws (Scotland): Burghs table 27: Counties table 26 [Aa6] *BS CP 201 (1951) cl 2·2 [Ti] *BS 1297: 1952 ([Ti] *TDA Red Booklet: Wood flooring [Ti] *BS 1202:1944 Wire nails and cut nails for building purposes [(20)]
60 **Insulation**	Determine need for insulation, its type and thickness Regulations demand U value of 0·25 for floor Aluminium foil or blanket types such as glass fibre or slag wool most usual Check U value of construction	*BS CP 201 (1951) cl 1·305 [Ti] Principles of modern building: vol II p 52–53 [Bb] *TDA Red Booklet: Wood flooring: p 12 and 13 [Ti]

61 **Preservation**	Determine if timber to be treated in part or whole by pressure or brush treatment: *in-situ* *on site* *by merchant*	*BS CP 201 (1951) cl 1·308 (Ti) *TDA/BRITISH WOOD PRESERVATION ASSOCIATION Timber preservation. London, undated, The Associations *BS 913:1954 Pressure creosoting of timber [Du3] *BS 1282:1959 Classification of wood preservatives and their methods of application [Du3] *BS 3051:1958 Coal tar oil types of wood preservatives [Du3]
	Determine moisture content of timber to guard against decay and to avoid excessive shrinkage	*TDA Red Booklet: Wood flooring: p 3 [Ti]
	Consider effect of site storage	*BRS Digest 18 (first series) [(23)] *BS CP 201 (1951) cl 1·306 [Ti]

Specification

62 **Site slabs**	Excavation Removal of topsoil subsoil Backfill and consolidation Type of hardcore Consolidation of hardcore Blinding Base concrete: *thickness* *aggregate and mix*	*BS 822, 1201:1954 Concrete aggregate from natural sources [Dp] *BS 1199:1955 Building sands from natural sources [Dp]
	bay sizes *joints* *waterproofing* *reinforcement* *method of laying (alternate bays)* *slope to falls* *curing and protection*	
63 **Dpc**	Type Position Protection during construction Specialist subcontractors and prime cost sums	
64 **Insulation**	Type and thickness Position Specialist or nominated subcontractor or supplier	
65 **Screeds**	Thickness Aggregate and mix Bay sizes Joint treatment Waterproofing and curing aids Reinforcement Method of laying	*Consider effect of laying when exposed to weather: the use of dry mixes and a power float may be advisable*
	Cover to services Slope to falls, gutters Type of finish Use of hardeners Curing and protection Surface-applied hardeners	
66 **Granolithic and terrazzo**	Best done by specialist firms—certainly for terrazzo and for large areas of granolithic Main points are as for screeds above Terrazzo bays should be kept much smaller	**SfB (43) Finishes, floor: General** *BS CP 204 (1951) [T] *CCA Specification for granolithic floor toppings laid on in-situ concrete [Tq4] *A very full and useful document*
67 **Suspended timber floors**	Sleeper walls Dpcs Quality of timber, including moisture content Method of storage Preservation treatment	

	Wall plates—size and fixing Size and spacing of joists and fixing Ventilators Insulation materials and fixing Boarding—type, fixing and finish Protection and leave clean	

Contract

68 **Precontract stage**	Obtain tenders for specialist work	*MACFARLANE, A. A. Site supervision: chap 3 and 4. London 1956, Architectural Press [Bb2]
	Approve samples	*Consider samples, also other services offered by subcontractor eg polishing*
	Consider access for erection cranes or other plant Agree programme noting effect on laying screed when base is "green"	*Programme. Formation of ducts may have considerable influence on programme for whole floor. Where removable duct covers are not continuous, the programme for service installations may govern completion of flooring*
	Advantages of laying ground floors when protected by floors or roof over	
69 **Supervision**	Site storage Check: *levels* *soil removal* *site concrete* *timber quality and preservation treatment* *dpcs* *ventilation* *joist spacing and sizes and levels* *preservative treatment* *insulation* *nailing* *board finish* *cleaning off, including rubbish below floor*	*MACFARLANE [Bb2]
70 **Client**	Warn to keep air vents clear in suspended floors Advise on polishes and cleaning if relevant Treatment of finish needs specialist advice both for first treatment and for subsequent maintenance. Specialist firms will always supply information	Manufacturer's data *BS CP 204 (1951) [T] *of value for some finishes but does not cover recent types*

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AJ SfB (23)

Technical Study UDC 69 025
Floors, ground: General

Floors on the ground

The subject of floors on the ground is poorly covered in the common reference books. In this Technical Study Cecil Handisyde questions some of the accepted practices and points out gaps in present knowledge

When nearly every building has a floor on the ground, it is surprising that there seems to be no publication which covers this subject in a comprehensive way. Most " designs " for solid floors are based on tradition, and sometimes in a rather unquestioning way. The exception is when really heavy loading is expected and an engineer is consulted. Even then, the subject seems to be tackled somewhat empirically unless the loads are sufficiently heavy to raise doubts about the overall bearing capacity of the soil. In such cases the floor will probably be designed in conjunction with foundations and become, in effect, a suspended floor even though cast upon the ground. The reason for the general lack of a satisfactory design method is perhaps that the design of anything resting on soil is a very difficult matter. The soil does not give uniform support and the loading is not uniformly distributed. Most work on this subject concerns the design of roads and airport runways and is not directly applicable to ground floors in buildings. The expense of carrying out necessary tests in every case would be greater than the cost of putting in a little extra concrete or steel. Some of the points on which more information is needed are: the value of removing all the topsoil, the value of hardcore, the thickness of concrete and need for its reinforcement, and the size of concrete bays in large floors. An engineer would probably advise the removal of all topsoil. In many small buildings, at least, only a limited amount is removed—6in to 9in is a fairly common specification and appears to give generally satisfactory results. One wonders if total removal of topsoil in small buildings is really a hang-over from the time of suspended timber floors in buildings without site concrete. In these days of earth-moving machines, the cost of removing rather more soil is not serious and, in some cases, the topsoil may be required elsewhere on the site or be worth its cost of removal. The snag is the expense of filling again with hardcore. One is tempted to think that where small, lightly-loaded floors are concerned, total removal of more than a few inches of topsoil is unnecessary if it is in an undisturbed state. For large floors, the situation is rather different as troublesome soft spots could be present. With fairly heavily-loaded floors, complete removal of topsoil is advisable to avoid subsidence. One argument in favour of removing a fair amount of topsoil is that the surface then becomes more suitable for the movement of lorries and equipment during building.

What is the point of hardcore? Some books claim it " keeps ground moisture away from the floor." It may have some slight value in this respect but it is very doubtful that one should rely on it to ensure a dry floor. If a floor finish needs to be free from rising damp, a damp-proof membrane is the only safe answer. On a fairly dry site, good hardcore might just tip the balance in favour of omitting the dpc, in a doubtful case. Again, hardcore is sometimes claimed to improve the thermal insulation, but there seem to be no data on this point. Generally, a reasonably clean site is needed on which to place the concrete, and this can be

obtained by putting down a thin blinding coat or by placing building paper or a polythene covering before pouring. Some such protection ensures that the full thickness of structural or site concrete is kept free from dirt and also that reinforcement can be better placed and kept clean. The principal purpose of hardcore seems to be to fill the space left by the removal of topsoil. Would a good dose of weedkiller and a compaction roller obviate digging out and filling up? Some consider that it might, while others argue that the roller could set up a ground wave which would travel ahead of it. If hardcore is put down at an early stage, the average building process will, almost automatically, consolidate it. Another advantage is that it helps to provide a reasonable working surface during construction. One wonders, however, if it is *always* worth while for small jobs built in good weather or on very good ground.

The inclusion or omission of reinforced concrete also appears somewhat haphazard. Some people claim its value is in bridging soft spots; others that it prevents, or at least reduces, shrinkage cracks, and a proportion that it is needed to prevent curling or damage under heavy wear on junctions between bays, especially at corners. Except for very heavily loaded floors, where expert advice should be taken, it appears that for large floor areas light reinforcement of 4lb to 7lb a sq yd, placed 2in down in the slab, is generally accepted. On lightly loaded floors in buildings with small rooms, the omission of reinforcement seems to be normal practice. Industrial floors are tending to receive heavier loads than in the past, especially heavy moving loads from trucks etc, and more care should be taken in designing floor slabs and their junctions in such buildings. It is worth noting that quite heavily loaded airport runways are laid without reinforcement and that the cost of quite light reinforcement is equal to a considerable increase in thickness of concrete.

It is many years since the publication of *Post-war building studies No* 15, *Walls, floors and roofs*. This said, "There is a need for practical rules enabling principles of soil mechanics to be taken into account, especially in the case of made-up ground." We seem to have made little general progress in this direction! Two developments of interest, however, are worth noting. First is the system of construction evolved by the Nottinghamshire County Council for schools to be built in areas liable to mining subsidence. Although developed for this particular purpose it appears that the system has proved very economical in all conditions. As designed, it is for lightly loaded buildings of up to three storeys and depends for its success on the combination of a special type of structural frame carried on a ground slab which is designed to "slide" on a bed of sand. It is essential to this scheme that there should be no downward projections beneath the slab which, for the type of buildings required, is of only 5in thickness. A detailed description of the design was given in the AJ 10.10.57. The second point of interest is the extension of the use of soil stabilisation methods from roads to buildings. It is believed that the War Office is investigating the possibilities of this but at present there appears to be no published information.

There is usually little difficulty about the design of suspended wood floors, with the possible exception of determining what is adequate ventilation. There are rules about this in the building regulations and recommendations in BRS Digest No 1. With solid floor finishes to floors on the ground, all the usual questions of suitability arise, but for the most part these are common to the choice of floor finishes in general. Two special questions do arise in the case of ground floors: whether or not a membrane dpc is necessary, and, in the case of cement type finishes, if it is to be laid while the concrete is green or subsequently and what effect this has on the design. The need for a damp-proof membrane is dealt with fairly well in BRS *Digest No* 86, but the arguments on laying cement mix toppings "green" or later are not conclusive.

It seems that the best bond is obtained when a granolithic or similar finish is laid immediately after the sub-floor has been placed. But this has two main disadvantages. One is possible damage during the further building processes and this must depend to a large extent, on how late in the job it would be possible to lay the floor. Early laying of a concrete base may be of considerable advantage in improving access, and perhaps in providing a good base for a crane in structural frame erection. A second possible disadvantage is that, as all authorities are agreed, the topping coat should be not more than $\frac{3}{4}$in thick. This may cause considerable difficulty if repairs have to be done, as the first $\frac{3}{4}$in topping will be so well bonded that it will be difficult to remove. Also, a $\frac{3}{4}$in depth is insufficient to obtain a satisfactory new finish on old concrete, so that either some of the thickness of the main sub-floor will have to be broken up or the floor level will have to be raised to provide the $1\frac{1}{2}$ in to 2in thickness required for a new finish. It seems that, for this reason alone, the use of the $\frac{3}{4}$in "green" technique may not be a good thing in buildings where either heavy wheeled traffic or corrosive processes are likely to damage the surface, or where much cutting and making good is likely to be needed for alteration to plant or services. A useful discussion on the value of laying the floor in this manner is contained in *Factory Building Studies No* 3 (HMSO) where the conclusion tends to favour the method in spite of its disadvantages. There seems to be an increasing appreciation of the benefits of "laying green" and good results are obtained with thicknesses of $\frac{3}{8}$in, or even as little as $\frac{1}{4}$in, or dry mix machine laid or power floated into position.

A minor problem which causes some difficulty to designers is the degree of slope to be provided where floor drainage is needed. But the experts appear to be fairly well agreed. For smooth surface finishes a minimum slope of 1 in 80 is recommended with 1 in 60 being preferable. If the surface is rough or if there is a great deal of spillage, a slope of 1 in 40 may be necessary. This is about the maximum which can be accepted without inconvenience, and even a slope as steep as this should be arranged, as far as possible, to be across the line of traffic. Whenever it can, floor drainage should be reduced to a minimum by catching effluents at their source, or, where this is not possible, by arranging floor gutters to catch the liquids at the earliest possible position. It is also important to ensure that machine bases are not likely to obstruct runs of liquid to the nearest gutter or drain point.

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AJ SfB (23)

Information Sheet No 1046 UDC 69·025: 699·82
Floors, ground: General

SOLID FLOORS ON THE GROUND: DAMP-PROOF MEMBRANES 26.A6

This Sheet describes the purpose and requirements of a damp-proof membrane and the range of materials which may be used.

General

Unless the nature of the floor finish is such that it does not require it, a concrete floor on the ground should be provided with a damp-proof membrane to prevent the passage of water from the ground, whether in liquid or vapour form. Broadly speaking only two kinds of floor finish do not require such protection, (a) those which have the ability to transfer moisture harmlessly to the air above as fast as it accumulates below and (b) those which are, in effect, combined finishes and damp-proof membranes. Type (a) finishes include granolithic screeds and concrete or clay tiles. Type (b) include pitch mastic and mastic asphalt flooring.

Building regulations

Clause 51 (1) of the Model By-laws—Series IV—sets down the requirement that the lower or lowest floor of a building *shall adequately resist the passage of moisture from the ground*, unless the nature of the ground renders this unnecessary. Clause (2) (a) states that for a solid floor on the ground the above requirement will be satisfied if the floor itself, or its finish, is impervious to moisture or if a damp-proof layer is inserted within the thickness of the floor. Similar requirements are set down in the Model By-laws for Counties (Department of Health for Scotland) in clauses 91, 92 and 174 and the Model By-laws for Burghs in clauses 91 and 160.

Position of membrane

A damp-proof membrane may be placed either beneath the floor slab (ie directly on top of the blinded hardcore), within the thickness of the slab or on top of it. A number of factors will influence its position. If placed beneath or within the concrete floor, time must be allowed for the concrete to dry out before any moisture-sensitive finish is laid. The decision may, however, ultimately depend upon the material used for the membrane. All damp-proof membranes must be continuous with the damp-proof courses in the surrounding walls.

Materials for damp-proof membrane

BRS Digest No 86 distinguishes between those damp-proof membranes which are applied hot and those which are applied cold. Into the first category it places mastic asphalt and pitch mastic flooring or mastic asphalt to BS 743:1951, *Materials for damp-proof courses*, and hot-applied pitch to BS 1310:1950, *Cold tar pitches for building purposes*. The second category includes bonded bitumen felt to BS 743:1951, cold pitch or bitumen solutions in sandwich layers, cold tar/rubber and bitumen/rubber emulsions, cold bitumen/water emulsions in sandwich layers, building papers in sandwich layers and integral concrete waterproofers. To this group may be added polythene film, a material which, in recent years, has been used increasingly for this purpose.

Mastic asphalt: For practical purposes this material is absolutely impervious. It is prepared from mixtures of bituminous binders and inert aggregate. It is generally black, but a range of colours is available. When used merely as the damp-proof membrane, it should be applied in two coats to a total thickness of not less than ¾in. When used as the floor finish as well, thickness will depend upon the function of the building. A heavy duty industrial floor, such as a loading bay, may require a thickness up to 2in. Other heavy industrial floors should be at least 1in thick. Medium duty floors, such as stores, should be ¾in thick and light duty, such as offices, ⅝in. The Natural Asphalte Mine-Owners and Manufacturers Council, 14 Howick Place, London SW1, will supply technical information on the properties of mastic asphalt, together with recommendations on construction details, laying techniques and the wording of specifications. It will also supply architects with the names and addresses of manufacturers and contractors throughout the country.

Pitch mastic: This material may be used not only as the damp-proof membrane but also as a floor finish and, for practical purposes, it can be regarded as absolutely impervious. BS 1375:1947, *Coloured pitch mastic flooring* and BS 1450:1948, *Black pitch mastic flooring* recommend the following thicknesses: light traffic, such as office and domestic floors and light stores, ⅝in or ¾in; heavy traffic, such as heavy factories, loading docks, garages, 1in and over.

Hot-applied pitch or bitumen: These materials should be used as a sandwich layer to a minimum thickness of ⅛in, when, for all practical purposes, they are impervious.

Bitumen felt: Felts which conform with BS 743:1951, *Materials for damp-proof courses*, may be used as a sandwich layer. They are usually supplied in 3ft wide rolls and should be bonded to provide an impervious barrier. The Association of British Roofing Felt Manufacturers Ltd, 69 Cannon St, London EC4, will supply names and addresses of manufacturers.

Cold pitch, bitumen solutions and emulsions: There are a number of proprietary products on the market which come into this category. Most of them are applied cold, in two coats by brushing or mopping or by use of a squeegee. They are intended to be used as a sandwich layer and can either be inserted between thicknesses of the floor itself, or on top of the floor, in which case a screed, usually 2in thick, should be applied over them to take the floor finish. These types of membrane include the following.

Evoseal 201 *Cold Bitumen Covering* is a cold-applied membrane. It should be applied in two coats at the rate of 14 sq yd per gallon each coat. It may be applied even to green concrete. Cost: 35 gal drum 4s 6d per gal, 10 gal drum 5s per gal, 5 gal drum 5s 9d per gal.

Evoseal 202 *Bitumen/Rubber Latex* has the same characteristics as Evoseal 201 but contains a high proportion of rubber latex giving increased flexibility and resistance to water vapour. It should be applied in two coats, each of which should cover 10 sq yd per gal. Cost: 35 gal drum 11s per gal, 10 gal drum 12s per gal, 5 gal drum 12s 6d per gal.

Evoseal 505 "*S*" *Pure Bituminous Solution* is a heavy-bodied bituminous solution and is recommended by the manufacturer to be used as a final coat to either of the above when the nature of the floor finish requires an exceptional resistance to the passage of moisture vapour. Where underfloor heating is used it is essential to use Evoseal 202 finished with a final coat of Evoseal 505 "S." Cost: 40 gal drum 6s 3d per gal, 10 gal drum 8s per gal, 5 gal drum 8s per gal.
(Evode Ltd, Common Road, Stafford.)

Flintkote Type 1 *Emulsion* is a bitumen emulsion. It is applied in two coats at right angles to one another, at the rate of 8 sq yd per gal for each coat. Cost: 40 gal drum 6s 6d gal, 10 gal drum 7s 6d gal, 5 gal drum 8s gal.

Flintkote DPC Coating is a rubber bitumen emulsion. It is applied in two coats, each at 12 sq yd per gal.

SOLID FLOORS ON THE GROUND: DAMP-PROOF MEMBRANES

Cost: 40 gal drum 8s 6d gal, 10 gal drum 9s 6d gal, 5 gal drum 10s gal. The manufacturer recommends that for both materials the surface of the concrete be first primed with a coating of the material diluted in an equal volume of water.
(The Flintkote Co Ltd, Adam House, 1 Fitzroy Square, London W1.)

Mulseal is an emulsion containing a natural rubber latex dispersed in bitumen. The manufacturer recommends a priming coat to be applied at the rate of 12 sq yd per gal. This priming coat is the Mulseal itself well diluted in water. Mulseal should then be applied in two coats, the first at 6 sq yd per gal, the second at 8 sq yd. The surface should be blinded with clean sharp sand before the second layer of concrete or the screed is poured to protect the membrane. Cost: 40 gal drum 10s 8d gal, 10 gal drum 11s gal, 5 gal drum 12s 6d gal.
(Expandite Ltd, Chase Road, London NW10.)

RIW Liquid Asphaltic Composition is a material based on natural asphalt. It is not a bitumen emulsion or a bitumen solution. It is applied in two coats, the second at right angles to the first. The first coat should be spread at 9 sq yd per gal, the second at 14 sq yd. At least 24 hours should elapse between application of coats and the second should be applied at right angles to the first. Cost: 40-45 gal drum 15s 6d gal, 5 gal drum 17s 8d gal. Also available in 250 and 125 gal drums.
(RIW Protective Products Co Ltd, 325 Whitehorse Road, Croydon, Surrey.)

Setcrete No 10 is a bitumen emulsion. It is applied in two coats, each of which should be limited to cover 6 sq yd per gal. The screed on top of the Setcrete should be 1in thick minimum. One of the features of this material is that it may be applied whilst the base concrete is still damp.
Cost: 40 gal drum 10s gal, 10 gal drum 11s gal, 5 gal drum 11s 6d gal.
(Quickset Water Sealers Ltd, 20 Albert Embankment, London SE1.)

Synthaprufe is a bituminous emulsion made from the by-products of coal and containing a high percentage of rubber. It is applied in two coats, the first at 6 sq yd per gal, the second at 8 sq yd. The first coat should be allowed to dry before the second is applied and the final coat should be blinded with sharp sand when tacky. Synthaprufe should be used as a sandwich layer. Cost: 40 gal drum 12s gal, 10 gal drum 13s 6d gal, 5 gal drum 14s 6d gal.
(National Coal Board (South-Western Division), Marketing Department (By-Products), National Provincial Bank Buildings, Docks, Cardiff.)

Tretol is a bitumen solution. It is applied in two coats, the first at 15-20 sq yd per gal, the second at 25 sq yd. When applied to the top of the base concrete the Tretol membrane should be covered with a screed 1½-2in thick. Cost: 45 gal drum 8s 6d up to 13s gal (20?T), 45 gal drum 9s 6d up to 14s gal (200T).
(Tretol Ltd, 2 Caxton Street, London SW1.)

Ventrot is a blend of bitumen. It is applied hot, to a thickness of ⅛in, in two coats; the first coat, known as Ventrot solution primer, at 20-30 sq yd per gal and the second at 22-25 sq yd per gal. Cost: Ventrot solution primer 40 gal drum 7s 6d gal, 10 gal drum 8s 6d gal, 5 gal drum 9s gal. Ventrot 3 cwt drum 59s cwt, 1 cwt drum 69s, ½ cwt drum 74s.
(Plycol Ltd, Dundee Road, Trading Estate, Slough, Bucks.)

Integral concrete waterproofers: BRS Digest No 86 states that, *whilst these may improve the resistance of concrete to liquid water penetration, they do not materially affect its permeability to water vapour*. There are a number of proprietary waterproofing compounds on the market. These will be dealt with in a later Information Sheet.

Polythene sheet: This material has only been developed in recent years for use as a damp-proof membrane. It is completely impervious to water and has a low rate of water vapour transmission. Care should be taken, in laying, to ensure that the sheet is not punctured, either by the uneven surface of the concrete or by any traffic on it during subsequent operations. When the polythene sheet is laid on top of the hardcore it should be separated from it by a blinding of sand 1in thick (minimum). Even when the sheet is used as a sandwich layer between concrete and screed, a ½in thick blinding of sand should be laid on the concrete. Joints should be well lapped, and one manufacturer recommends a double welt fold which is kept in place by laying bricks or timber on the fold at intervals until pouring the screed. Manufacturers usually recommend the 0·005in thickness for most normal applications. As with all other damp-proof membranes the polythene sheet must be made continuous with the damp-proof course in the walls. Names and addresses of manufacturers of polythene sheet may be obtained from the British Plastics Federation Ltd, 47 Piccadilly, London W1.

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Information Sheet No 1047 UDC 69·025
Floors, Ground: General

FLOORS ON THE GROUND: THERMAL INSULATION 28.C1

This Sheet describes the purpose and requirements of thermal insulation of solid ground floors and the range of materials which may be used.

General

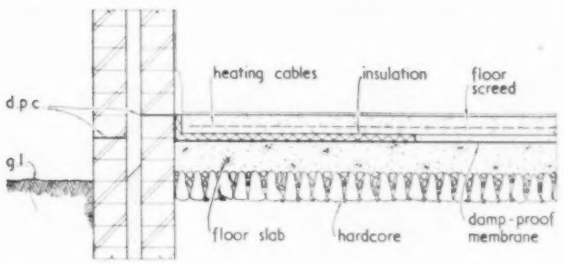
The Model By-laws—Series IV—require that the ground floor of every habitable room *shall be of such materials and be so constructed as to offer adequate resistance to the transmission of heat from inside the house to the outside* clause 78 (1). These provisions are deemed to be satisfied if the floor is concrete laid upon the ground or upon hardcore filling. The by-laws set a minimum U-value for housing of 0·25 for suspended ground floors, a figure well below that achieved by a suspended concrete slab alone. If a value higher than that given by a concrete slab is required, then insulation should be provided.
An extract from the amended by-laws (clause 78) is given at the end of this sheet.

Electric floor warming

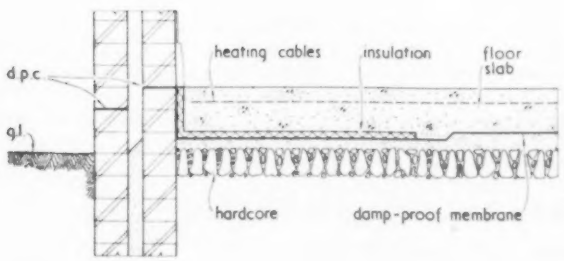
The use of electric floor warming in a solid ground floor creates the problem of heat loss into the ground through the slab. When the ground is dry it has been found that the highest proportion of heat loss is around the edge of the slab. It is normal, therefore, to provide perimeter insulation. If moisture is present in the subsoil (if, for example, the subsoil is damp clay) heat loss is considerable and complete thermal insulation as well as a damp-proof membrane is essential.

Perimeter insulation

The drawings illustrate alternative methods of providing perimeter insulation. The first method is used when the insulation is placed between the floor slab and the screed which contains the heating cables; the second method when the insulation is beneath the floor slab. In this case the floor slab may be used for heat storage. Both methods require the insulation to be carried up the wall for the full thickness of screed, or screed and slab as the case may be, to the finished floor level. The Electrical Development Association recommends that the width of insulation should be between 2 and 3ft according to the size of the room. It also suggests an alternative detail in which the insulation is placed against the inside face of the external wall, for a minimum depth of 12in below the level of the damp-proof membrane. In this case it recommends the use of 1in thick non-absorbent expanded polystyrene or rubber as the insulating material.



insulation above floor slab



insulation below floor slab

Materials for insulation

The following materials are suitable for perimeter and oversite insulation.

Mineral wool: Dense mineral wool mats or boards of a minimum thickness of ¾in.

Glass fibre: Resin-bonded glass fibre, weighing not less than 6 lb per cu ft, minimum thickness ¾in.

Cork: Cork slabs of a minimum thickness of 1in.

Expanded rubber: Expanded rubber of a minimum thickness of ¾in.

Expanded polystyrene: Expanded polystyrene of a minimum thickness of ¾in. The following manufacturers produce expanded polystyrene for thermal insulation: Jablo Plastics Industries Ltd., Jablo Works, Waddon, Croydon, Surrey (*Jablite*); The Marley Tile Co Ltd, Sevenoaks, Kent (*Marleycel*) ; The Baxenden Chemical Co Ltd, Paragon Works, Baxenden, Accrington, Lancs (*Spandoplast*). Further information may be obtained from the British Plastics Federation Ltd, 47 Piccadilly, London w1.

Extract from amended by-laws

The following is extracted from the circular on Building By-laws issued by the Ministry of Housing and Local Government, 4th December 1959:

THERMAL INSULATION

The revised model by-law 78 lays down standards of thermal insulation in domestic buildings higher than those previously laid down. Examples are listed in the fifth schedule of forms of construction which will satisfy the thermal transmittance co-efficients (U values) mentioned in the mandatory requirements of the by-law. These examples are not exhaustive and it will be necessary for any form of construction not listed to be considered on its merits. For the purpose of determining the thermal transmittance co-efficient of any structure reference may be made to the publication of the Institution of Heating and Ventilating Engineers entitled *A guide to current practice*.

(7) The floor next to the ground of every building or part of a building to which this by-law applies, or any floor thereof which projects or is otherwise so situated that its lower surface is exposed to the outer air, shall—
(a) be so constructed that, when the sum of the surface resistances of the upper and lower surfaces of the floor is taken at 1·00, the thermal transmittance co-efficient of the floor is not more than 0·25; or

(b) be constructed of suspended timber joists and tongued

FLOORS ON THE GROUND: THERMAL INSULATION

and grooved boarding not less than five-eighths of an inch in thickness with or without the addition of any other material and having the space beneath the lowest timbers in the floor enclosed by walls on all sides apart from any necessary openings to afford ventilation; or

(c) be constructed of concrete laid upon the ground or upon hardcore filling.

(8) *A floor shall be deemed to have the resistance to the transmission of heat required by sub-paragraph (a) of the previous paragraph if it is insulated in a manner provided in Table C of the [fifth] schedule.*

(9) In this by-law—
"thermal transmittance co-efficient" means the number of British thermal units transmitted per hour through one square foot of the structure when there is a difference in temperature of one degree Fahrenheit between the air on the two sides of the structure;
"surface resistance" means the reciprocal of the surface heat transfer co-efficient; and
"surface heat transfer co-efficient" means the amount of heat in British thermal units transferred per hour between each square foot of surface and the surrounding air when there is a difference in temperature of one degree Fahrenheit between the surface and the surrounding air.

TABLE C FLOORS

Type of floor

1. *Floor of tongued and grooved boarding not less than five-eighths of an inch in thickness on timber joists the space beneath which is not enclosed by walls on all sides, as is required by sub-paragraph (b) of paragraph (7) of by-law (78).*

Type of insulation

(a) Either of the following fixed under the joists:

(i) *wood wool slabs not less than one and a half inches in thickness:*

(ii) *compressed straw slabs not less than two inches in thickness.*

(b) Any ceiling with any of the following between the ceiling and the floor boards:

(i) *fibre insulating board not less than one-half of an inch in thickness;*

(ii) *expanded polystyrene not less than one-half of an inch in thickness;*

(iii) *crumpled aluminium foil or combined corrugated and flat aluminium foil laid with the corrugated surface downwards if in contact with the ceiling;*

(iv) *double or single sided paper reinforced aluminium foil laid with an air space between it and the ceiling;*

(v) *mat, slab or quilt, not less than three-quarters of an inch in thickness, of eel grass or of glass, slag, mineral or rock wool;*

(vi) *nodulated slag wool to a thickness of not less than one and a half inches;*

(vii) *gypsum granules to a thickness of not less than one inch;*

(viii) *expanded vermiculite to a thickness of not less than one inch;*

(ix) *nodulated polystyrene not less than one inch in thickness.*

Type of floor

2 *Floor of concrete which is not laid upon the ground or upon hardcore filling.*

Type of insulation

Any of the following fixed under the concrete:

(i) *wood wool slabs not less than two inches in thickness;*

(ii) *compressed straw slabs not less than two inches in thickness;*

(iii) *expanded polystyrene not less than three-quarters of an inch in thickness;*

(iv) *cork board not less than one inch in thickness.*

Note: The types of insulation described in Table C in the above extract are only required when the floor is exposed to the outer air or an unheated space on the underside.

TRETOL BITUMEN MEMBRANES in solid concrete floors

SfB (23) Ls2
UDC 69.022.1/4

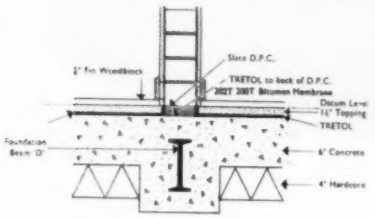
Type

Cold applied pure bitumen solutions—supplied ready for use, do not require heating or thinning.

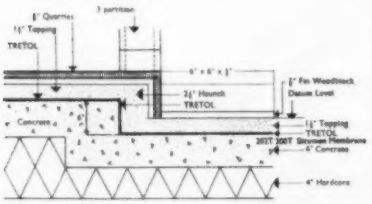
Function

To provide a horizontal membrane which is completely impermeable to rising moisture and moisture vapour.

Where solid floors are to receive floor covering, it is essential to use a continuous bitumen membrane. This is necessary, not only to prevent rising damp but also rising moisture vapour, since both of these



are injurious to most types of floor covering. Another factor of major importance is that dry floors are warm floors. When dampness is kept away from the final screed, a valuable contribution to better thermal insulation is made. The system covered by this Specification Sheet conforms to the requirements of housing authorities throughout the country and complies with the description relating to cold applied bitumen solutions in solid concrete floors in



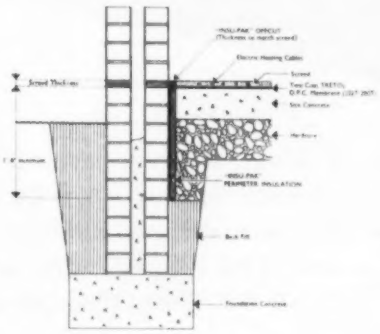
Building Research Station Digest No. 86. The Tretol Cold Applied D.P.C. System consists of two materials—Tretol Bituminous D.P.C. Solution No. 202T and Tretol Bituminous D.P.C. Solution No. 200T which are both applied cold by brush. The first coat—No. 202T—is of thinner consistency to penetrate the concrete in addition to forming the necessary covering. The second coat—No. 200T—is thicker and heavier, and the combination of the two materials provides the necessary built-up elastic membrane.

Under Floor Heating

The combined use of Bitumen Membranes and Perimeter Insulation.

Metal Covered heating elements

The choice of the correct membrane is particularly important where underfloor heating systems are employed. Certain types of emulsifying agents contained in bituminous emulsion (water type) are known to have a corrosive effect on non-ferrous metals used for many types of heating elements. The use of cold applied membranes should, therefore, always be confined to suitable grades of bitumen solutions. Tretol Bitumen Membranes are manufactured from pure bitumen in solution form and are entirely satisfactory for use with all types of metal covered



heating elements since they are warranted not to stimulate corrosion.

Illustrated above is a typical example of the use of the standard Tretol Bitumen Membrane in conjunction with Insu-Pak Perimeter Insulation. The latter is manufactured and marketed by Tretol-Servicised Ltd. and is used to insulate the ground floor slab and screed from the vertical concrete and brickwork.

Plastic covered heating elements

Where plastic covered heating elements are incorporated in the floor, it may be necessary to isolate the elements from the membrane by placing the latter at a lower level in the construction. We shall be pleased to send suggested specification upon receipt of details of the construction and type of element to be used.

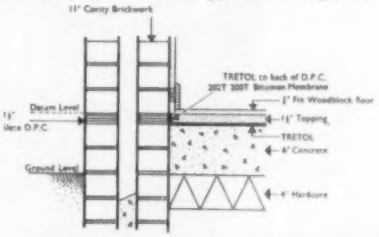
Preparation

The base concrete slab must be surface dry before treatment. It should be swept with stiff brooms to remove treadings of sand, dirt, etc.

Application

By brooms, tar brushes or squeegees.

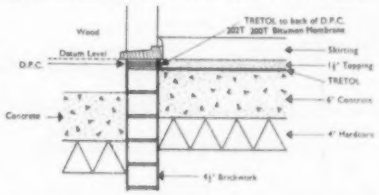
First coat to consist of Tretol Bituminous D.P.C. Solution No. 202T. Second coat to be applied only when first coat is dry and to consist of Tretol Bituminous D.P.C. Solution No. 200T. This second coat, whilst still wet and tacky, should be gritted



with a fairly coarse sand or light aggregate to provide a key for the screed which follows.

Where Insu-Pak Perimeter Insulation is used, the membrane should be continued over the top edge of the Insu-Pak and taken up the vertical face of the concrete or brickwork finishing flush in line with the top surface of the screed. An off-cut of Insu-Pak shall then be placed in position over the membrane.

All applications to surface dry concrete, intervals of 24-hours to be allowed between applications of first coat and second coat



and final screeding. It is recommended that the screed should be a minimum 1½in. to 2in. in thickness.

Quantities

First coat (No. 202T) to be applied at the rate of between 15-20 square yards per gallon.

Second coat (No. 200T) to be applied at the rate of 25 square yards per gallon.

Slight variations in coverage may occur as a result of difference in surface texture.

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Tretol CONCRETE liquid Waterproofer

Function

Waterproofing Concrete of a structural nature:
FOUNDATIONS, DUCTINGS, FLOOR SLABS, RETAINING WALLS, COLUMNS, BOILER HOUSES, BEAMS, UNDERGROUND GARAGES, ETC.

Type

Concentrated Liquid used diluted with gauging water.

Effect of Use

Waterproofs efficiently without adversely affecting compressive strength of Concrete. Its incorporation in mix will provide some reduction in water/cement ratio.

SPECIFICATION

Tretol *Concrete* Liquid waterproofer to be added to ganging water in the proportion of:

1 part Waterproofer to
25 parts Water.

Gauge and mix in normal fashion reducing water/cement ratio to provide the desired slump.

Results of percolation tests made in the R. H. Stanger Laboratories on 2″ thick specimen containing TRETOL RENDERING LIQUID WATERPROOFER.
Each pressure maintained for 1 hour.

Water pressure	Foot Head	Quantity of water percolating through specimen per hour
30lb psi	69	Nil
50lb psi	115	Nil
100lb psi	230	Nil
150lb psi	345	Nil

Tretol RENDERING liquid Waterproofer

Function

Waterproofer internal and external renderings and floor screeds of basements and cellars, waterproofing of tanks and pits. Interior Waterproofing of walls with defective DPC. Waterproofing mortar for external plastering, shingle or Spar Dashing and Roughcasting.

Type: **CONCENTRATED LIQUID—used diluted with gauging water.**

Effect of Use

Permanent Waterproofing: Improved workability, adhesion and finish of Rendering. Reduction of cracking and crazing by retarding loss of gauging water.

SPECIFICATION

TYPE OF WATER-PROOFING WORK	METHOD	MIX AND DILUTION RATE
Basements, Cellars, Water-containing Structures.	(1) First render walls 3 coats each ¼″–¾″ total 1″. Working joints should not occur at vertical angles or coincide in successive coats. Form concave fillets at all angles. (2) **LAY FLOOR LAST** in one operation 1½″–2″ thick, concave fillets at angle of wall and floor—bullnose corners.	2½ parts clean, sharp sand, 1 part fresh Portland Cement. *Dilution*—1 part Tretol Rendering Liquid Waterproofer to 20 parts gauging water.
IMPORTANT NOTE—It is necessary to obviate water pressure or penetration during work and for 5-7 days after completion.		
Interior walls having defective d.p.c.	(1) Render 2 coats to total thickness of ½″–¾″ to at least 18″ above visible level of dampness. (2) (Optional) Dig soil away to foundations and render to 6″ above normal soil level externally.	2½ parts clean, sharp sand, 1 part fresh Portland Cement. *Dilution*—1 part Tretol Rendering Liquid Waterproofer to 20 parts gauging water.
External wall plastering. (1) Shingle or Spar Dashing. (2) Roughcasting. (3) Plain Rendering.	(1) Render and scratch first coat: allow to set but apply second whilst damp. Dash with pea gravel, chippings, etc., and press in with trowel. (2) Render and float as above but throw on roughcast whilst 2nd coat still plastic. (3) Render and float in 3 coats to total thickness of ½″–1″.	4½ to 5 parts clean, sharp sand, 1 part fresh Portland Cement. *Dilution*—1 part Tretol Rendering Liquid Waterproofer to 30 parts gauging water.

Note: All renderings to be kept damp for 4 to 5 days following completion.

Preparation

Remove old decorative material where present. Close-hack Concrete surfaces. Rake out brick joints ½″—¾″ deep and score bricks. Wash dust off all surfaces and leave damp.

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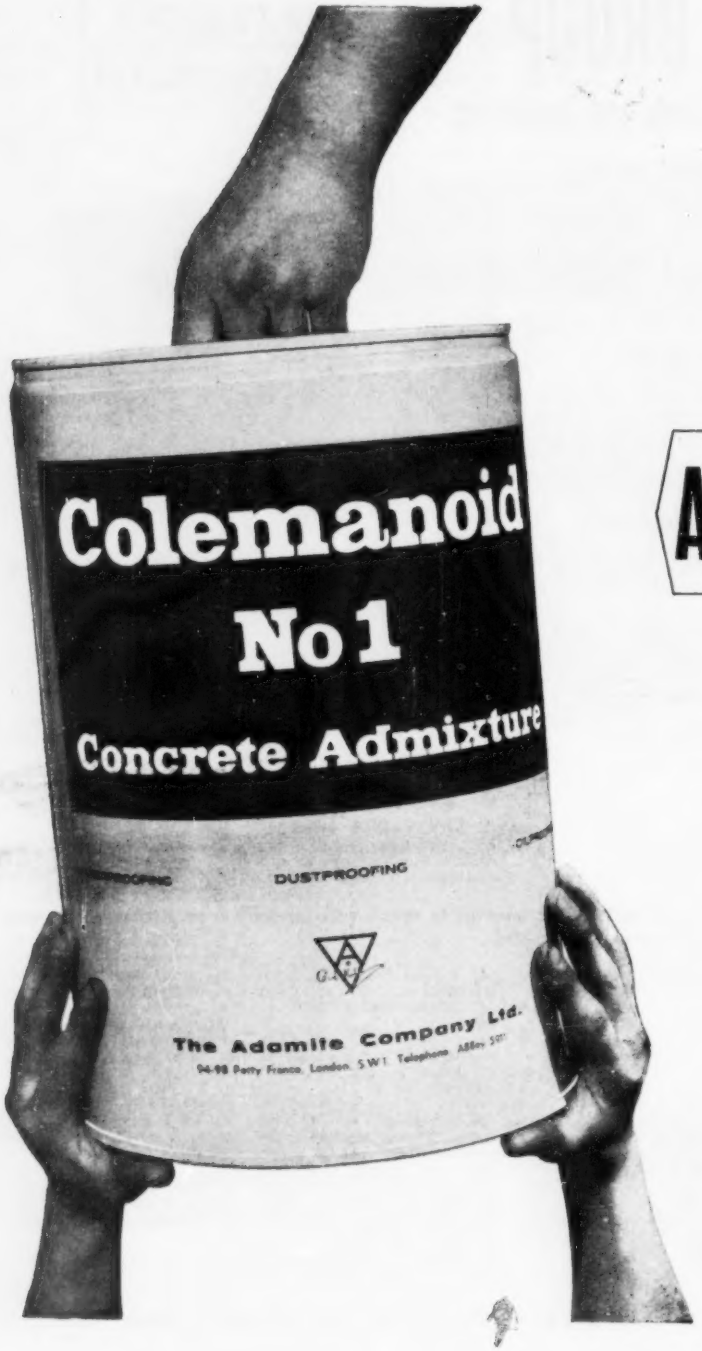

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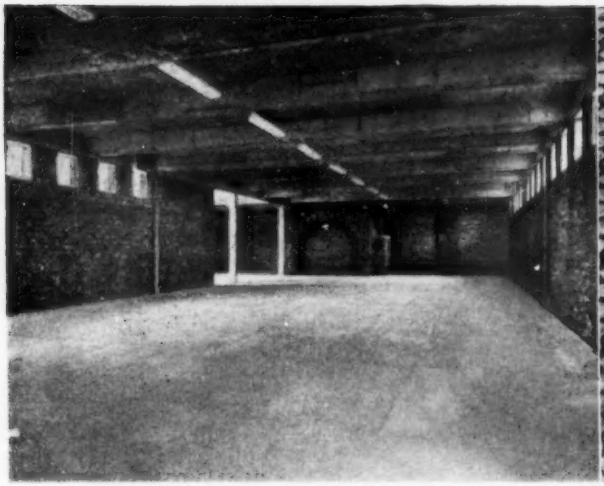
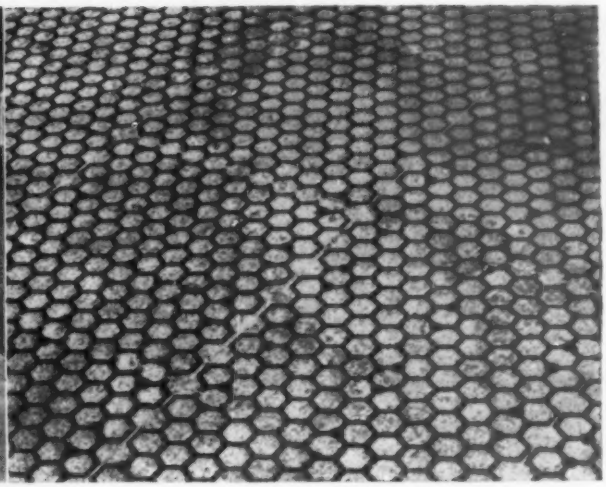
Granolithic Paving



Cast Iron Floor Plates



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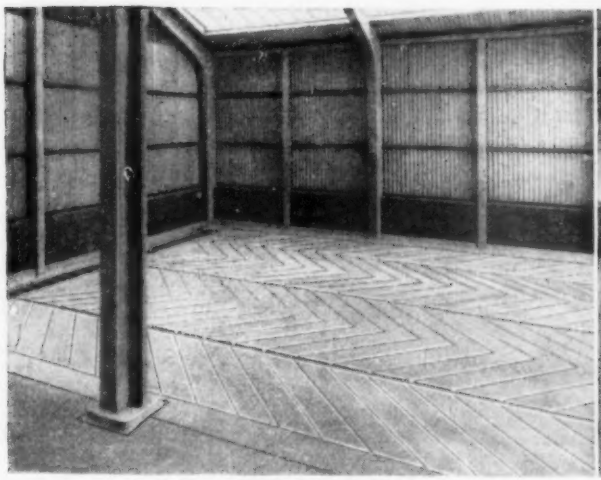
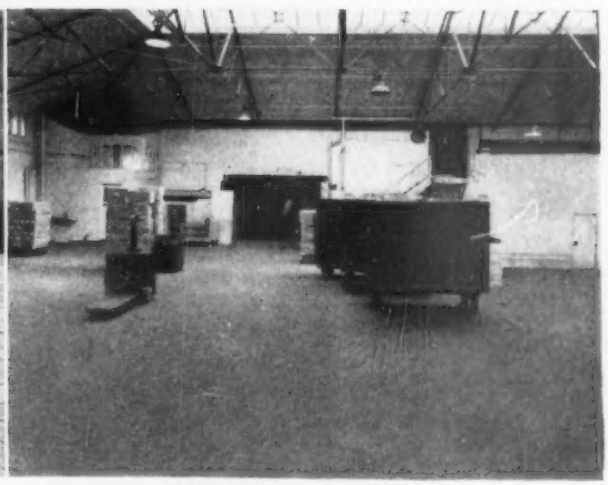


Grooved Granolithic Paving



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Playgrounds and Recreation Spaces

Introduction by Alfred Ledermann and Alfred Trächsel. Translated by Ernst Priefert. Size 8¾ by 11⅛in. 176 pages with 302 halftones and 83 line illustrations. 63s. net. postage 2s. 0d.

It is now recognised by planners and local authorities that imaginatively-designed children's playgrounds and adult recreation spaces should be regarded as an essential amenity for all urban areas of any size, whether new or old; but so far very few really successful examples have appeared in the British Isles, and children in towns and cities continue, at their peril, to play their games in streets and on roads. On the Continent, in Scandinavia and in the U.S., however, the subject is being tackled with the seriousness and care that it deserves, and there are many interesting and successful solutions to be seen.

This book, after short introductory essays written by two of Europe's leading playground designers, consists of photographs and plans of a great variety of interesting examples taken from many countries. Each of the schemes illustrated is accompanied by a short explanatory text, together with notes on constructional details. Examples shown range from the smallest and most inexpensive to large schemes covering many acres, and they contain a wide variety of ingenious ideas, constructions and equipment for play and recreation.

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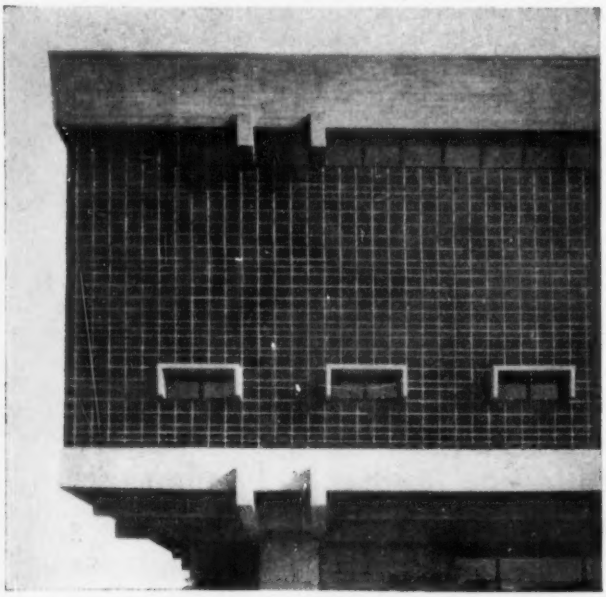

New Japanese Architecture

by Udo Kultermann

Western opinion has an ideal image of modern Japanese architecture: spare, elegant, informal. While the work of Junzo Sakakura seemed to support this, there is an increasing awareness that in Kenzo Tange Japan possesses an architect who probably ranks with the world's top ten, but practises an entirely different kind of architecture.

Dr Kultermann's book shows how different the work of Tange and other leading Japanese architects has turned out to be. It is not afraid of mass, thickness and solidity; not afraid of bold plastic and sculptural forms; not afraid to mate the most advanced technology with the most hallowed traditional usages.

All these qualities are brought out in dramatic photographs, backed by analytical texts and biographies of leading architects. Since some of these men were born within a few years of Mendelsohn and Le Corbusier, the modern architecture of Japan rests on a tradition almost as old as that of the West. As a result, Japan's new architecture has nothing unpractised or unconvincing about it, but is already so secure in its aims that the Japanese themselves speak of it not as a foreign importation, but simply as the re-awakening of Japanese architecture.

The Architectural Press
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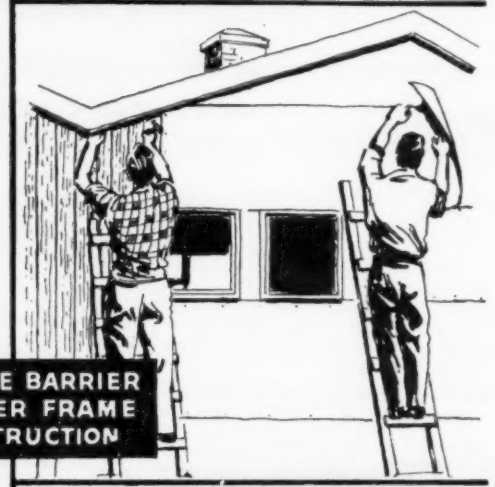

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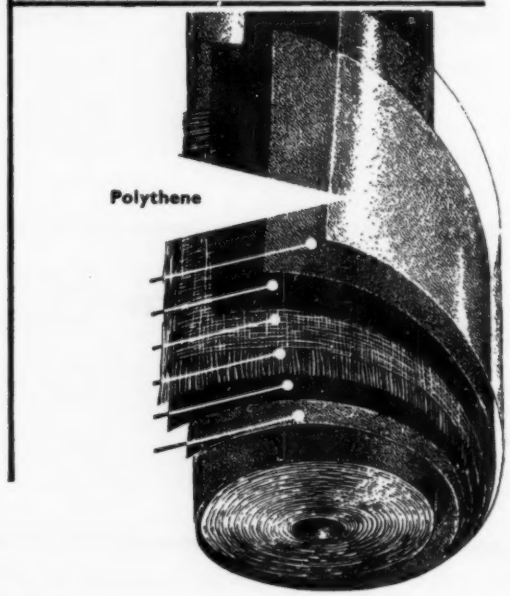
Underlay to concrete
Separation layer between concrete
Curing concrete
Form lining
Protection from frost
Temporary tarpaulin



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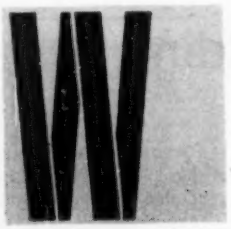
Wincilate SfB—a correction

DMA Design Limited, advertising consultants to the Wincilate Group regret that, due to an error at the engravers followed by an oversight in proof reading, the two Wincilate information sheets relating to slate cladding and slate copings which appeared in the December 13th issue of this journal were incorrectly titled.

DMA Design apologise for any confusion or inconvenience caused by the inadvertant transposition of the titles and, in the following pages, re-issue the two Wincilate information sheets under their correct headings.

DMA Design Ltd, 16 Carlisle Street London W1, tel: GER 0285

(21)Fe5 Wincilate slate cladding



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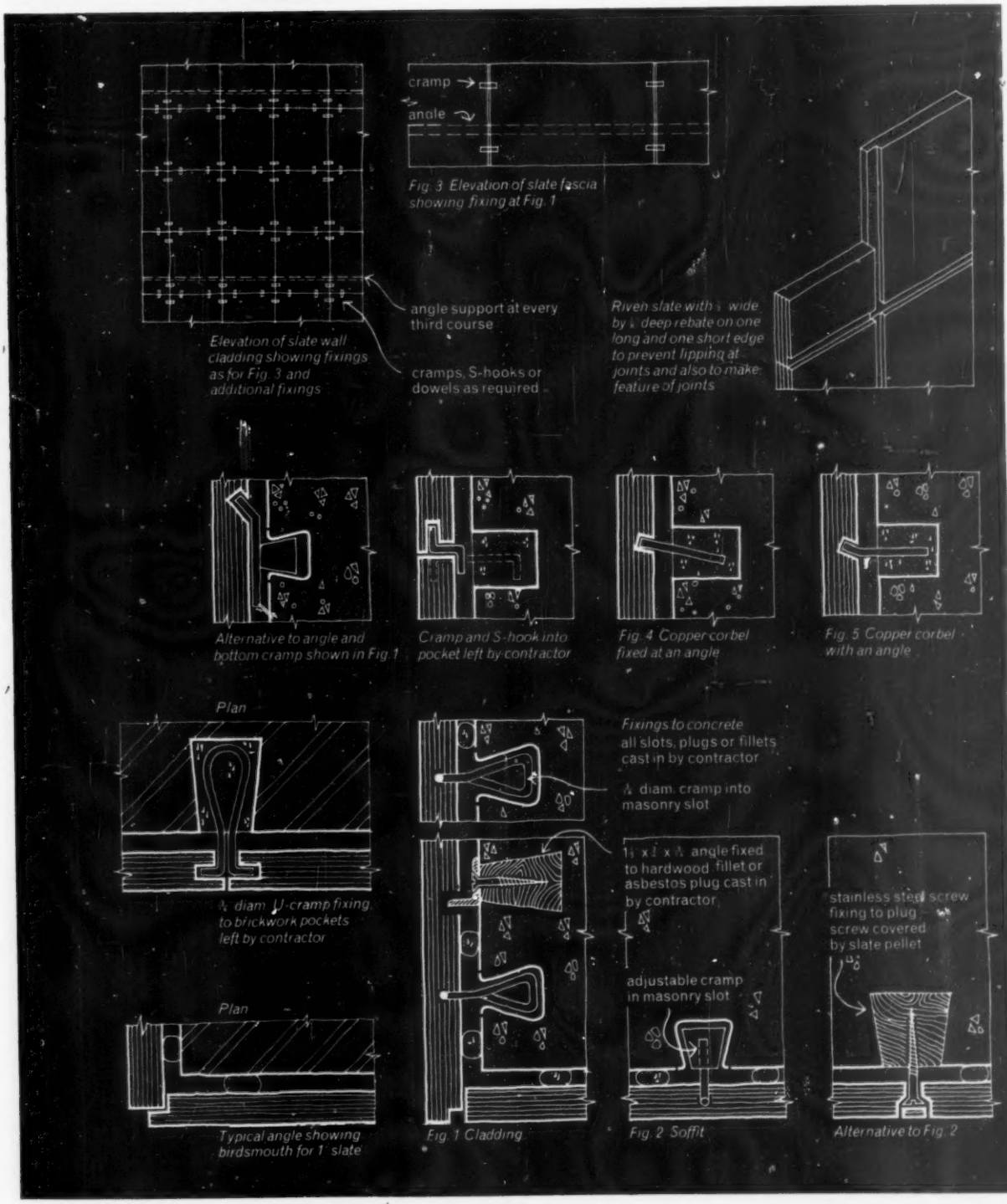
Enamel Company Ltd.
The Town Hall
Bow Road, London E3
Telephone: Advance 2203

Works:
Bow and Battersea
Quarries:
Aberllefeni, North Wales

S f B File Number

(21)Fe5 Wincilate slate cladding



Wincilate slate cladding

Material
Slate is a particularly suitable material for cladding as it can be obtained only 1-in. thick and, under certain circumstances, may be supplied even in ¾ in. It is chemically inert, non-porous and does not warp, shrink or rot.

Description
The cladding is supplied in square or rectangular slabs scored on the back to give a key for fixing and smooth or textured on the face according to requirements; the following three finishes are available:
Fine rubbed or polished: This gives the slate a dark smooth sheen or a matt eggshell finish.
Frame sawn: The surface has a vertically corrugated texture. It appears lighter in colour than the above finish.
Natural riven: This is the surface obtained from the natural cleavage of the slate and is consequently roughest in texture. It can be supplied rebated on two adjacent edges which gives a panelled effect to the slabs (see drawing on face of sheet).

Sizes
For ease of handling and fixing it is recommended that slabs from 2 ft. 0 in. to 3 ft. 0 in. long and 1 ft. 0 in. to 2 ft. 0 in. wide be used. Larger slabs could be supplied against specific orders except in natural riven finishes, which are limited to comparatively small sizes. The standard dimensions suggested are 3 ft. 0 in. by 1 ft. 6 in., 2 ft. 6 in. by 1 ft. 3 in., 2 ft. 0 in. by 1 ft. 0 in., or square slabs of equivalent area. These sizes may be varied within the limits described above in 3 in. units with no cost increase. Intermediate sizes are supplied if required.
The minimum thickness recommended for fine rubbed and frame sawn finishes is normally 1 in., the maximum being 2 in. Where apron cladding between windows or a string course of a similar kind is required, ¾ in. thickness may be used, provided the height does not exceed 1 ft. 9 in. The natural riven finish varies up to $\frac{7}{16}$ in. thickness on its face texture and two thicknesses are recommended: 1 in. average and 1¼ in. average. When natural riven slabs are supplied with a rebate on adjacent edges, the thickness of slate at the rebate will be ¾ in. and 1⅛ in. respectively.

Weight
A slab 3 ft. 0 in. by 2 ft. 0 in. by 1 in. thick weighs slightly over ¾ cwt.

Fixing
Various forms of fixing are illustrated on the face of the sheet and their uses are described in the following notes.

Large wall areas: The following recommendations have been designed to simplify fixing; slate slabs drilled for normal cramp holes and S hooks can be supplied if required. The slate slabs are fixed with $\frac{3}{16}$ in. dia. cramps and inserted into a pre-prepared masonry slot.
Where the lower edge of the facing does not receive direct support from the structure, the lowest course of slabs (and at approximately each 10 ft. 0 in. level) should be supported by a non-ferrous metal angle screwed back to hardwood fillet or asbestos plug pre-prepared by the Contractor and cast in the concrete, either continuous or in lengths of 1 ft. 6 in. at the joints (see detail on the face of the sheet). In addition, the bottom course is tied back to the concrete by means of a $\frac{3}{16}$ in. U-shaped cramp as illustrated.
For fixing to brickwork, fishtailed cramps may be used in place of dovetailed cramps to avoid having to cut the brick; in all other respects the fixing is similar. Slate fixed on the above principle should have a ¾ in. minimum gap for bedding and mortar pads used as shown, one to each corner of a slab and one in the centre.
Where a large building is involved and the corbel cramp is used (shown on face of sheet as alternative to Fig. 1) if, as often happens, variations in the concrete occur, a hole should be left out by the Contractor for copper corbels to be used (see Figs. 5 and 4). These will overcome any variations in alignment and will be used according to conditions on site.
Apron cladding and plinths: For suspended cladding not exceeding 1 ft. 9 in. in depth and also short returns, U-shaped cramps or cramps and S hooks are suggested for use between joints and the course supported with a non-ferrous metal angle (as previously described for bottom course of large wall areas). Slabs should be scored on the back.
Soffits: It is most important that architects ensure that adequate fixings for any soffits are pre-prepared on site. An adjustable cramp for masonry slots may be supplied with the slate, or the soffit may be fixed by screws, the heads of which are covered by a slate button after fixing (see face of sheet).
Weathering: Where there is a set back in the surface to be faced, the slabs should be bedded on the horizontal projection with a slight fall to act as a weathering, the underside of the outer edge being provided with a ¼-in. check throating where it is jointed to the vertical slabs below. Bottom edges may be bevelled towards the back of the cladding as an alternative.

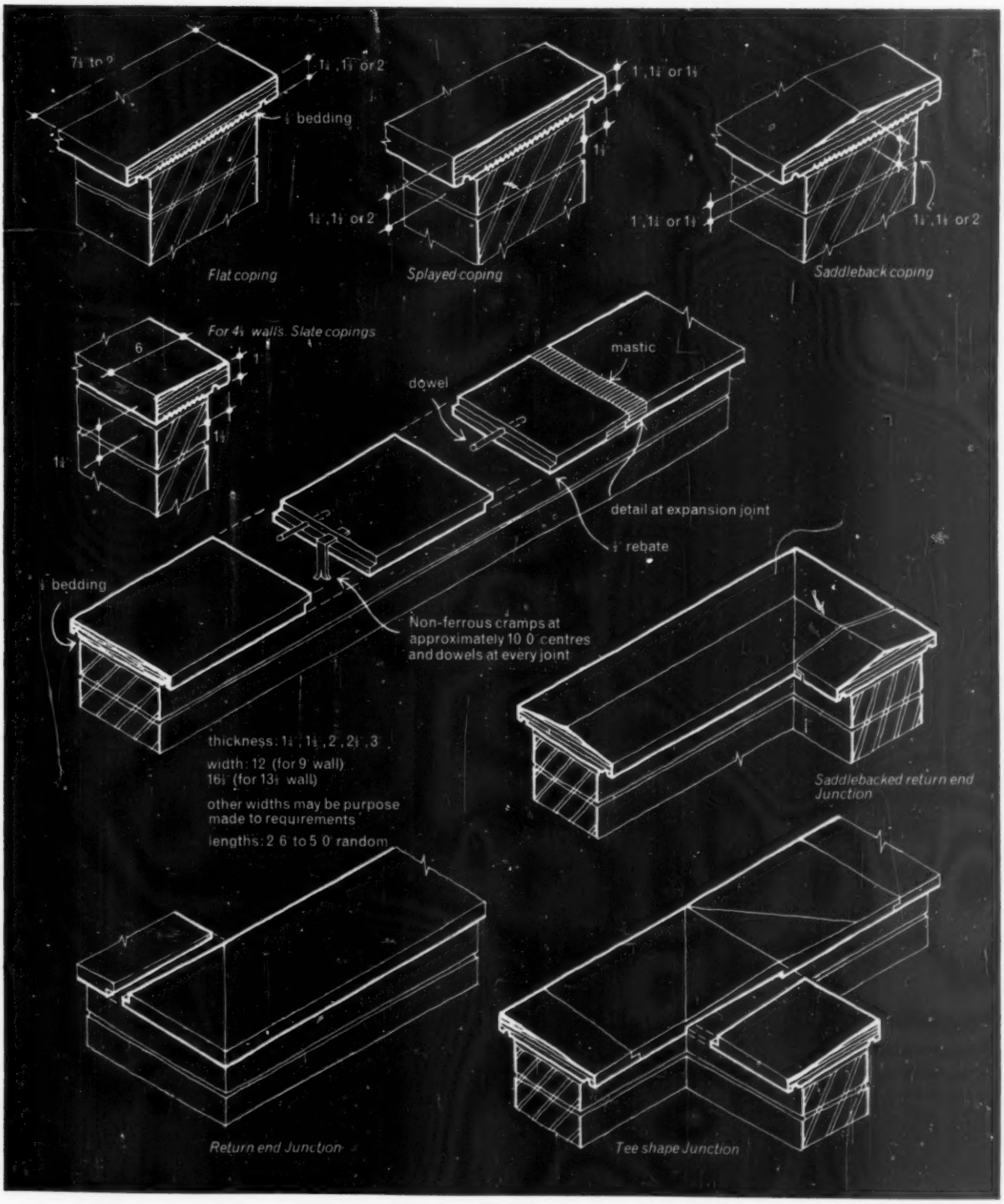
(21) Fe5 Wincilate slate copings

The Bow Slate and
Enamel Company Ltd.
The Town Hall
Bow Road, London E3
Telephone: Advance 2203

Works:
Bow and Battersea
Quarries:
Aberllefeni, North Wales

S f B File Number

(21) Fe5 Wincilate slate copings



SfB (21) Fe5

Wincilate slate copings

Material
As slate is chemically inert, non-porous and does not warp, shrink or rot, it is particularly suitable for copings and cappings. The need for damp-proofing is eliminated. Slate copings are effective where a precise skyline to a building is desired.

Description
Three types of slate coping are available: flat, weathered and saddleback. Each type is available in sizes to suit various wall thicknesses and may overhang the brick or concrete or lie flush with the wall face on one or both sides.
Flat coping: This is scored on the underside to provide a key for bedding and normally polished on the face and edges. Copings and cappings which overhang are grooved on the underside for throating.
Weathered coping: As for flat coping, this is scored on the underside, polished on the face and edges and, grooved for throating. In addition it is weathered in one direction for the entire width. The fall is normally ½ in., but this dimension may be varied.
Saddleback coping: As before, this is scored on the underside, polished on the face and edges and grooved for throating. In addition it is weathered in two directions from the centre to the edges. As for weathered copings, the fall is normally ½ in., but this dimension may be varied. For returned ends, the scoring is stopped and both throating and weathering returned. The details on the face of the sheet illustrate the various standard junctions in use. These may be varied to meet special needs. Normally the copings are made in straight lengths but, subject to certain limiting conditions, may be manufactured circular on plan. Joints between lengths of coping should always be specified as rebated to guarantee avoiding water penetration, although butt joints can be made satisfactory with due care in fixing.

Sizes
As shown on the face of the sheet, copings are supplied in sizes between 2 ft. 6 in. and 5 ft. 0 in. in length and, unless otherwise requested, will be manufactured in random sizes within these dimensions. The only exceptions are the junction pieces which are made of sufficient length to keep the joints between slate pieces away from the junctions: these sizes cannot, in the normal way, be increased.

Fixing
Slate copings should be fixed on ½ in. solid mortar bed (1:3 cement/sand). The joints between slate pieces should be as tight as possible (i.e. ⅛ in.) and pointed with a mastic. Pieces should be dowelled together by means of circular dowels at each joint. At approximately every 10 feet a $\frac{3}{16}$ in. non ferrous hook cramp should be used (see face of sheet) to anchor the coping. The cramps should be 2 in. long minimum to be effective.
The copings may be supplied drilled for cramps and dowels and the latter also supplied if required.
Architects should indicate expansion joints where necessary to allow for any possible building movement. These may be taken up by the use of large rebates on the joints (see face of sheet).

Finish
The slate used for the manufacture of copings and cappings is specially selected for the uniformity of its natural blue-grey colouring. Exposed surfaces are polished smooth.

CLASSIFIED ADVERTISEMENTS

Advertisements should be addressed to the Advt. Manager, "The Architects' Journal," 9-13, Queen Anne's Gate, Westminster, S.W.1.

Replies to Box Numbers should be addressed care of "The Architects' Journal," at the address given above.

AIR-MAIL SERVICE available on request.

In response to requests from a number of Overseas subscribers for air-mail delivery of Public and Official Appointment details and Other Appointments Vacant, we have been pleased to arrange that cuttings of all such classified advertisements appearing in the A.J., shall be despatched by air-mail on Wednesday of each week (one day prior to A.J. publication date). The cost of this special service to Overseas subscribers will be 5s. for four weeks (1s. 3d. for each additional week) and prepayments should be sent by subscribers wishing to take advantage of this service. The charge we are making represents only the actual cost of the postage involved.

Public and Official Announcements

36s. per inch; each additional line 3s.

CITY OF GLASGOW
ARCHITECTURAL & PLANNING DEPARTMENT
ASSISTANT ARCHITECTS
Salary up to £1,560 p.a.

This comprehensive office has an extremely interesting and vast programme of work to carry out during the next twenty years or so. The architectural and planning works include comprehensive redevelopment of urban areas, multi-storey buildings, schools of all types, colleges and various civic buildings.

The salary scale for these assistantships is up to £1,560 per annum with placing according to experience. Preference given to young and enthusiastic qualified men who have the ability but lack a real opportunity to apply it. There will be scope for personal initiative in this office.

A five-day week is in operation and the usual conditions concerning Superannuation apply.

Advances up to 100 per cent of valuation will be made available, where needed, for the purchase of suitable houses in or near Glasgow by successful applicants.

Please apply on application forms from the Principal Administrative Officer, 20, Trongate, Glasgow, C.1.

A. G. JURY,
City Architect & Director of Planning.
S9917

CORPORATION OF LONDON

The City Planning Department requires STAFF to assist on a number of planning projects at present in hand and others in course of preparation. These include the Barbican Commercial Zone where separated walkways are planned for a large area and the Tower of London Precinct. The work is varied and interesting and appeals to qualified Assistants with a fresh but disciplined approach to planning design.

Grade II/III, £990 × 10 increments to £1,310 p.a. (Two posts.)

Please apply in writing to the City Architect, Corporation of London, Guildhall, E.C.2, stating experience, present salary, etc. (no forms are issued). The posts are permanent and superannuated. S1442

ADMINISTRATIVE COUNTY OF LEICESTER

(*a*) PRINCIPAL ASSISTANT ARCHITECT (£1,410—£1,565).
(*b*) CHIEF ASSISTANT ARCHITECT (£1,310—£1,480).
(*c*) SENIOR ASSISTANT ARCHITECTS (£1,140—£1,310).
(*d*) ASSISTANT ARCHITECTS (£960—£1,140).
(*e*) ARCHITECTURAL ASSISTANTS (£815—£960).

Required for extensive school building programme and for design of New County Offices. Grading and commencing salary according to qualifications and experience. Applications to County Architect, 123 London Road, Leicester, giving qualifications and details of career to date. Removal expenses and lodging allowance may be paid to a married man. S1559

KESTEVEN COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT
ASSISTANT ARCHITECTS AND ARCHITECTURAL ASSISTANTS

There are various architectural appointments vacant in the County Architect's Department within A.P.T. Grades I to V (£645—£1,480 per annum).

Five-day week. The County Council operates a five-day working week.

Car Allowance. In approved cases essential car allowances are paid to Assistants on Grade II and upwards. There is an assisted car purchase scheme.

Lodging allowance. The Authority will consider granting an allowance of 30s. per week for a maximum of six months to married members of staff unable to obtain suitable accommodation.

Removal expenses. The Authority will consider assisting with the payment towards removal expenses.

Why not telephone Mr. J. W. H. Barnes, F.R.I.B.A., County Architect, and discuss the possibilities with him?

Applications, together with the names and addresses of two referees, should reach the Clerk of the County Council, County Offices, Sleaford, Lincs., not later than the 16th January, 1962. S1587

CITY OF LANCASTER
CITY ARCHITECT'S DEPARTMENT

Applications are invited for the post of ASSISTANT ARCHITECT in the newly formed City Architect's Department. Salary within Grade A.P.T. IV (£1,140 to £1,310 per annum).

The post is Superannuable and subject to N.J.C. Conditions of Service. A five-day working week is in operation and housing accommodation is available if required.

Applications stating age, qualifications, experience, past and present appointments, together with two referees to whom reference may be made, to be sent to Mr. E. A. Heppenstall, A.R.I.B.A., A.M.T.P.I., City Architect, Town Hall, Lancaster, by Tuesday, 2nd January, 1962.

J. D. WADDELL,
Town Clerk.

Town Hall,
Lancaster.
7th December, 1961 1555

CITY AND COUNTY OF NEWCASTLE UPON TYNE
CITY PLANNING DEPARTMENT

Applications are invited from suitably qualified and experienced candidates for the following post in the recently formed City Planning Department.

LANDSCAPE ARCHITECT, Scale "B" (£1,410—£1,670 p.a.) preferably with A.I.L.A.

The successful candidate will be responsible for preparing a comprehensive landscape policy plan for the City and the integration and co-ordination necessary for the realisation of this plan.

Commencing salary according to qualifications and experience.

The appointment is subject to the National Scheme of Conditions of Service, the Local Government Superannuation Acts, the passing of a medical examination, and the giving of one month's notice of termination on either side.

In approved cases the Council are prepared to offer to successful candidates:—

(*a*) Payment of 50 per cent. of total removal expenses up to maximum grant of £50.
(*b*) The tenancy of a dwelling which might be bought on the open market and let at an economic rent.
(*c*) A loan under Council's Housing Mortgage scheme up to 100 per cent. of valuation.

Applications stating age, qualifications, present and previous appointments and salary, experience, and names of two referees, should reach the City Planning Officer, Wilfred Burns, M.Eng., Dip.T.P., A.M.T.P.I., A.M.I.C.E., 2 St. Nicholas Buildings, Newcastle upon Tyne 1, by Monday, 15th January, 1962. S1590

METROPOLITAN BOROUGH OF ISLINGTON
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT

Applications are invited from persons not more than 50 years of age for the following appointment on the permanent staff.

One JUNIOR ARCHITECTURAL ASSISTANT, Grade A.P.T. II (£815—£960 p.a.) plus London weighting.

Applicants should have a sound knowledge of building construction with experience in the preparation of working drawings.

Application forms, returnable by first post on Monday, 8th January, 1962, obtainable from Borough Engineer and Surveyor, Town Hall, Upper Street, N.1.

H. DIXON CLARK,
Town Clerk.
S1593

BOROUGH OF TIVERTON
APPOINTMENT OF BOROUGH ARCHITECT

Applications invited from qualified Architects, preferably with local authority experience, for the new post of Borough Architect. The appointment is subject to J.N.C. conditions for Chief Officers (pop. range 10,000—15,000) on the scale £1,265—£1,485.

Applications, stating age, qualifications and experience, with the names of two referees, must be received by the undersigned not later than 8th January, 1962.

W. F. PUGSLEY,
Town Clerk.

6, St. Peter Street,
Tiverton, Devon. 1622

KINGSTON UPON HULL EDUCATION COMMITTEE
REGIONAL COLLEGE OF ART AND CRAFTS
Principal: A. D. S. SUGDEN, A.R.I.B.A., A.R.C.A., F.I.B.D.

SCHOOL OF ARCHITECTURE
Head of the School: A. ARSCHAVIR, M.A., A.R.I.B.A., A.M.T.P.I.

LECTURER required to take up duties as soon as possible.

The Diploma Course in Architecture is a full-time five-years' course, and the person appointed will be required to take part in the work of the School throughout the five years, but with special responsibility for the first year.

Candidates should hold a degree or Diploma of a recognised school and should have had a minimum of three years' professional experience. A wide interest in the arts generally, together with a specialist interest in a field of research, will be added advantages.

Salary: Burnham Technical Scale: £1,600 × £40 (5)—£1,800.

Application forms and further particulars, to be returned as soon as possible, may be obtained from the Chief Education Officer, Guildhall, Kingston upon Hull. 1615

NATIONAL COAL BOARD
NORTH EASTERN DIVISION

Require in Architects Branch at Conisbrough, nr. Doncaster:—

(*a*) Architect to act as LEADING ASSISTANT to Section Architect. The work covers wide and varied fields, and all stages of projects. Qualification A.R.I.B.A. Salary £1,000—£1,550. (Quote AA/647, A.J.)
(*b*) ARCHITECTURAL ASSISTANTS. The work is varied and interesting, covering sketch plan, working drawing and construction stages. Salary £825—£1,275. (Quote AA/648. A.J.)

All posts are superannuable, and carry concessionary coal entitlements. Five-day week, canteen.

Write for application form, quoting references shown above, to Staff Department, 16, South Parade, Doncaster, by 5th January. 1617

DEPTFORD BOROUGH COUNCIL invites applications for the following appointments:—

(*a*) PRINCIPAL ASSISTANT ARCHITECT, A.P.T. Grade V (£1,310 to £1,480 per annum) plus London "weighting" of £45.
(*b*) ARCHITECTURAL ASSISTANT, A.P.T. Grade III (£960 to £1,140 per annum) plus London "weighting" dependent on age of applicant.

Applicants must be suitably qualified, preferably with Local Government experience in the design of public buildings, and development of small housing sites.

The commencing salary will not necessarily be at the minimum of the scale.

Both appointments are superannuable and subject to N.J.C. Conditions. Five-day week and staff canteen. Applications, naming two referees, to Town Clerk, Deptford Town Hall, New Cross Road, S.E.14, by 12th January, 1962. S1619

BOROUGH OF CHESTERFIELD

Applications are invited for the following appointment in the Borough Engineer's Department (C. Bond, F.R.I.B.A., Chief Architect).

PRINCIPAL ASSISTANT ARCHITECT, Scale A (£1,480—£1,565).

A substantial programme of capital works has been approved in principle which includes a swimming bath, highways depot, social services centre and multi-storey flats.

Chesterfield, which has a population of nearly 70,000, is situated bordering the Peak District National Park.

A car allowance is payable and housing accommodation will be provided if requir A five-day week is in operation.

Applications, stating age, qualifications, training and experience, appointments held with dates and salaries, naming two referees, to the Borough Engineer, Town Hall, Chesterfield, not later than Monday, 8th January, 1962.

RICHARD CLEGG,
Town Clerk.
1614

BOROUGH O.' RAWTENSTALL
APPOINTMENT OF CHIEF ARCHITECT

Applications are invited for the appointment of Chief Architect in the Department of the Borough Engineer and Surveyor at a salary within A.P.T. V (£1,310—£1,480).

Applicants must be Associate Members of the R.I.B.A.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, the National Schemes of Conditions of Service, and the termination by one month's notice by either side.

Housing accommodation will be provided if required.

Further particulars may be obtained from the Borough Engineer and Surveyor.

Applications, including names and addresses of two referees, should reach the undersigned not later than Monday, 13th January, 1962.

Canvassing will disqualify. Any relationship to members or senior officers of the Council must be disclosed.

COLIN CAMPBELL,
Town Clerk.

Town Hall,
Rawtenstall,
Rossendale. S1613

CITY AND COUNTY OF NEWCASTLE UPON TYNE
CITY ARCHITECT'S DEPARTMENT
APPOINTMENT OF PRINCIPAL ASSISTANT ARCHITECT (NEW TOWN HALL)

Applications are invited for the above post at a salary in accordance with J.N.C. Scale "E" (£1,860 per annum rising by annual increments to a maximum of £2,120 per annum).

Applicants must have appropriate professional qualifications and the person appointed will be in charge, under the direction of the City Architect, of the section engaged solely on the New Town Hall, a project of some £4,000,000 in value. Work on the superstructure of the first stage is now well advanced and an exceptional opportunity is presented for working on a building carried out in materials of the highest quality.

Further details and form of application may be obtained on application in writing to George Kenyon, A.R.I.B.A., A.M.T.P.I., City Architect, Newcastle upon Tyne, 1.

JOHN ATKINSON,
Town Clerk.

Town Hall,
Newcastle upon Tyne, 1.
12th December, 1961. 1603

COUNTY BOROUGH OF TYNEMOUTH
BOROUGH SURVEYOR'S DEPARTMENT

Applications are invited for the post of CHIEF ASSISTANT ARCHITECT within the Grade A.P.T. V, £1,310—£1,480.

Applicants should be registered members of the Royal Institute of British Architects.

Conditions of appointment and application form can be obtained from D. M. O'Herlihy, Esq., O.B.E., B.Sc. (Eng.), M.I.C.E., 16, Northumberland Square, North Shields, to whom they should be returned by the 20th January, 1962.

Canvassing will be a disqualification.

FRED G. EGNER,
Town Clerk.

GAH/HG
13th December, 1961. 1639

CAERNARVONSHIRE COUNTY COUNCIL
CHIEF PLANNING ASSISTANT

APPLICATIONS invited for post of CHIEF PLANNING ASSISTANT GRADE A.P.T. IV (£1,140/£1,310) in the COUNTY PLANNING DEPARTMENT. Commencing salary within the grade according to qualifications and experience.

Applicants must be Corporate Members of the Town Planning Institute and should be University graduates or members of another appropriate professional institution.

Experience is required in carrying out work on the review of the County Development Plan, the production of Town Maps and Supplementary Town Maps including Comprehensive Development Areas.

Rented housing accommodation available if required. Closing date, 15th January, 1962.

Application forms and further particulars from Clerk of County Council, County Offices, Caernarvon. S1631

BOROUGH OF STAFFORD
APPOINTMENT OF SENIOR ASSISTANT ARCHITECT

Applications are invited for the above appointment on the permanent staff of the Borough Surveyor on Grade III (£960—£1,140 p.a.).

Applications, stating age, qualifications and previous experience, together with the names and addresses of two referees, must be received not later than 5th January, 1962, and to be addressed to T. H. Higson, Esq., B.Sc., A.M.I.C.E., Borough Surveyor, Mount Street, Stafford.

Housing accommodation will be provided by the Council if required.

T. BROUGHTON NOWELL,
Town Clerk.
1642

COUNTY OF KINCARDINE
COUNTY ARCHITECT AND PLANNING OFFICER

Applications are invited for the post of County Architect and Planning Officer. Applicants should be Architects, preferably with a planning qualification, and should have had practical experience in the whole-time service of a local authority.

The salary scale is £1,845 by annual increments of £70 to £2,125. Placing on the scale may be given in accordance with qualifications and/or experience. The post is superannuable and medical examination will be required.

A statement of the duties and conditions of appointment may be obtained from the County Clerk, 33, Evan Street, Stonehaven, with whom applications, including the names of three referees, should be lodged not later than 19th January, 1962.

13th December, 1961. 1633

CITY OF PORTSMOUTH
CITY DEVELOPMENT DEPARTMENT

Applications are invited for the appointment of a SENIOR DEVELOPMENT ASSISTANT, A.P.T. Grade IV (£1,140/£1,310). Applicants must have passed the Final Examination of the Town Planning Institute or equivalent.

Consideration will be given to the provision of housing accommodation for the successful applicant.

Application forms, obtainable from City Development Officer, 1, Western Parade, Portsmouth, to be returned by 12th January, 1962. S1643

UNIVERSITY COLLEGE OF SWANSEA

Applications are invited for the post of QUALIFIED ASSISTANT in the Buildings Section of the Registry of this rapidly expanding College at a salary within the scale £1,150 × £50—£1,400 × £75—£1,475. The successful applicant will be admitted to membership of the Federated Superannuation Scheme for Universities. Additionally, a non-superannuable family allowance of £50 per annum per child will be payable where appropriate.

Applicants should be members of the R.I.B.A. or R.I.C.S. and have had three years' post-qualification experience. Further particulars may be obtained from the undersigned to whom applications, quoting the names of two referees, should be submitted not later than Friday, January 5, 1962.

JOHN McINTYRE,
Registrar.
1635

HACKNEY BOROUGH COUNCIL
ENGINEER AND SURVEYOR'S DEPARTMENT
ASSISTANT ARCHITECTS AND ARCHITECTURAL ASSISTANTS

Applications are invited for these permanent appointments in the Architectural Section in Grades ranging between A.P.T. II (£815—£960 p.a.) and A.P.T. V (£1,310—£1,480 p.a.) plus London weighting allowance. 100 per cent. mortgage advances available in appropriate cases.

Grading and commencing salaries will be fixed according to training qualifications and experience.

The Department has on hand a heavy and varied programme of Housing Development and other architectural projects.

Application forms obtainable from Town Clerk, Town Hall, Hackney, London, E.8, returnable by 9 a.m., 13th January, 1962. S1634

HAMPSHIRE COUNTY COUNCIL
NEW FOREST AREA PLANNING OFFICER

AREA PLANNING OFFICER Scale D. (£1,710—£1,975) based on Lyndhurst in the New Forest required to replace Mr. F. F. Freeth who is eventually retiring. The officer appointed will work under the general direction of the County Planning Officer in planning the South-West Area of Hampshire and in the control of development.

Candidates must be Corporate Members of the Town Planning Institute and preferably also of an allied professional body and/or be Graduates of a British University. Commencing salary according to qualifications and experience. Car allowance for use of own car. Separation allowance and assistance with removal expenses in approved cases.

Applications, stating age, education, qualifications and experience, together with a copy of one testimonial and names and addresses of two referees, should reach the Clerk of the County Council, The Castle, Winchester, by 15th January, 1962. S1630

SURREY COUNTY COUNCIL

Applications invited for the appointment of ASSISTANT ARCHITECTS Grade V (£1,310—£1,480 p.a. plus £45 p.a. London Allowance). Must be A.R.I.B.A. and capable of leading small team dealing with medium and large scale contracts.

Applications stating age, qualifications, education and experience, present salary and three copy testimonials, preferably one from present employer, to County Architect, County Hall, Kingston, as soon as possible. 1573

Competition

36s. per inch; each additional line, 3s.

THE UNIVERSITY OF LIVERPOOL

OPEN COMPETITION

Architects are invited to submit designs for halls of residence for 1,100 to 1,200 students on the Carnatic site at Mossley Hill, Liverpool. The cost of the works will be approximately £1,500,000.

Assessors: Sir James Mountford, M.A., D.Litt., D.C.L., LL.D. (Vice-Chancellor).

Donald Gibson, C.B.E., M.A., D.C.L., F.R.I.B.A., M.T.P.I.

Professor Myles Wright, M.A., F.R.I.B.A., M.T.P.I.

Premiums: £5,000; £3,000; £1,000. Further premiums, to a total not exceeding £2,000, may be awarded at the discretion of the Assessors for other designs of merit.

Sending in Day: 4 September, 1962.

Last Day for Questions: 1 January, 1962.

Conditions may be obtained, upon payment of a deposit of £3, from The Registrar, The University of Liverpool, Liverpool, 3. Quoting Reference RVCH/518/AJ. 9547

Architectural Appointments Vacant

3s. per line; minimum 12s. Box Number, including forwarding replies, 2s. extra.

ASSISTANT ARCHITECT urgently required in busy City Office. High standard of office and residential design essential. Salary £1,750 per annum plus Luncheon Vouchers. Increments and Bonuses. Long-term engagement for right man. Box S1488.

SENIOR ASSISTANTS required for work on large hospital programme, excellent opportunities for the right men. Salary £1,000—£1,400. Luncheon vouchers and five-day week. Write giving full particulars: Watkins Gray & Partners, 57, Catherine Place, S.W.1. TC9590

£950-£1,500. ARCHITECTURAL ASSISTANTS with imagination and designing ability required to assist with large and important new developments in the central London Area. Telephone or write: Trehearne & Norman, Preston & Partners, 83, Kingsway, W.C.2. HOLborn 4071. TC9796

ARCHITECTURAL ASSISTANTS of all grades, particularly Intermediate standard, required on varied and interesting projects. High salaries will be paid in accordance with skill or experience of applicant. Lewis Solomon, Kaye & Partners. City 8811. TC5970

£1,000—£2,000 p.a. will be paid to experienced competent ARCHITECTS by a private practice in the City of London. The work will be primarily on the drawing board on new and interesting projects of magnitude. A high standard of design and detailing ability is required. Please apply in writing to Box TC9360.

INTERMEDIATE TO FINAL ASSISTANTS required immediately. Salary from £1,000 onwards and luncheon vouchers. Theo. H. Birks, 38, Portland Place, London, W.1. LAN 7236. TC8906

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