

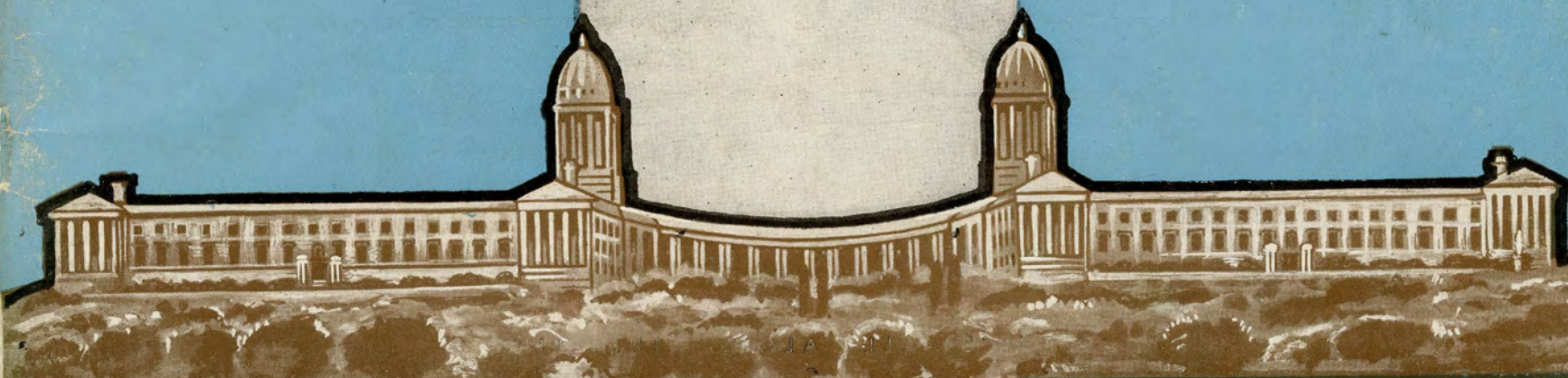
Vol. X.

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OCTOBER : 1949.

# PUBLIC WORKS OF SOUTH AFRICA

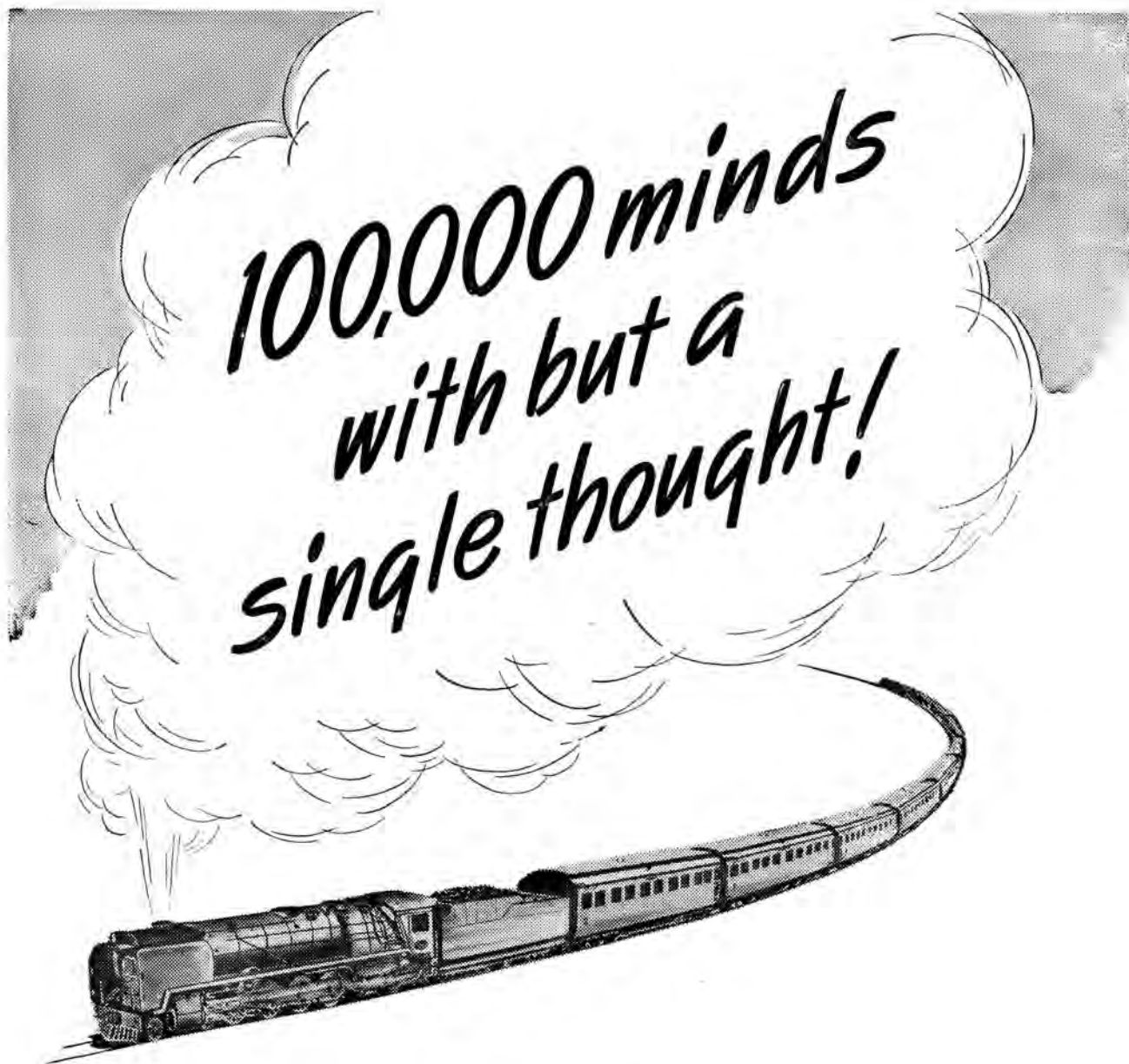
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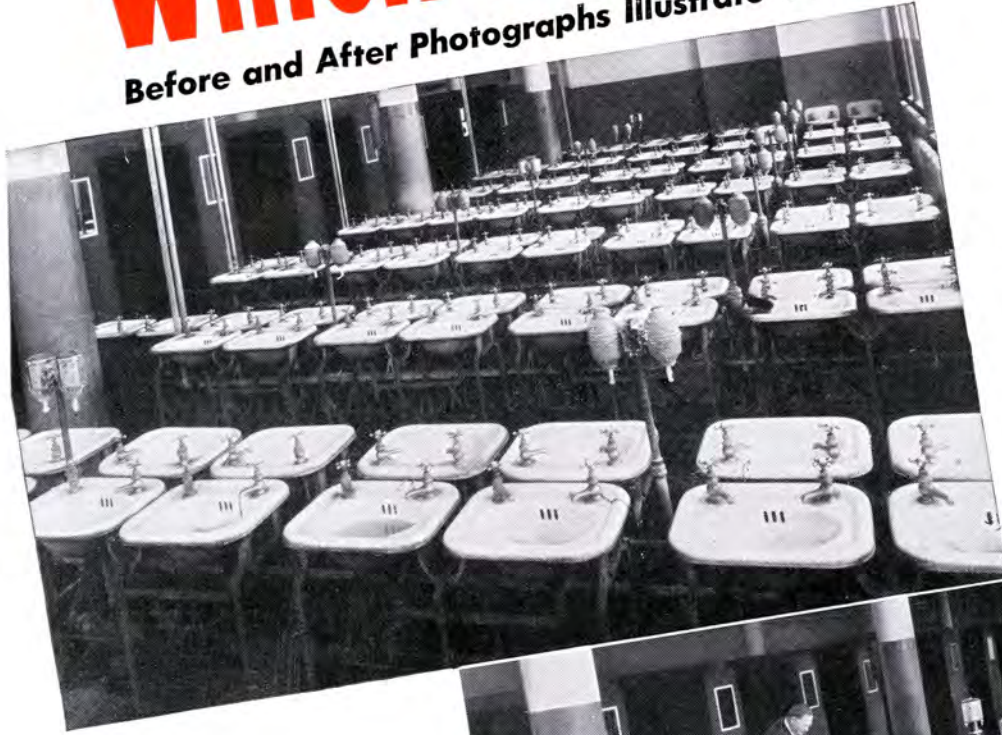


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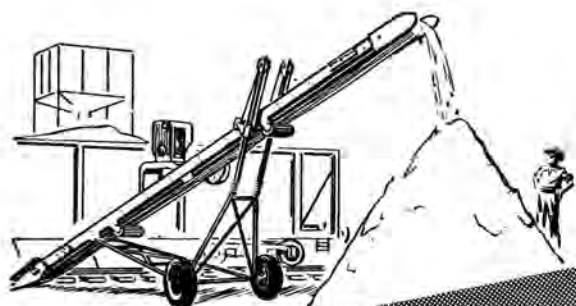


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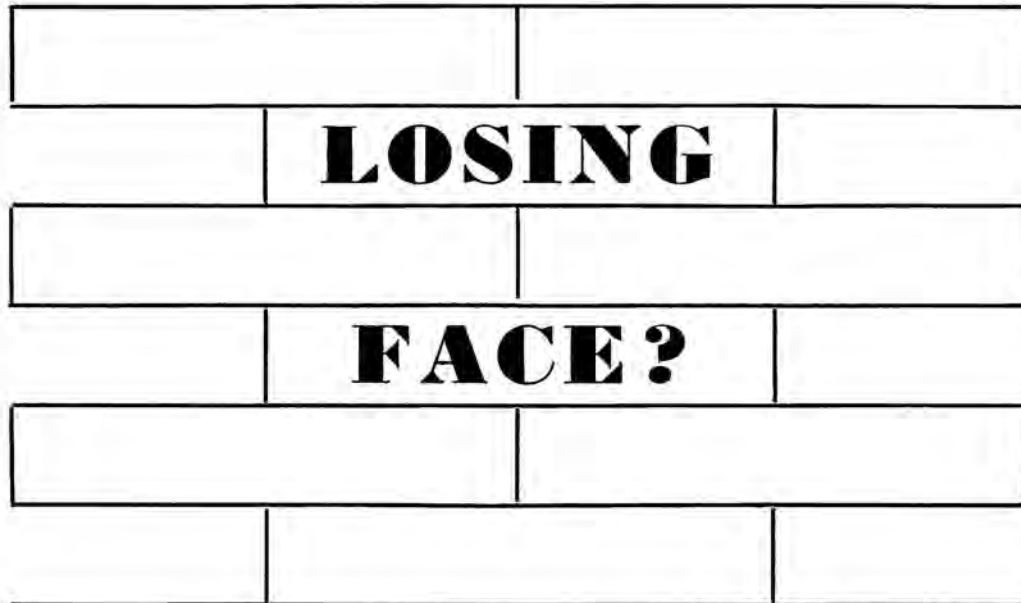
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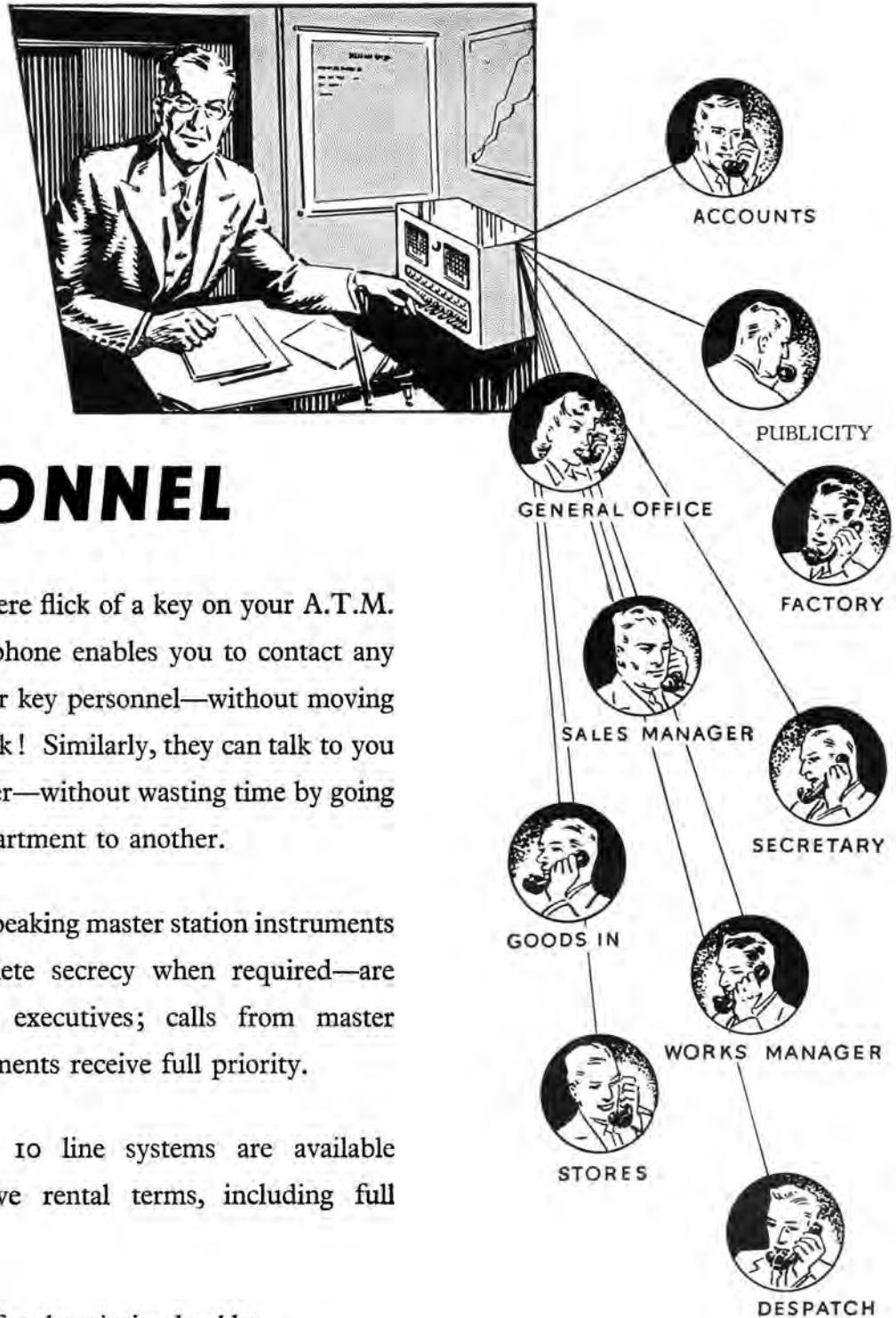
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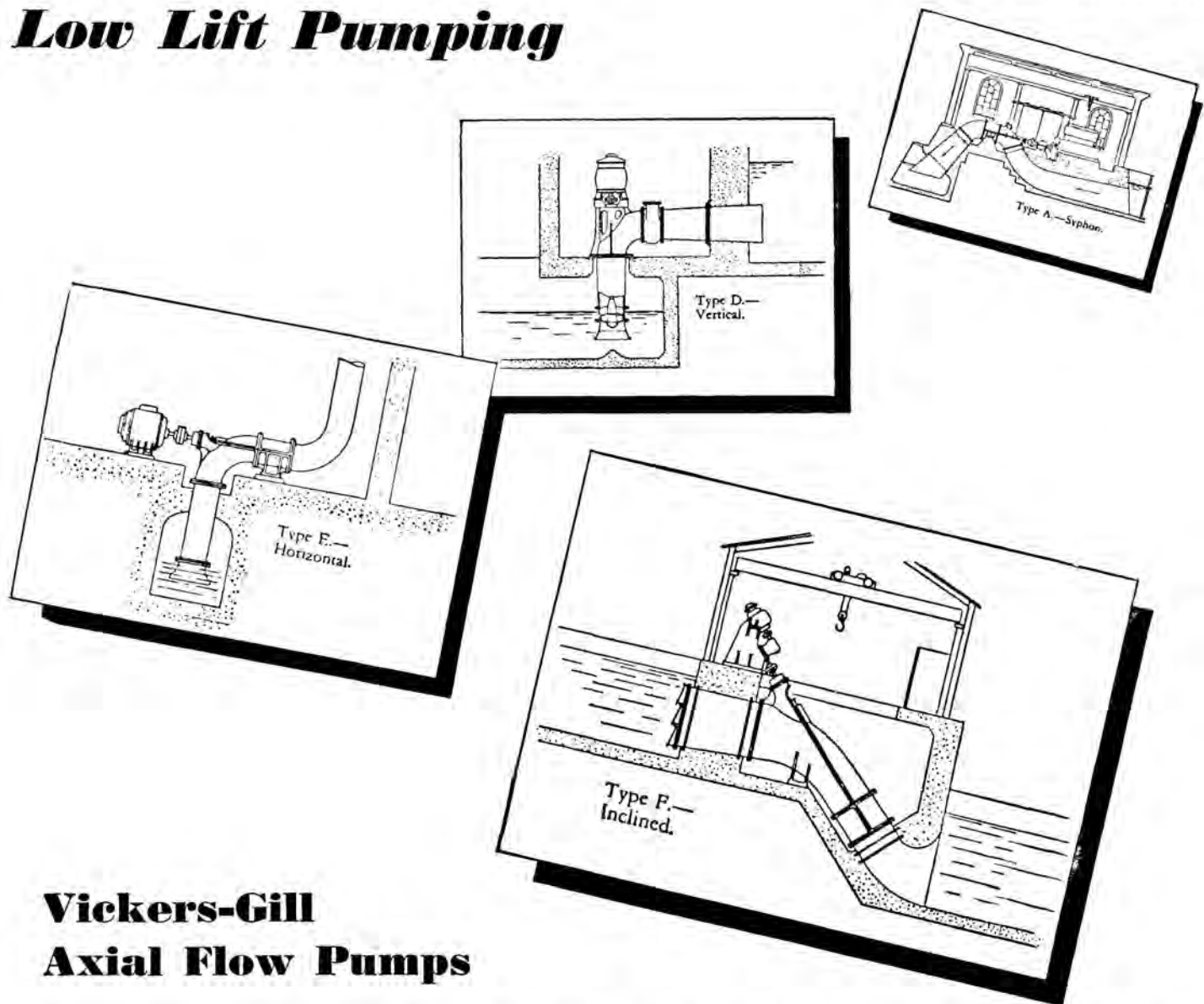
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*Page 7.*

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The Monobloc economises on floor space and facilitates erection in any position, with the minimum of time, labour and expense.

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are available

EX-UNION STOCKS

in sizes ranging from

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with capacities of

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For heads up to 300 feet.

*Manufactured in Great Britain by*

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PUBLIC WORKS OF SOUTH AFRICA, which is published monthly, is intended to keep the public up-to-date in regard to the engineering and building projects of the Central Government, the Provincial and Municipal Governments of Southern Africa and activities overseas.

VOLUME X • NUMBER SEVENTY-ONE • OCTOBER 1949

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# GLEN AGRICULTURAL COLLEGE

## WATER SUPPLY

**T**HE Glen Agricultural College lies on the banks of the Modder River, some 15 miles north of Bloemfontein.

For a number of years the domestic water supply to the College has been pumped from two boreholes situated within 50 feet of each other which were used alternately in order to conserve and rest their respective yields, a very necessary consideration when boreholes are being pumped to full capacity.

The water from these boreholes, which, at best, were pumped at the rate of 2,400 gallons per hour, was delivered to two linked service reservoirs, from whence, after chlorination, it was fed through the reticulation system to the various buildings.

### New Scheme Necessary

The boreholes are situated some 100 yards from a dam which is fed by water pumped from a weir on the Modder River. It became obvious that the boreholes receive most of their water through seepage from the dam, a rather wasteful method, and, in view of the fact that the supply was becoming quite inadequate for the needs of the College, it was decided to embark upon a scheme which would provide a supply of 100,000 gallons of pure water per day.

The possibility of augmenting the existing supply by sinking further boreholes was explored, but this idea was abandoned on the advice of the Department of Geological Survey and Irrigation Department.

### Alternative Plans

Two other alternatives were then considered, namely, to draw water from the Bloemfontein Municipality's water purification works at Mazelspoort, or to continue pumping from the Modder River, and, at the same time, to provide full scale treatment for the water.

The former scheme involved the laying of some nine and a half miles of 4-inch g.m.s. piping at an estimated cost of £17,500. Owing to the difficulty of obtaining long lengths of piping together with the attendant fittings at this time and also for technical reasons, such as friction losses, etc., this scheme was abandoned in favour of pumping from the river.

The scheme for purifying the river water at the College comprised a purification plant embodying settlement, chemical treatment, filtration and sterilisation; it also meant the provision of a pumping main some 4,500 feet in length, and the necessary purification plant to the service reservoirs.

In addition to the Purification Works, it was considered necessary to construct a new 250,000 gallon reservoir, giving



*Entrance to the sedimentation tanks from the mixing channel.*

a total storage of 350,000 gallons in conjunction with the existing reservoirs. This represents  $3\frac{1}{2}$  days storage at the maximum consumption rate to allow for possible breakdowns.

### Savings Effectuated

The final cost of the scheme is not yet available but it is estimated that a saving of approximately £3,000 has been effected by pumping the water from the river, as against taking water from the Bloemfontein Municipality's water scheme at Mazelspoort. By purifying the river water at the College a saving of approximately 2/- per thousand gallons of water treated could also be effected.

### Purification Process

The Purification Works, which are expected to be in operation in the near future, were accordingly designed on the following basis: Raw water is pumped from the river to an open dam, whence it will be lifted by a centrifugal pump directly coupled to an electric motor. The water is treated at the Works with lime and aluminium sulphate and the chemical feeders employed for this purpose are of the dry dispensing and solution feed type, respectively.

The channel, along which the chemically dosed water passes to the settlement tanks, is provided with semi-pyramidal shaped baffles staggered at 4 ft. intervals halfway along its length, the object being to induce a spiral or cork-

screw effect to the flow, for improved mixing and floc formation.

Entry of water to the sedimentation tanks will be controlled by means of Adams Hydraulics rectangular penstocks and the water will pass into the tanks through a series of holes in the floor of a launder. The hopper bottomed sedimentation tanks are two in number, each having five hoppers. Slotted timber baffles are situated between the first and second hoppers and between the fourth and fifth hoppers. These baffles extend from the top of the hopper to 6 inches above the top water line in each case; in addition, a timber baffle has been provided 1 ft. 2 ins. from the outlet, and extending to 2 ft. 2 ins. below the water line.

Sludge is withdrawn from each hopper in turn, and flows by way of a centrally situated pipe to the drying area. The clarified water will flow through a 9 ins. pipe to two rapid sand filters. These have a total area of 200 sq. ft. of filtering media, which is graded and made up as follows:—

- 4 ins. of gravel, 3/4" to 1/2"
- 4 ins. of gravel, 1/2" to 1/4"
- 4 ins. of gravel, 1/4" to 1/10"
- 1 ft. 9ins. sand, 1/10" to 1/20"
- 8 ins. of sand 1/20" to 1/30"



*The mixing channel from the dosing house to the sedimentation tanks.*

#### **Piping and Pumping**

Asbestos cement pipes are provided at the bottom of the filters for air agitation of the filter bed and these pipes are fitted with patent air diffuser nozzles at 6 ins. centres; air is supplied by a Broom and Wade rotary blower compressor delivering 100 cubic feet of air per minute at a pressure of 5 lbs. per square inch.

Backwashing is carried out by means of a Pulsometer pump direct coupled to a 15 h.p. motor and delivering 640 gallons of water per minute against a total head of 49 ft.

The filtered water passes by way of a tiled channel to a clearwater reservoir of 10,000 gallons capacity and sterilization is carried out by means of a calcium hypochlorite solution dosing apparatus.

From the clearwater reservoir, the water is pumped to



*Interior of the sedimentation tank without the baffles in position.*

the 350,000 gallon reservoirs by means of a Worthington Simpson pump direct coupled to a 25 h.p. motor running at 2,900 r.p.m. This pump has a capacity of 250 gallons per minute against a total head of 180 feet.

All pumps are of the splitcasing type and the pump-houses, etc., are of face-brick construction, with concrete slab roofs. (See accompanying illustrations).

The new 250,000 gallon reservoir is introduced with the existing two reservoirs and a system of valves is provided in order to ensure flexibility and to permit of one section of the scheme being cut off, if necessary, to allow of repairs being carried out.



*Inside of the sedimentation tank with the wooden baffles in position.*

# HOUSING SCHEME FOR NATIVES

## KLIPSPRUIT, JOHANNESBURG

**I**N view of the serious post-war shortage of suitable accommodation for the Native Population, the Municipality of Johannesburg purchased the Farm Klipspruit 49 for development as a Native Township.

The question of an economical and speedy means of construction for the necessary dwellings was then considered. After lengthy negotiations and consideration of various types of construction it was decided to place the first contract for 1,700 blocks of houses comprising 5,100 dwellings with Messrs. Laing and Roberts (Pty.), Limited, this being the largest single housing contract yet undertaken in the Union. This patented type of construction known as "ROBCONCO" had already been thoroughly tested on a smaller contract for 578 dwellings on the Orlando Township.

### Uninterrupted Flow Essential

A production programme had now to be prepared, based on an output of four blocks daily (12 dwellings) or 20 blocks (60 dwellings) weekly. This involved the layout and equipping of four separate production lines, together with the organisation for a flow of materials to permit an uninterrupted flow of work. The weekly basic material requirements to be allowed for were as follows:—

Stone .....	950 yards cube.
Sand .....	480 yards cube.
Cement .....	5,920 pockets.
Reinforcing Steel .....	26 tons.
Steel Windows .....	160 number.
Doors .....	160 number.

An important point that had to be considered was that this rate of material deliveries had to be maintained for the considerable period of approximately two years.

As in all types of work based on mass production lines the necessary tooling was an important factor and had to be arranged without delay. Eventually the preliminary arrangements were completed and production work commenced.

### Simplified Construction

In order to keep costs to a minimum the system of construction had been designed to eliminate, so far as possible, the use of skilled labour. Each operation had been simplified to be within the scope of the capabilities of unskilled native labourers, Europeans only being employed in a supervisory capacity, and on definite tradesmen's work.

The basic principle of construction is the application of no-fines concrete, in situ, to floors and pre-cast for wall panels. The reasons for the adoption of this material were:—

- (1) *Insulating properties.*
- (2) *By the elimination of capillary attraction, damp penetration is overcome.*
- (3) *The availability of suitable aggregates locally in any part of the Union.*



Photo No. 1. Foundations and underbuilding complete.

(4) *The bulk of work in concrete production and placing is definitely an unskilled operation.*

To describe the method of construction in detail the various operations are set out below.

### Foundations

The foundations are excavated in the normal manner with the exception that the bottom of trench is to the general site slope, thus stepping and levelling is omitted. 1 : 3 : 6 concrete to a depth of 6" forms the foundations for underbuilding.

### Underbuilding

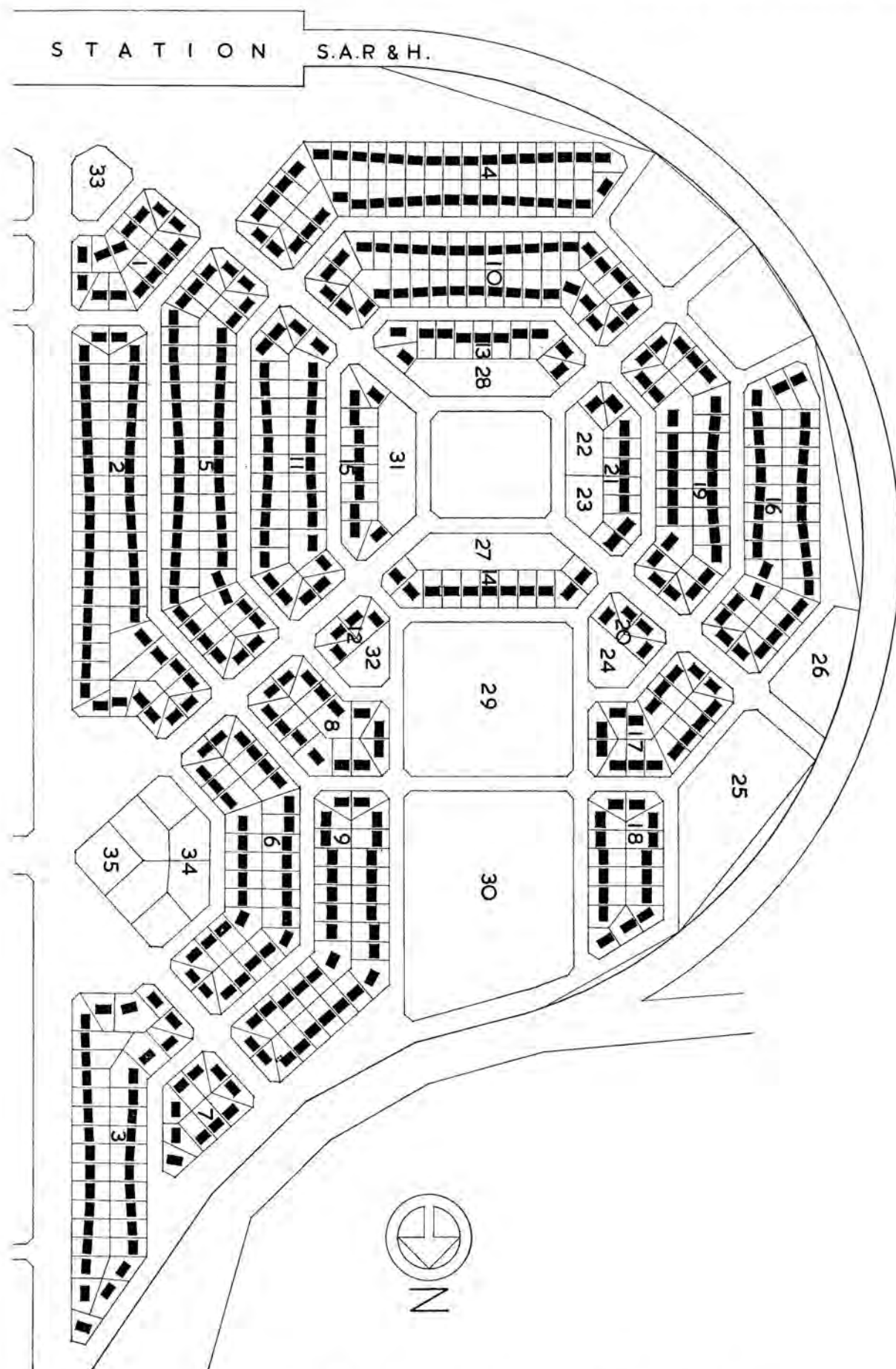
A special pressed steel shutter in two sections supported on adjustable legs is erected and levelled up by means of jacks, readings being taken by dumpy level until the top of the kerb is dead level. The intervening variable space between the bottom of this 6" deep shutter and the top surface of foundation concrete is filled with timber formwork. 1 : 3 : 6 concrete is now filled to the formwork and levelled off to the top of shutter. All shuttering is formed with a taper, to allow stripping to be carried out without disassembling the shutter units (see Photo No. 1).

### Floor

Filling is placed and rammed in layers, being brought up level with the top of the underbuilding. An angle iron shutter is now fixed with a vertical face lining to the inside of the underbuilding wall and positioned with clamps and thumb-screws. A no-fines concrete mix, 1 : 9, is spread and tamped to 3" thickness and finished with  $\frac{1}{2}$ "- $\frac{3}{4}$ " cement mortar 1 : 4. The floor slab is then tamped down and finished smooth



Photo No. 2. Floor slab cast.



Typical layout of Native housing for the Johannesburg Municipality.



Photo No. 3. Wall panel cast in layers, ready for erection.

from a canvas strip. The rebate formed by the top of the wall and the side of the floor takes the external wall panels.

#### Wall Panels

The main principle of the wall panel casting is the use of edge shutters only, the concrete floor forming the base for the first layer of slabs. Special shuttering is provided for forming door openings with rebates and casting in steel windows. All special fittings for lifting devices, slots for locating brackets, air vents, etc., are allowed for on the steel angle shutters. The series of operations of casting the 6" external and 4" internal wall panels are as follows:—

- (1) The angle steel edge shutters are placed in position, checked for square and bolted together. All surfaces are then bricked over for receiving concrete with soluble mould oil.
- (2) All door and window shutters, lifting devices, airbricks, curtain brackets fixing plates, etc., are carefully placed in position.
- (3) A  $\frac{1}{2}$ " to  $\frac{3}{4}$ " thickness of cement mortar is laid over the whole of the area between the steel angle edge shutters and flounced up with mortar to all exposed edges viz. window and door reveals, etc. The vertical and horizontal steel rod reinforcement is then placed in position in mortar.
- (4) The edge shutters are filled up to the top with no-fines concrete, tamped level and rammed down to  $\frac{1}{2}$ " to  $\frac{3}{4}$ " below top of the shutter.
- (5) The slab is finished to the top edge of the shutter with cement mortar, tamped level and surface finished with canvas strip.

On completion of this process, we have a series of slabs in layers, each faced both sides with cement mortar and have no-fines concrete between (see Photo No. 3).

#### Erection

A special gantry, running on rails, has been designed for the erection of wall panels. This gantry spans the building to be erected and, by means of a winch and gearing the slabs are lifted to a vertical position and carried to their place on the floor slab. When erected, the wall panels are retained by special angle clamps, secured in slots, on top of the walls.



Photo No. 4. Wall panels being erected by special gantry.

Space is allowed at all wall intersections for cast in situ concrete columns, to which the panels are tied by reinforcement left protruding (see Photo No. 4).

#### Completion

After erection the roof is fixed, which at Klipspruit consists of a reinforced concrete shell cast in situ on specially



Photo No. 5. Block of completed houses with concrete slab roof.

#### LEGEND

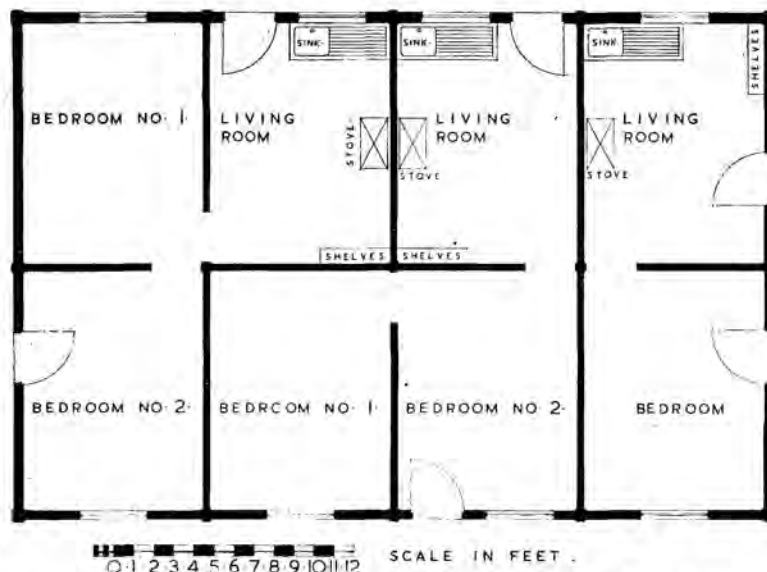
- |                             |                             |                     |
|-----------------------------|-----------------------------|---------------------|
| 1. 14 blocks of dwellings.  | 13. 11 blocks of dwellings. | 24. Flats.          |
| 2. 46 blocks of dwellings.  | 14. 11 blocks of dwellings. | 25. Reserve.        |
| 3. 34 blocks of dwellings.  | 15. 10 blocks of dwellings. | 26. Reserve.        |
| 4. 40 blocks of dwellings.  | 16. 31 blocks of dwellings. | 27. Reserve.        |
| 5. 46 blocks of dwellings.  | 17. 16 blocks of dwellings. | 28. Reserve.        |
| 6. 32 blocks of dwellings.  | 18. 16 blocks of dwellings. | 29. Schools.        |
| 7. 10 blocks of dwellings.  | 19. 28 blocks of dwellings. | 30. Playing Fields. |
| 8. 14 blocks of dwellings.  | 19. 28 blocks of dwellings. | 31. Shops.          |
| 9. 32 blocks of dwellings.  | 20. 4 blocks of dwellings.  | 32. Flats.          |
| 10. 36 blocks of dwellings. | 21. 9 blocks of dwellings.  | 33. Boarding House. |
| 11. 30 blocks of dwellings. | 22. Clinic.                 | 34. Boarding House. |
| 12. 4 blocks of dwellings.  | 23. Sub Office,             | 35. Church.         |

designed steel shutters, which collapse internally. The walls require no further treatment except brushing down to remove any neutralised cement before applying the limewash decoration. The only finishings required before occupation are:—

- (1) The hanging of external doors in concrete rebate, the hinges being welded to plates previously cast in the reveals.
- (2) Limewash treatment to walls internally and externally, as well as painting to doors and windows.
- (3) The glazing of windows.
- (4) The fixing of sinks, and pre-cast concrete food cupboards and shelves.



Photo No. 6. Block of completed houses with cast in-situ concrete shell roof.



Typical layout of three semi-detached Native dwellings in one block.

This most interesting type of construction has proved its efficiency both from soundness of construction and from its speed of erection. By the employment of Native Labour to its utmost, costs have been considerably lowered, and the output has virtually no limit.

**BILL FOR TRAINING NATIVE BUILDERS**

This bill, which will, presumably, be introduced at the next session of Parliament, beginning next January, provides for "the training and registration of native building workers, for the registration of their employment, and for other incidental matters." One of the main provisions of the bill is the establishment of a Native Building Workers' Advisory Board. The powers, duties and functions of this board are to make recommendations to the Minister in regard to the training of learners as native building workers, the making of determinations in respect of their conditions of employment, the restriction of employment of natives on any specified class of skilled work within any area (to be specified by proclamation), where a wage regulating measure applies, and any other matter referred to the Board by the Minister.

In section 10 it is laid down how the native learner is to be trained. The period of instruction shall not exceed four years and may consist of training in an institution and also in employment. Money allowances may also be paid in respect of travelling to the first employer's place of work, for buying tools and, later, to travel to where the man is going to be employed as a Native building worker.

A number of clauses of the bill relate to such cognate matters as registration of learners and native building workers, control and conditions of employment, restriction of employment in certain areas, the appointment of inspectors, exemptions, penalties for infringement of the Act, when it has been passed, and the records to be kept by employers.

The Bill is published under an Extraordinary Government Gazette, issued by the Department of Labour, No. 4234, dated 16th September, 1949.

**SOUTH AFRICAN SOFTWOODS**

The September issue of the "South African Standards Bulletin" contains an article on this subject. It points out that now, thanks to the specifications prepared by the Standards Bureau, South African softwoods timber, bearing the quality grade marks of the Standards Council, can be relied upon to conform to known standards of performance. This timber will, in fact, challenge comparison with the article imported from overseas.

In the several standard codes already issued on this subject, the moisture in graded timber is definitely described. Defects such as wane, slope of grain, discoloration, splits, checks and warp are also limited. The article goes on to stress that, in our timber-starved world of to-day, it is a serious offence to use a grade higher than that necessary for the purpose in view. It also points out that recent research at the Forest Products Institute has not supported the view that fast grown timber is necessarily weak. Furthermore, all graded South African timbers can be easily chemically impregnated and protected against termites, decay and wood borer, according to codes laid down by the Standards Council for the application of wood preservatives.

To overcome the possibility of being sold the wrong species of timber, the Council has published a nomenclature of all the most important commercial timbers produced and used in the Union. This was reviewed in our March issue. Yet another specification deals with seasoned timber for parquet blocks and joinery.



## OVERSEAS NOTES AND NEWS

**T**HE August number of the "Architectural Forum" has an extremely interesting article dealing with the construction of a new combined office building and bus terminal in Chicago. Space limitations prevent its full reproduction here. But the main details are given below.

The entire bus terminal has been put underground. By so doing the street level can be redeveloped at a rental exceeding that earned previously by as much as 20,000 dollars annually. A tunnel will give the bus terminal access to the street, two blocks away, while, at an intermediate level, there will be ample space for waiting rooms, ticket offices and various concessions. Above ground there is to be a 20-storey glass and stainless steel building, together with stores, restaurants, garage and a private park with trees.

Some interesting innovations have also been introduced into the design. These include two levels of weather-protected parking space, delivery entrances to the stores through the ceilings, windows washed with a mechanical squeegee on an exterior monorail, cantilevered floors supported by channels instead of I-beams, a new way to pack pipes and ducts close to columns, prefabricated curtain wall sections, sprayed vermiculite fire-proofing and a new record for light-weight skyscraper design.

### AUSTRALIA

#### £600 Million Public Works to Counter Slump

Broadcasting from Canberra, Mr. Chifley, Prime Minister of Australia, has said that the Government has a £600 million plan for public works ready to make jobs if at any time depression and unemployment again hits Australia. The plan provides for the building of schools, railways, and power stations.

If investment by private enterprise fell off, public enterprise would step in to fill the gap and maintain employment and income, said Mr. Chifley. In the past, when investors cut down plans and men were thrown out of work, the public authorities, "acting on confused ideas about economy and so-called sound finance," had usually cut down their works, too.

The proposed works were projects which would add to the strength and efficiency of Australia's economic machine.

*Highways, Bridges and Aerodromes.*

### BRITAIN

#### Skyscrapers Not Wanted

Manchester Corporation's plans to keep the city's skyline at a comparatively low level, are undisturbed by a decision of the Minister of Town and Country Planning not to permit the building of what would have been the local equivalent of an American skyscraper.

The building, 380 ft. high, a thirty-five storey proposed office block, had been planned by a Manchester architect, Mr. Joseph Sunlight. It was to be built next to his fourteen-storey

office block, Sunlight House, in Quay Street, Manchester.

When the plans came before the Town Planning Committee, in the autumn of last year, they were rejected on the grounds that the building would dominate the area in which it was to be built.

*Municipal Engineering.*

### PREVENTING SILICOSIS

#### Exhaust Glove to Stop Dust Inhalation by Stonemasons

The principal employers' associations of the stonemasons' and quarrying industries have recently received a personal letter from the Chief Inspector of Factories, warning them of the high incidence of silicosis among masons, and explaining some of the precautions which can be taken against the disease.

The Ministry of Labour has found that during the eight years, 1940-1947, 560 men who worked on sandstone are known to have died from silicosis, or silicosis accompanied by tuberculosis; of these, 377 were sandstone masons. As stated in the leaflet, which employers have received with the letter: "These figures give cause for much concern and point to the need for a drive to modernise and extend their preventive measures in the light of modern standards."

As there is no known cure for silicosis — a disease of the lungs brought about by inhaling sharp particles of silica dust — the Ministry is particularly concerned that all possible measures should be adopted throughout the industry, particularly in the laying of dust. They have, therefore, recommended the following precautions:—

- (i) Working wet wherever possible is a great aid in suppressing dust, although water sprays will not trap all the finer particles of dust.
- (ii) Exhaust draught should be provided to control the dust given off at the tools of lathes and planing machines when working siliceous stone dry. Pneumatic chisels should have a compressed air operated injector suction applied to carry away dust created at the chisel point.
- (iii) Well-applied general ventilation may be of great importance in reducing the amount of dust breathed by stonemasons. As far as weather conditions permit this work should be carried out in the open yard. The workers should be instructed to take advantage of any wind by standing sideways to the direction of the wind, the work being placed on a suitable turn-table to facilitate an easy change of standing position. Obstruction to the wind should be as little as possible so as to allow it to take full effect.
- (iv) Where possible, the work of several banker masons should be so arranged in the yard or shed that the dust created can be dealt with by a suitably designed exhaust system. Where this is not possible, provision

for each mason of a separate movable exhaust hood, connected by a flexible pipe fixed to exhaust ducting, should be considered. The stone being dressed may be placed on a turn-table to enable the dust created to be directed as far as possible into the exhaust hood. Where this method of working is adopted, masons should work as far apart from one another as possible.

- (v) For some stone dressing operations done with hand tools, a rubber glove for the left hand, incorporating an exhaust nozzle operated by a compressed air injector can be worn.
- (vi) Dust drawn away from a workroom by exhaust systems should not be blown straight out into the atmosphere but should be collected in a dust collecting apparatus outside the workroom.
- (vii) Masons should be provided with and encouraged to wear an efficient respirator at all times when dust is being created by themselves or their neighbours. It is particularly important that respirators should be worn during the operations of punching or roughing.
- (viii) Before brushing off accumulated dust and fragments of stone from the work the debris should first be wet.
- (ix) Attention should be given to maintaining a high standard of general cleanliness in the yard, accumulations of stone debris and dust should be swept up and removed regularly after first being wetted to prevent the stone dust being blown about.

Finally, the Chief Inspector points out that success in the use of these preventive measures will be in proportion to the employers' enthusiasm, together with the workers' knowledge and co-operation. The education of all workers, particularly the younger ones, is essential. To attain this, it is suggested that: "... a positive drive by employers by means of lectures and discussions offers the best chance of success."

*Fire Protection and Accident Prevention Review.*

## SWITZERLAND

### Admissible Stresses in Metal Structures

In a study prepared for the Institut Technique du Batiment et des Travaux, Paris, M. Ros, Director of the Federal Materials Testing Laboratory, Zurich, first recalls the fact that this laboratory proposed a generalisation of Mohr's theory according to which the actual stress in each case is expressed by an equivalent stress valid for both elastic and plastic strains and deformations both in the case of static strain and fatigue.

This generalised theory applies to both riveted and welded structures; this is confirmed by fatigue tests. The limit of fatigue depends on the natural properties of the materials, which in practice are almost isotropic and homogeneous; it also depends on defects and notches, which accelerate rupture through fatigue. The theory is also applicable where the material is anisotropic.

The F.M.T.L.'s method of calculating stability can be used to solve the problem of the buckling of lattice structures

(dimension of tie rods) and of resistance to buckling even for plastic deformation. By this method Euler's law can be generalised; *the module of plasticity*  $T_k$  being applied in the case of plastic deformation in place of the *module of elasticity*  $E$ , which is applicable to elastic deformation.

**Progress made in the field of metal structures in Switzerland since 1892 has brought about an increase of 40 per cent. in admissible stresses for riveted and welded solid web or lattice structures, 40 per cent. for composite beams, and 25 per cent. for pressure pipelines, boilers and pressure vessels.**

*Highways, Bridges and Aerodromes.*



*The hydrocarbon or fractionating unit of the new Stanlow chemicals plant, which will manufacture solvents previously obtained for Britain only from dollar sources*

## SOUTH AFRICAN PAINTS

Work is now proceeding, in the paints laboratory of the South African Bureau of Standards, to evolve specifications for organic finishes, suitably compounded, to provide protection from climate as experienced in this country. Already specifications have been published for white lead, white lead-in-oil, green, yellow and orange chrome pigments, as well as dehydrated castor oil. Others, dealing with raw, refined and boiled linseed oils and also zinc oxide are being prepared. Further specifications for raw materials will follow.

# ENGINEERING EXHIBITION

**ALTHOUGH** the main emphasis of the 17th Engineering and Marine Exhibition, which opened at Olympia, London, on the 25th August, quite naturally was on the Marine Equipment, there were nevertheless a great number of exhibits of interest to those engaged in other fields of engineering.

*In a brief review it is only possible to take at random a small selection of the products displayed.*

## "Zone of Quietness"

A special wall type telephone booth for use in noisy offices was shown by Burgess Products Co., Ltd.

The interior walls and ceiling of the Accousti-Booth are lined with "Accousti-Pad" Quietening Sheet, a patented combination consisting of a perforated metal facing plate backed by a sound absorbing material of high efficiency. Noises and other extraneous sounds which strike the perforated surface filter through the small holes and are blotted out by the sound absorbent lining. Thus a "zone of quietness" is created. There are no echoes, or reverberations so that conversation is easier and more rapid.

## Rural Distribution Transformer

In addition to a wide range of electrical resistances and transformers for industrial, scientific and radio equipment built up during a period of over twenty years in this field, The British Electric Resistance Co. displayed their stoneware tank pole-mounted rural distribution transformer, more than 1,500 of which have been manufactured during the last two years — and 80 per cent. for export.

The transformer is hermetically sealed in the stoneware container, thus obviating the tendency to acid formation or corrosion of the tank. It is, therefore, specially recommended in conditions of humidity or where corrosion-laden fumes may attack the conventional steel tank.

As a further step in the policy of standardization, a new 25 kVA circular steel tank pole mounting transformer has been introduced. This combines the lowest initial cost and reduced operating costs through its specially treated tanks to resist weather and corrosion.

## "Lily" and "Swiss Roll"

"Lily" and "Swiss Roll" exhibition by Hamilton's Lilyflex Surfaces, Ltd., were war inventions. "Lily" was a floating airstrip developed for use in the invasion of Japan. "Swiss Roll" was a ship to shore floating roadway which was used in the Normandy operations.

"Lily" is made up of individual steel floatation units, of hexagon shape, which can readily be hinged together or taken apart. It can be made to any shape or size desired, and altered or enlarged easily by adding other units. The units can successfully be used to form bridges over rivers and swamps.

"Swiss Roll" is a roadway made of wood, canvas and steel wire rope. It is an extremely light and cheap form of semi-permanent bridge, which can easily be transported to the site and unrolled in position.

## Descaling System

Clenzol, Limited, exhibited their Descaling System, which comprises a liquid preparation with an acid base, designed to dissolve industrial deposits without affecting metal. Prevention of attack on metal is effected by the action of the inhibiting chemical constituent. It is supplied in fully inhibited and concentrated form and is diluted for use with water. It may be used safely with all metals apart from aluminium, zinc and tin. This restriction does not obtain, however, when these metals are in alloy form — as in aluminium bronze, etc.

By Clenzol methods plant is descaled with minimum dismantling. It is simply necessary to isolate the unit, drain down and then introduce the solution. On completion, drain, wash out and reconnect for work, thus effecting a substantial saving in time and labour.

Restriction of sewers is generally caused by deposits of organic matter, highly soluble in Clenzol. In certain industries the main effluent sewer becomes restricted by deposition of lime. Normally, these are dealt with by fitting expanding stoppers at the up- and down-stream ends of the section to be treated. A flow of water is admitted to the section at the up-stream end and then Clenzol is simply poured into each intervening manhole in the required quantity. The flow of the water carries the solution forward through the sewer and insures an initial mixture. The liquid is "topped-up" or strengthened at intervening manholes during treatment. In the case of sewer pipes with cement joints, only a very mild concentration is permissible, owing to the necessity for avoiding attack on cement in the joints. Submerged mains call, generally, for the services of a diver to go down and fit an expanding stopper, with hose attached, at the outer end of the pipe.

## Floor Cleaning

Of special interest to those responsible for floor cleanliness was the Dixon and "Columbus" Electric Floor Maintenance Equipment made by R. G. Dixon & Co., Ltd. The scrubber is designed for use in factories, hospitals or institutions, special interchangeable brushes being available for any type of floor. Used in conjunction with the scrubber, the squeegee absorbs dirty water after scrubbing. The floor polisher will clean, wax and polish any type of floor. The carpet shampooing machine is designed for commercial or industrial carpet cleaning "in situ". The combined "Columbus" machine is speedily convertible from a suction floor polisher to a vacuum cleaner by a simple change of base. The floor polish sprayer applies electrically heated wax or polish to large floors quickly and economically.

### Synthetic Rubber Adhesive

A fairly new addition to the range of adhesives, manufactured by Surridge's Patents Ltd., is "Titebond." This is based on a synthetic rubber specially treated and compounded to give outstanding adhesive qualities. "Titebond" sticks fabric to wood, metal to paper and metal to metal and phenolic materials may be joined so that the shear strength of the bond is in the region of 500 lbs. on one inch square overlap.

"Titebond" is a solution of medium viscosity and may be applied by brushing, spraying or spreading. Should thinning be necessary, it may be diluted by acetone, MEK, ethyl acetate, butyl acetate, MIK and other solvents.

### Lamination

A range of typical machinery components fabricated from Permali, a laminated improved wood product, vacuum impregnated and densified, was displayed by The New Insulation Co.

Properties claimed for this material are: Exceptionally high strength/weight ratio, high dielectric strength, resistance



*"Permali" round and rectangular section Lifting Rods for High Voltage Switchgear.*

to moisture and white-ants, machinability and dimensionable stability. Among typical uses for Permali components are: H.V. electrical apparatus: Insulating components highly stressed electrically and/or mechanically, e.g. circuit breaker lift rods; transformer and clamping plates; turbo-alternator and winding supports, etc. H.V. overboard transmission lines: Stay wire insulators; bird guards.

In the transportation field it can be employed for insulating railway fishplates as well as sectionalising beams for trolley-bus and railway overhead wires.

### Dial Thermometers

A comprehensive range of bi-metallic and distant reading, easily read, dial type thermometers for both industrial and domestic use was shown by The British Rototherm Co. Ltd.; also indicating and non-indicating temperature controllers, disc chart temperature recorders, a thermostatically controlled test tank, pressure gauges, barometers, etc.

In place of a column of fluid or mercury contracting or expanding with changing temperature, the Rototherm employs a multiple helix of nickel iron alloy. Under temperature changes the torsion of the helix is communicated to a pointer giving a direct rotary indication on a dial. The total temperature range that can satisfactorily be covered by this principle is from approximately 100°F., to 1050°F., or equivalent Centigrade, and a large selection of calibrations is available covering those portions of this range commonly demanded in practice.

An outstanding advantage is the fact that temperature can be read "at a glance," even from considerable distances. For low temperatures the figures are black on a white background and for high temperatures the dials are of black anodised aluminium through which the figures show in their natural colour.

Short of wilful damage or accident the Rototherm will withstand vibration, shock and other hard usage which would be inadmissible where fluid in glass thermometers are concerned.

### Diesel Engines

Exhibits of The English Electric Company, Ltd., included examples from an extensive range of Diesel engines for traction and industrial use. Among these was a three-cylinder dual-fuel engine (type KD) with an output of 165 h.p. at 600 r.p.m. The engine operates on town's gas, sewage gas or natural gas. It comprises a standard unit, in which a set of very simple equipment has been added to the cylinder heads, enabling the engine to operate either as a straight diesel, or as a dual fuel unit. The important point is that, while running, the engine can be changed over from diesel fuel to dual-fuel operation. Another important feature is that close governing is possible, both on oil and gas. The dual fuel parts are very accessible and can be easily adjusted.



**The Locomotive Testing Station of British Railways at Derby, England, is probably the most up-to-date of its kind in the world to-day. The project, conceived by the late Sir Nigel Gresley, famous Chief Engineer (Mechanical) of the London and North Eastern Railway, was started in 1939, but owing to the war could not be completed until October, 1949.**

## PUBLICATIONS RECEIVED

**Census of Industrial Establishments 1944-45.** Published by the Government Printer, Pretoria. 129 pp. 11s.

The usual comments in regard to Government statistics, unfortunately, apply again here. The facts are at least four years old and, despite extremely full and comprehensive tables covering a wide range of information, there are no charts, maps or graphs to illustrate either national or regional trends.

During the year reviewed there were 871 building or contracting industrial establishments, employing just over 9,000 Europeans and more than 25,000 non-Europeans. The gross value of their output was almost £15.9 million. The net output was valued at £8.4 million approximately, or roughly £240 per annum per person employed. As a comparison it is interesting to note that the industries classified as "metal engineering, machinery and cutlery works" produced, in the same period, a net output valued at nearly £36.8 million, with a total personnel of 104,000 and odd, of all races. Per individual this works out at approximately £354 per annum, not far short of half as much again as the individual productivity in the building and contracting industries.

**Colonial Research 1948-1949.** Published by H.M. Stationery Office. 134 pp. 2s. 6d.

Of recent years the British Government, shorn of most of its possessions in Asia, has rediscovered Africa. This Report covers the activities of a number of bodies concerned with research into the products, social science problems and medical, agricultural, forestry and economic aspects of the colonial empire including, of course, the African Continent.

Among other enquiries, that on the water resources of

Bechuanaland, N. Rhodesia, Nyasaland and East Africa has already been issued. An African Labour Efficiency Survey has also been issued. Copies will soon be available of a bibliography of published works relating to African Land Tenure. In the directions of building and housing a colonial liaison officer has been appointed to work with the D.S.I.R. at their Garston Building Research Station. As a result a paper on "Prefabrication and Colonial Building" has been issued. It discusses standards for house design in hot climates and stresses the fact that prefabricated buildings should not be regarded as a solution to the problem of colonial housing.

A first regional Institute of Social and Economic Research has been established at Makerere in Uganda.

*The following specifications have all been published by the South African Bureau of Standards, in English and Afrikaans. Price 5s., post free.*

**Specification of Fluor-Chrome-Arsenate-Phenol Type of Timber Preservative. 26 pp.**

**Specification for Zinc Chloride for Timber Preservation. 20 pp.**

**Specification for Metallic Napthenates for Timber Preservation. 28 pp.**

**Specification for Pentachlorophenol for Timber Preservation. 25 pp.**

**Specification for Acid-Cupric-Chromate for Timber Preservation. 20 pp.**

**Specification for Zinc Meta-Arsenate for Timber Preservation. 20 pp.**

*(Concluded on page 32)*

**View of the new goods shop at the Prospect Railway Yard, now approaching completion.**



Photo : S.A.R.

# ABSTRACT OF GOVERNMENT REGULATIONS

**F**OR some years past the flow of government regulations, in South Africa as in other countries, has been voluminous. It is not easy for the professional man to keep abreast of laws, ordinances and regulations which may affect him. In South Africa, too, with four provincial administrations, as well as the Union Government, all, necessarily, issuing orders of various types covering wide fields of activity, the task is particularly difficult. Accordingly, we propose, from time to time, to publish abstracts of new regulations, with references as to where they may be found and read in full by those of our readers who are especially interested.

**Arbitration Award : War Measure No. 145 of 1942 : Building Industry, Witwatersrand, Pretoria and other Areas. Extraordinary Gazette No. 4231, dated 2nd September, 1949.**

This award settles a labour dispute which might have arisen between employers and employees in the building industry in the following magisterial districts :

Johannesburg	Germiston
Benoni	Boksburg
Springs	Brakpan
Heidelberg	Nigel

and within areas of radii varying from 10 to 30 miles from the main post offices of the towns listed below.

Klerksdorp	Krugersdorp
Potchefstroom	Vereeniging
Pretoria	Middelburg
Witbank	

The award lays down basic wages, cost of living and holiday allowances, hours of work and conditions for terminating contracts of service for six classes of workers. These include unskilled labourers, stone polishers, scaffolding erectors, concrete mixers and property patrollers. The award took effect from the 5th September, 1949, and remained in force until June, 1950.

**Notice of Price Control : Maximum Prices for Developing and Printing. Extraordinary Gazette No. 4230, dated 2nd September, 1949. Notice No. 1840.**

This notice lays down the maximum prices that may be charged for making film prints from equal size negatives and for making enlargements.

**Municipality of Paarl : Amendments to the Building Regulations. Province of the Cape of Good Hope Official Gazette No. 2431, dated 9th August, 1949. P.A.N. 359/1949.**

These amendments cover fees payable to the municipality and other conditions relating to approval of building plans.

**Municipality of Klerksdorp — Drainage and Plumbing By-Laws Amendment. Administrator's Notice No. 578, dated 7th September, 1949.**

This amendment deals with means of access and the minimum size of inspecting and disconnecting chambers as well as the weight of covers for drainage and plumbing pipes.

**City of Pietermaritzburg — General By-Laws. Section 18 : Advertisement Hoardings and Signs : Amendment. Notice No. 334, 1949, Dated 15th September, 1949.**

This amendment controls the fixing and erecting of bill posters and advertisement hoardings as well as the charges to be paid in respect of balconies, verandahs or other projections over streets. Apart from the payment of rentals, the "design, arrangement and construction of verandahs, balconies and other projections over streets and roadways shall be to the satisfaction of the City Engineer."

**Municipality of Knysna : Amendment to the Building Regulations. Province of the Cape of Good Hope Official Gazette No. 2437, dated 23rd September, 1949.**

This amendment lays down the limits of a building in relation to the general line of existing buildings bordering any street. It also reserves to the local Council the right to approve the erection of verandahs, balconies, signboards and other structures of a like character. Generally speaking the frontage line of any new building may not be less than 15 feet from the street boundary, except that the Council may, in its own discretion, permit the frontage line to be nearer, so as to bring the new building into line with any existing building frontage line.

**Borough of Port Shepstone : Drainage By-Laws. Official Gazette of the Province of Natal. Gazette Extraordinary. No. 2248. Dated 27th September, 1949.**

These by-laws, which deal with drains, soil pipes, waste pipes, sanitary fittings, water closet pans, water closet chambers, plans, notices and fees, relate to the responsibility of existing owners of property in the Borough as well as the design of the items mentioned above. The by-laws, which are too long to summarise in detail here, cover thirty pages in all and should be studied by anyone advising upon or building dwellings or offices at Port Shepstone.

# BRIDGE PAINTING AND TREATMENT OF DEFECTS

## Countering Various Types of Corrosion

*While Architects and Civil Engineers may be mainly concerned with the construction of bridges and buildings, questions of maintenance often affect the solutions to their problems. Obviously choice of materials, in certain circumstances, vitally concern the permanence and maintenance cost of structures. The author of this paper describes some defects encountered and methods found successful in dealing with them.*

**M**ETHODS of tackling defects and corrosion in the course of repainting bridges under the control of Lancashire County Council were given in a recent paper prepared for the Institution of Municipal Engineers by Mr. A. S. Whitaker, of the Lancashire County Engineer's Office.

Various conditions of corrosion on steelwork require different techniques, both manual and mechanical, for their removal. The removal of paint and scale is best accomplished by an oxy-acetylene burner. It consists of various types and sizes of burners, supplied through controlling valves from cylinders of oxygen and acetylene. The burners comprise either a round flat nozzle having single apertures of varying diameters, or a flat multiple burner having a number of small diameter apertures set in line, and the rear face of the burner formed into a distance guard rather like one half of a safety razor.

Oxygen and acetylene is supplied in cylinders of approximately 200 cu. ft. After heating the steelwork, the loosened scale and paint is removed by hand scrapers and wire brushes.

Hard, thick scale and compressed mixture of soot and scale experienced on railway overbridges can only be removed completely by chipping. A65 cub. ft./min. diesel compressor was purchased to work chisels housed in light alloy hammers, and rotary wire brushes. The chisels have a cutting edge of 1½ in.-3 in., and are sharpened by carborundum grinders driven by the compressor. The compressor is trailer-mounted and towed by the bridge painting lorry.

### Normal Corrosion

Cast iron members are not normally seriously affected by corrosion, even though the surface is rough and pitted. Corrosion is greatly accelerated when the member is submerged in water, or subject to continual water seepage.

Wrought iron and steel members are attacked in patches by corrosion when the protective paint film is pierced. The corrosion is severest in the flanges at the abutments, at bearings and around struts and stiffeners.

Normal corrosion consists of thin flakes having local pockets that are deeply pitted.

The methods of treatment are :—

1. For cast iron, the scale is removed by hand or compressor chisels, because the heating effect from the

oxy-acetylene flame may cause cracking of the members. The structure is then wire-brushed and painted with the normal three-coat work.

2. For wrought iron and steel structures, the oxy-acetylene flame is most effective for removing the scale and old paint coats, followed by hand scraping and wire-brushing. Use of the compressor is resorted to only when, after a few passes of the oxy-acetylene flame, the scale is too hard to remove by hand. In either case, descaling is only carried out in patches where required, unless it is decided that the structure has too many coats of old paint.

The patches are given a coat of red lead and after setting a coat of battleship grey, then the whole structure is finished with a coat of Brunswick green gloss paint. Where a bridge has been previously painted with black bituminous paint, it is patch painted and given a final coat of that paint.

### Water Seepage

The defect may be caused through :

- (1) The absence of or a defective D.P.C. over the structure ; this is indicated by an early discoloration of the paint, followed by localised corrosion when the paint film is broken.
- (2) Periodic condensation of water on the steelwork through adjacent industrial discharges of trade effluents.
- (3) Laitence from the construction of bridges with brick or concrete having the bottom flange exposed. The salts in the laitence soon attack the paint film, and the adhesion of the stalactites concentrate their water seepage on these points of corrosion.
- (4) Steelwork in long culverts having no ventilation and which are often submerged in the water.
- (5) Steelwork on bridges of low headroom which, during rises in the water level, are submerged in the water.

Normal descaling by oxy-acetylene flame and compressor tools is carried out. Then there are three methods of treatment by painting :—

1. The steel structure is painted with the normal three-coat work. Great care is taken that the steelwork and the paint films are dry before further painting. This cannot always be ensured with bridges that have no D.P.C. or

from capillary action.

2. The structure is painted with a base coat of red lead and it is allowed time to harden. Then one or two coats of black bituminous paint are applied. In some cases, where the amenity has to be preserved, this only applies to the underside of the bridge, the outside elevations are painted with the normal three-coat work.
3. In some instances, the structure is painted with two coats of black bituminous paint.

#### **Chemical Action**

There are a few bridges that have corrosion due to the following defects :—

- (a) Fumes and deposits from adjacent chemical works. The side opposite to the prevailing wind shows the severest corrosion.
- (b) Sulphur fumes from railway engines in a long bridge constituting in effect a tunnel. The ventilation is very poor and the sulphur is deposited on the steelwork. The corrosion is aided by engine blast, and the sulphur entrapped by a 1 in. layer of highly compressed soot. The scale can be more than 1 in. thick in parts, and the majority of the rivet heads in the bottom flange eaten through.

was to use compressor tools. The corrosion was very resistant and most difficult to remove.

The bridges were then painted with the normal three-coat work.

The density due to incomplete descaling, and the painting on top of scale, are that the corrosion is stimulated and the paint film is soon destroyed in the worst areas.

Bridges that have not been maintained for a long time, show both corrosion and complete eating through of members. During descaling, care has to be taken that what does remain of the native metal is not stripped down. It is not possible in these cases to fully remove the scale, especially from pitted areas.

The bridge structure is painted with normal three-coat work.

For the future programme, a reconnaissance of the bridges painted in the first and second years after the war will be undertaken, in order to commence painting those bridges that are already showing corrosion. It is envisaged that considerably less descaling will be required, but it is intended that at least one large bridge (over 2,000 sup. yd. of steelwork requiring painting) will be completely descaled each year.

*Highways, Bridges and Aerodromes.*

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## **BUILDING COSTS**

*(Contributed)*

**F**OLLOWING the recent visit of the Administrator of the Transvaal, Dr. W. Nicol, and a number of Provincial Councillors and officials to Italy, discussion has arisen concerning the relative building costs in that country and in South Africa. As a result of suggestions that a delegation of experts proceed to Italy and examine the situation there, two meetings were recently held in Johannesburg. These meetings, which were entirely informal, were attended by representatives of the Transvaal Provincial Council; the Johannesburg Municipality; organisations connected with the architectural and engineering professions; the Johannesburg Chambers of Industry and Commerce; the National Development Foundation and the Building Trade.

#### **International Comparisons**

At these meetings the well-known facts in regard to the high building costs, experienced in South Africa, were freely ventilated. As is common knowledge this question has caused grave concern to all informed persons, both within and without the building industry, for some time. At the outset the point was urged that, in Italy, buildings appeared to be soundly constructed, well finished and designed, embodying at the same time, new materials and advanced methods. The cost of erection also seemed to be much less than commonly experienced in South Africa.

It was pointed out that building formed only a portion of the national economy, that the factors affecting costs in building affected all other economic activities as well and that these would have to be tackled as a whole, before any rational solution of the building cost problem alone could be found. Conditions obtaining in Italy, it was stressed, were so different to those in South Africa that it was doubtful whether any direct contribution towards the desired reduction of building costs in the Union could be made by further visits to Italy. That country has an economy, profoundly affected by a series of financial reforms resulting in deflation and unemployment a few years ago. South Africa, on the other hand, normally has an expanding economy in which it is inevitable that labour and materials are continually in a state of comparative short supply. In point of fact, visitors to Italy, desirous of observing reduced building costs, would actually see, not the reduction of building costs as such, but rather the overall effects of an economy in which the average level of productivity is higher than that obtaining in the Union.

#### **Many to Blame ?**

It was suggested that public and all building owners of every race must adjust their standards of accommodation and construct in accordance with not only their own but also the economic position of the country itself. At the present time



there is a noticeable tendency for individuals to build above their own and the country's means.

Blame was attached in turn to the building owner for consenting to pay inflated prices for dwellings; to the architect for inefficient design, wasteful methods and the use of obsolete materials; to the building regulations for insisting upon out-of-date requirements; to the builders for insufficient rationalisation and neglect of prefabrication; and to the engineers for not utilising pre-stressing and light-weight materials for construction. These were only a few of the points raised in an exceedingly frank discussion.

#### National Conference Proposed

The outcome of the two meetings was the proposal that a Union-wide conference should be convened shortly by the National Development Foundation of South Africa, as a co-ordinating body. At that conference, which it is hoped will be a five-day affair, it is intended that every organisation, which is interested in this problem, shall be adequately represented and able to put forward its own point of view.

Among the subjects which, it is expected, will be discussed, are the design, materials and methods of construction; legis-

lation as it affects building requirements, methods and productivity, as well as economic and financial considerations which concern the industry. But it is requested that, before getting down to a detailed study of the building problem *per se*, it would be desirable to analyse the complete cost structure of the Union, insofar as it affects the construction of dwellings. Lastly, since labour enters so largely into every process of building, it is hoped that representatives from the Labour Movement may be able to make an effective contribution towards the deliberations of the conference.

While it must be obvious that such a thorough-going overhaul of the causes of high building costs will, of itself, be valuable, much time and effort will be wasted unless tangible results accrue from the findings of those who attend. In the past far too many investigations have taken place and valuable recommendations have been made, only to find their way into pigeon-holes whence little has been heard of them later. In this instance, where private enterprise is taking the initiative, it is to be hoped that appropriate, beneficial, definite and swift action by the Government, by local authorities and by professional and industrial interests may follow. Only in this way can the building costs problem really be solved.

## LIBRARY ACCESSIONS

C.S.I.R. Information, in its present form, is a list of accessions to the Library and Information Division of the South African Council for Scientific and Industrial Research. Many of the publications listed were received from the Union's Scientific Liaison Offices in London and Washington.

The arrangements of the accessions list is alphabetical under subject headings. As far as practicable these headings have been kept uniform with those used in the **Industrial Arts Index**, a publication familiar to most searchers for technical information. The classification numbers follow the Universal Decimal Classification. Short annotations or abstracts have been added when the titles are not self-explanatory. Certain documents have already been handed on to institutions which have built up collections covering highly specialised fields. In such cases the name of the institution is given in this list, as the document in question is located there. Applications to borrow such items should be sent direct to the institute named, not to the C.S.I.R. Library.

Publications not in constant use by the departments of the C.S.I.R. may be borrowed through the post. **Enquirers should note the number at the left-hand side of each item (e.g., 35/21)** and address their letters to: Library and Information Division, South African Council for Scientific and Industrial Research, P.O. Box 395, Pretoria. Telephone: 3-1261 (Ext. 42).

Documents should be returned to the Library by **registered post, packed flat.**

#### BUILDINGS. Alterations.

- 36/20 SNELL, Ronald G.  
Alterations to buildings . . . London, Sir Isaac Pitman and Sons, Ltd., 1948.  
v, 105 p. tables, diagrs. 69.059.25

#### CONCRETE.

- 36/30 HUNTER, L. E.  
Concrete waterproofing . . . London, Sir Isaac Pitman and Sons, Ltd., 1947.  
xi, 128 p. front., photos., tables, diagrs.  
Bibliography: p. 125. 624.92 :620.193.19

#### CORK COMPOSITION.

- 36/32 FIELD information agency, technical.  
. . . The German cork composition industry; by Edmund Claxton . . . London, H.M. Stationery office (1946?) (Fiat final report no. 349).  
11 p. Duplicated.  
The investigator picked out cork floor tiles for special mention.  
(Copy also in Commerce and Industries). Pam. 674.83(43)

#### ELECTRIC heating, Industrial, High frequency heating.

- 36/39 AMERICAN society for metals, Cleveland.  
Induction heating by H. B. Osborn . . . P. H. Blace, W. G. Johnson, J. W. Cable (and) T. E. Eagan . . . (Cleveland, American society for metals, c1946).  
172 p. photos., diagrs.  
A series of five educational lectures on induction heating presented to members of the A.S.M. during the twenty-seventh national metal congress and exposition, Cleveland, February 4 to 8, 1946. 621.365.5

**ELECTRICAL UNITS.**

- 36/40 SAS, R.K. and F. B. Pidduck.  
The metre-kilogram-second system of electrical units. London, Methuen and Co., Ltd. (1947).  
(Methuen's monographs on physical subjects).  
v, 9 — 60 p. 539.71

**ELECTRICITY.**

- 36/41 BRITISH electrical and allied industries research association.  
. . . Annotated list of published reports, October, 1947.  
London, British electrical and allied industries research association, 1947.  
131 p.  
Supplement of E.R.A. reports since October 1st, 1947, attached to back cover.  
(In National Physical Laboratory). 621.3 : 016

- 36/42 POHL, R. W.  
Physical principles of electricity and magnetism . . . London, Blackie and Son, Limited (1947).  
xi, 356 p. illus., diags.  
Translated from the German by Winifred M. Deans. 537/538

**ELECTRICITY Supply Commission, Johannesburg.**

- 36/43 ELECTRICITY Supply Commission, Johannesburg.  
Vyf-en-twintig jaar: 'n register van die oorsprong, vordering en prestasies van die Elektrisiteitsvoorsieningskommissie, Unie van Suid-Afrika, 1923-1948. Johannesburg, Elektrisiteitsvoorsieningskommissie, 1948.  
63 p. front., illus., photos., ports., maps (fold.) 621.31(68)

**FLOORS.**

- 36/54 YORKE, F. R. S. and C. Roy Fowkes.  
Flooring materials . . . London, Faber and Faber, Ltd., (1948).  
234 p. plates, (photos.), tables, diags. 69.025

**HEAT.**

- 36/64 ROBERTS, J. K.  
Heat and thermodynamics . . . third edition. London, Blackie and Son, Limited (1949).  
xvi, 488 p. tables, diags. (one folding on back cover). 536

**HOUSES.**

- 36/65 GREAT Britain. Ministry of Health. Central housing advisory committee. Design of dwellings sub-committee.  
Design of dwellings: Report of the design of dwellings sub-committee . . . and report of a study group of the Ministry of town and country planning . . . London, H.M. Stationery office, 1944.  
75 p. plans.  
Chairman: The Earl of Dudley. Pam. 728.1

- 36/66 PICKERING, Ernest.  
Shelter for living . . . New York, John Wiley and sons, inc., (1947).  
xii, 370 p. front., photos., plans, tables, diags. 728

(Concluded from page 27.)

**Dimensional Specification for Refractory Brick. 30 pp**

In a foreword the Standards Bureau point out that "the necessity for the most efficient utilisation of the country's productive capacity of refractory brick and the conserving of supplies of materials required for the manufacture of moulds for special refractory shapes, calls for a limitation of the numbers of sizes and shapes of refractory brick produced in South Africa." They go on to say "this does not preclude the manufacture, where necessary, of special shapes to be agreed upon by manufacturer and customer."

The specification itself consists of sections dealing with dimensions, recommendations for use, together with tables showing the numbers of bricks, of a given size, required to turn circles of known diameters. There is also a page of sketches, showing eight different shapes recommended.

- 36/68 UNITED States, National Bureau of Standards.

. . . Strength of houses: application of engineering principles to structural design, by Herbert L. Whitlemore (and others). Washington, Government printing office, 1948. (Building materials and structures report B.M.S. 109).  
vi, 132 + p. map, tables, diags.  
Authors are Herbert L. Whitlemore, John B. Cotter, Ambrose H. Stang, and Vincent B. Phelan. 69.04

**HOUSES, Prefabricated.**

- 36/69 GLOAG, John and Grey Wornum.  
House out of factory . . . London, George Allen and Unwin Ltd., (1940).  
x, 144 + p. illus., 48 plates (photos.), diags. 693.002.22 : 728

**HOUSING.**

- 36/70 WARING, Arnold.  
Approach to better housing . . . London, Leonard Hill Limited, 1947.  
(x), 102 p. front., plates, photos., plans, diags. 728.1

**HOUSING. Statistics.**

- 36/71 UNITED States. Housing and home finance agency. Office of housing economics.  
Housing statistics handbook . . . Washington; Government printing office, 1948.  
ix, 170 p. tables, diags.  
"Statistics are included on the volume and cost of new housing production, on the size and characteristics of the existing stock of housing, and on the financial aspects of housing." Pam. 728.1:31

**INSULATION (electrical).**

- 35/58 CHATFIELD, H. W. and J. H. Wredde.  
Varnished cloths for electrical insulation . . . New York, Chemical publishing co., inc., 1947.  
x, 233 p. illus., diags. 621.315.614.72

**INSULATION (heat).**

- 35/59 CLOSE, Paul Dunham.  
Thermal insulation of buildings: a treatise on the principles of thermal building insulation for dwellings and other structures . . . New York, Reinhold publishing corporation, 1947.  
vi, 104 p. photos., tables, diags. 699.86

**IRRIGATION.**

- 36/82 UNION of South Africa. Department of Irrigation. Professional papers . . . Pretoria, Department of Irrigation (1947?)  
Paging various. maps, tables, diags. (some folding).  
Contents: Maximum flood curves, spillway discharges, free-board for dams, flood absorption of reservoirs, etc. 626.81/.85(68)(04)

**JOHANNESBURG.**

- 36/83 JOHANNESBURG. City.  
Town planning, schemes nos. 1-2. Johannesburg City Council, 1946-1947.  
2 vols. tables.  
Scheme no. 1 (of) 1946, scheme no. 2 of 1947. 711.4(682.2)

**LINOLEUM.**

- 36/88 FIELD information agency, technical.  
. . . The German linoleum and hard surface floor-covering industry; by Edmund Claxton. London, H.M. Stationery office, (1946?) (FIAT final report no. 350).  
32 p. Duplicated.  
"The general quality of German linoleum is inferior to that in the United States. On the other hand, greater attention, whether properly applied or not, is given to mixing, while calendaring techniques, as developed for other purposes than floor-covering manufacture, appear to be of real interest."  
(Copy also in Commerce and Industries). Pam. 677.187:69.025.3(43)

**METAL FINISHING.**

- 36/95 SIMONDS, Herbert R. and Adolph Bregman.  
Finishing metal products . . . second edition. New York, McGraw-Hill Book Company, inc., 1946.  
xii, 352 p. illus., photos., tables, diags. 621.795

**METALS.**

- 36/97 AUSTIN, J. B.  
The flow of heat in metals . . . (Cleveland, American Society for Metals, c1942).  
144 p. illus., tables, diagrs.  
A series of five educational lectures on the flow of heat in metals presented to members of the American Society for Metals at the twenty-third National Metal Congress and Exposition, Philadelphia, Pa., October 20-25, 1941.  
536.212.2

**PAINT.**

- 36/112 AMERICAN Society of Testing Materials. Committee D-1 on paint, varnish, lacquer, and related products. A.S.T.M. standards on paint, varnish, lacquer and related products . . . specifications, methods of testing, definitions of terms . . . Philadelphia, American Society for Testing Materials, 1942. xi, 408 p. photos., tables, diagrs.  
667.6/.8 :389.6

**PAINTING AND DECORATING.**

- 36/113 LAWRENCE, James.  
Painting and decorating craft practice . . . London, E. and F. N. Spon Ltd., 1948. (Architectural and building series, ed. by Anthony M. Chitty).  
152 p. illus., plates (photos).  
698.1

**PARTITIONS.**

- 35/80 UNITED States. National Bureau of Standards.  
. . . Fire resistance of structural clay tile partitions, by Harry D. Foster, Earl R. Kinkston and S. H. Ingberg. Washington, National Bureau of Standards, 1948. (Building materials and structures report BMS 113).  
19 p. illus., photos., tables, diagrs.  
"The results of fire-endurance or hose-stream tests of 20 structural clay tile partitions tested at the National Bureau of Standards are given. The partitions were 3, 4, and 6 in. thick, exclusive of the plaster. Some of the partitions were built of tile laid on end; some, with the tile laid on side; and some, with the tile laid alternately on side and on end. The fire-endurance and the hose-stream tests in this series were made on the same partitions. The hose-as meeting the hose-stream requirements applicable to their stream tests indicated that tile partitions can be considered respective fire-resistance ratings".  
Pam. 691.42.018.44.

**PLASTIC materials.**

- 35/85 MODERN plastics encyclopedia. New York, Plastics catalogue corporation, 1948.  
1674 p. illus., tables, diagrs.  
(Not available on loan.)  
679.5(031).

**PLASTIC materials. Bibliography.**

- 35/86 SOUTH African Council for Scientific and Industrial Research. Library and information division.  
. . . Books and pamphlets on plastics. Pretoria, Council for Scientific and Industrial Research, 1948. (Library class list no. 1).  
5 p. Duplicated.  
This list gives books and pamphlets on plastics in the stock of the C.S.I.R. Library and Information Division as at 10th January, 1949.  
(Copies available on application.)  
Pam. 679.5 : 017.1(862.1 Pretoria) South.

**PLUMBING.**

- 36/119 GREAT Britain. Department of Scientific and Industrial Research. Building research station.  
. . . Plumbing in America: a report on a visit to U.S.A. and Canada on plumbing, by F. L. Barrow . . . London, H.M. Stationery office, 1948. (National building studies special report no. 2).  
24 p.  
**Main section:** Domestic drainage; Disposal pipework above ground; water supply; appliances and fittings; materials; constructional techniques; some architectural aspects of plumbing.  
Pam. 628.6(7)

**POLES**

- 35/87 SOUTH African Standards Institution.  
. . . Standard specification for creosoted wooden telephone, telegraph, electric light and power transmission poles. (Johannesburg), South African Standards Council, for South African Standards Institution, 1949. (S.A.S.S. 346-1948). Separate title page and text in Afrikaans.  
(Copies available from S.A. Bureau of Standards, Private Bag 191, Pretoria, price 5/-).  
Pam. 674.04 : 621.315.668.1 : 389.6.

**REFERENCE books.**

- 35/103 SOUTH African Council for Scientific and Industrial Research. Library and information division.  
Some useful reference books for the small industrial library in South Africa. Pretoria, South African Council for Scientific and Industrial Research (1948).  
5 p. Duplicated.  
Pam. 025.5 : 06(68).

**REFRIGERATION.**

- 36/128 SPARKS, N. R.  
Theory of mechanical refrigeration . . . New York, McGraw-Hill Book Company, Inc., 1938.  
ix, 225 p. tables, diagrs. (some folding).  
621.56

**RURAL planning.**

- 35/1017 OXFORD. Agricultural Economics Research Institute.  
Country planning: a study of rural problems. London, Oxford University Press (1946).  
vi, 288 p. front., plates, tables, folding diagrs.  
711.3.

**SCIENTIFIC research organizations. South Africa.**

- 36/131 SOUTH African Council for Scientific and Industrial Research. Liaison division, comp.  
Research organisations in the Union of South Africa. Pretoria, Council for Scientific and Industrial Research (1948).  
Each section paged separately. Charts. Duplicated. This deals with scientific research institutions only.  
Pam. 5+6 : 061.6(68.01)

**SEWAGE disposal.**

- 35/111 ALLEGHENY County Sanitary Authority.  
Report on the proposed collection and treatment of municipal sewage and industrial wastes. Pittsburgh, Allegheny County Sanitary Authority, 1948.  
80 p. illus., photos., plans, tables, diagrs.  
Pam. 628.3(748).

**SOIL for building construction.**

- 34/185 ILLINOIS. University. Engineering experiment station.  
. . . The suitability of stabilized soil for building construction, by Edwin L. Hansen. Urbana, University of Illinois, 1941. (Bulletin vol. 39, no. 17, 1941; Engineering experiment station, bulletin series no. 333).  
40 p. illus., tables, diagrs.  
"Soil is one of the most abundant materials available throughout the world. This fact along with the demand for local construction material led to this investigation on the suitability of soil for use as a building material. Climatic conditions in most parts of the world make it necessary to treat the soil to make it durable. In this investigation emulsified asphalt has been used for this purpose."  
(In National Building Research Institute.)  
Pam. 691.41.

**SOUND absorbent materials.**

- 34/186 ILLINOIS. University. Engineering experiment station.  
. . . Sound-proof partitions: an investigation of the acoustic properties of various building materials, with practical applications, by F. R. Watson . . . Urbana, University of Illinois, 1922 (Bulletin vol. 19, no. 28, March 2, 1922; Engineering experiment station no. 127).  
85 p. illus., pls. (photos.), tables, diagrs.  
Bibliography: pp. 77-78.  
(In National Building Research Institute.)  
Paw. 534.83 : 699.844.

**SOUTH AFRICA. Directories.**

- 36/133 CAPE Times South African Directory 1948-49 . . . Cape Town, Cape Times, Limited, 1948.  
1 xviii, 45, 2823 p. diagrs.  
(Not available on loan).  
058.7(68)

**STEEL CASTINGS.**

- 36/136 **FIELD** information agency, technical.  
 . . . The German steel casting industry: by Max T. Ganzaug, Charles W. Briggs. London, H.M. Stationery office, (1946) (FIAT final report no. 387). 149 p. Mimeographed.  
 "The steel foundries of Germany were investigated with the purpose of ascertaining (1) the type and classification of steel structures produced as castings, (2) the processing methods, (3) the mechanical properties of carbon and alloy cast steels, (4) the type and character of defective castings, (5) the appearance of castings, (6) research in steel castings and (7) plant layout and equipment.  
 The processing methods investigated consisted of the following: (1) raw materials, (2) steel-making practices, (3) tapping and pouring methods, (4) preparation and distribution and reclamation of moulding materials, (5) sand technology, (6) moulding and core making practices, (7) cleaning technique, (8) the welding of steel castings, (9) heat-treatment methods, (10) inspection and testing practices.  
 (Copy also in Commerce and Industries.)  
 Pam. 621.741.4(43).

- 36/139 **WOOD**, Robert Williams.  
 Supersonics: the science of inaudible sounds . . . Providence, Brown university, 1939. (Charles K. Colver lectures, 1937). viii, 162 p. diags.  
 Bibliography: pp. 150-162.  
 534.321.9

**STEEL, Structural. Welding.**

- 34/189 **ILLINOIS**. University. Engineering experiment station.  
 . . . Fatigue tests of butt welds in structural steel plates, by Wilbur M. Wilson and Arthur B. Wilder. Urbana, University of Illinois, 1939 (Bulletin vol. 36, no. 42, January 20, 1939; Engineering experiment station bulletin no. 310). 58 p. illus., tables, diags.  
 "The plates were  $\frac{3}{4}$  in. thick and from  $5\frac{1}{2}$  in. to 6 in. wide at the middle where the weld occurred. For one series of 21 specimen the plates were of carbon steel, for a second series of 6 specimens they were of silicon steel. Part of the carbon-steel specimen and all of the silicon-steel specimen were welded by an automatic carbon-arc process. Metallurgical studies were made of the welds and of the base plate adjacent to the welds to determine variations in the properties of the materials. Several specimens for which the fatigue failure occurred in the weld were examined to determine the path of failure."  
 (In National Building Research Institute.)  
 Pam. 669.14-41 : 624.078 : 620.178.3
- 34/190 **ILLINOIS**. University. Engineering experiment station.  
 . . . Fatigue test of commercial butt welds in structural steel plates . . . by Wilbur M. Wilson (and others) . . . Urban, University of Illinois, 1943. (Bulletin vol. 41, no. 8, October 12, 1943; Engineering experiment station, bulletin series no. 344). 140 p. illus., tables, diags.  
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- . . . Reports of the trustees for the year ended December 31 . . . Pretoria, State library.  
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**STEEL. Testing.**

- 35/117 **LONDON**. Institute of Metals.  
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**STRAINS and stresses.**

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**TOWN PLANNING.**

- 36/145 **ASSEMBLÉE** de constructeurs pour une renovation architecturale (ASCORAL).  
 . . . Les trois établissements humains. Paris, Donoël (1944) (Collection ASCORAL, sections 5 et 5b, une civilisation du travail, 7e volume). 270 p. illus. pls. (some col.) plans.  
 This series is edited by Le Corbusier. 331
- 36/146 **SIMON**, E. D.  
 Rebuilding Britain — a twenty year plan . . . London, Victor Gollancz, Ltd., 1945. 256 p., photos., plan, tables, diags. 711(42)
- TOWN planning. Law. Great Britain.**
- 35/122 **KEKWICK**, James.  
 Town and country planning law . . . London, Stevens & Sons, Ltd., 1947. xvii, 556 p. 711(094.56) (42).
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- 35/124 **JOSELIN**, E. L.  
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 . . . Strength and stability of concrete masonry walls . . . by Frank E. Richart, Robert B. B. Moorman, Paul M. Woodworth. Urbana, University of Illinois, 1932. (Bulletin vol. 29, no. 89, July 5, 1932; Engineering experiment station, bulletin no. 251). 38 p. illus., tables, diags.  
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**WATER heaters.**

- 34/210 **ILLINOIS**. University. Engineering experiment station.  
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**WATER PURIFICATION. Corrosion Control.**

- 36/156 **PURDUE** University. Engineering experiment station  
 . . . Scale formation in water heaters and methods of prevention, by J. M. Krappe. Lafayette, Indiana, Purdue University, 1940. (Purdue University engineering bulletin, vol. xxiv, no. 3a; Research series no. 74). 27 p. tables, diags. Pam. 697.4:620.191.32

**WELDED structures.**

- 34/211 **ILLINOIS**. University. Engineering experiment station.  
 . . . Residual stresses in welded structures . . . by Wilbur M. Wilson and Chao-Chien Hao. Urbana, University of Illinois, 1946. (Bulletin vol. 43, no. 40, February 26, 1946; Engineering experiment station, bulletin series no. 361). 80 p. illus., tables, diags.  
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**WOOD**

- 34/212 **RICHARDSON**, W.  
 The practical timber merchant . . . London, Technical Press, Ltd. (1947?). viii, 247 p. illus., tables.  
 "Being a guide for the use of building contractors, surveyors, builders, etc., comprising useful tables for all purposes connected with the timber trade, marks of wood, essay on the strength of timber, remarks on the growth of timber, etc." — Sub-title.  
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- 36/167 **CORKHILL**, Thomas.  
 A glossary of wood . . . London, The Nema Press, Ltd., the proprietors of "Wood", 1948. viii, 656 p. diags.  
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## NEW PROJECTS

**A**T the request of readers we are still including this feature, namely, new building projects in Southern Africa. Our object here is to provide as early advance information as possible. In so doing it is more than likely that some of the information will be a long way ahead of actual building plans. That is, however, unavoidable in the circumstances. We would appreciate readers keeping us posted with news about either fresh items or more up-to-date facts about those that have been published already in this feature. In this way, we can make it of more use to our readers.

**Bulawayo, S. Rhodesia :** New Post Office. Estimated cost, £150,000. Mental Hospital. Estimated cost, £18,000.

**Bloemfontein :** Sixty-two sub-economic houses.

**Durban and Pietermaritzburg :** New Government buildings to be erected in Durban and Pietermaritzburg at a total cost of over £500,000. These include the Agricultural faculty building for the Natal University in Pietermaritzburg (£250,000), a new home for Nurses at Fort Napier, also in Pietermaritzburg (£125,000), new Government garages at Durban (£135,000), and a new police station at Mayville, Durban (£43,000).

Other projects include : improvements at Cedara Agricultural College (£70,000), Amatikulu Leper Institution (£44,000), Eshowe reformatory (£36,000), Government Garage, Pietermaritzburg (£35,000), and telephone exchanges at Durban North (£13,000) and Durban Central (£10,000). The figures are total estimated costs.

**East London :** Enlargement of Frere Hospital and the building of a separate non-European hospital.

**Johannesburg :** Road construction : £105,825. Paving of footpaths, £30,000. Municipal sports field at Emmarentia. This includes the construction of a Rugby field and cricket oval at a cost of £10,000.

**Pietersburg :** New Technical College. Estimated cost, £59,000. Reconversion of existing buildings on the military aerodrome into hostels for students.

**Salisbury, S. Rhodesia :** Building of a block of flats at Belvedere to accommodate members of Salisbury City Council's staff, totalling four blocks each of eight flats. Estimated cost, £49,861.

**Wemmershoek :** Building of a larger dam and provision for a new course for the pipeline. Final cost of the dam, pipelines and service reservoirs, is estimated at £7,300,000.

**Zorgvliet :** Scheme to build thirty flats at an estimated cost of about £33,000.

## TENDERS INVITED

**T**HE following are particulars of the more important tenders which have been invited up to the time of going to press for public works by Government Departments, Provincial Administrations and Municipalities. In each case the date by which the tender must be submitted is given. While every endeavour will be made to maintain accuracy in these columns it is pointed out that readers using this information do so entirely at their own risk.

### AIR CONDITIONING AND REFRIGERATION PLANT, ETC. :

**Durban Municipality :** Alteration and additions to cold storage equipment, Municipal abattoir. Tender No. E. 2218. Electricity Department, Durban. Due, 25/11/49.  
**Bulawayo, S. Rhodesia :** The construction of up to 10 earth dams on railway block No. 2, West Nicholson The Cold Storage Commission of Southern Rhodesia. P.O. Box 953, Bulawayo.

### BUILDING, ETC. :

**Heilbron Municipality :** The erection of a new swimming bath, change rooms and pavilion in Heilbron, for the Heilbron Municipality. Architects : Gerard Moerdyk and Watson, 124/6, Sanlam Buildings, Andries Street, Pretoria.

### ELECTRICAL EQUIPMENT, ETC. :

**Durban Municipality :** 33 K.V. Pilot Cable and joints. Tender No. 2219. Electricity Department Offices, Alice Street, Durban. Due, 2nd December, 1949; 33 K.V. Cable, Pilot Cable and joints. Tender No. 2225. Electricity Department, Durban. Due, 6/1/50; Electrical material : H.R.C. fuses, fittings, etc., and 550 volt, 3-phase switch panels. Tender No. E. 2226. Electricity Department, Durban. Due, 6/1/50.

**Pretoria Municipality :** Power Station "B" — first stage : F. 33 K.V. and lower voltage cables. Form of tender No. 806. Town Clerk, Pretoria. Extended to : 17/11/49.

**Rustenburg :** The supply and erection of an electric pump and motor at the Commercial High School, Rustenburg. Gerard Moerdyk and Watson, 124, Sanlam Buildings, Pretoria.

**Rustenburg Municipality :** 300, 400 and 500 K.V.A. transformers. Contract No. E./497. Electrical Engineer, Rustenburg. Due, 30/11/49.

### ENGINEERING EQUIPMENT, ETC. :

**Johannesburg :** Supply, delivery, erection and putting into service of two gas-fired lime kilns with all auxiliaries at Zuikerbosch pumping station, for the Rand Water Board. Contract 732. Chief Engineer, Rand Water Board, Contract 732. Chief Engineer, Rand Water Board, 3, Fraser Street, Johannesburg. Extended to : 22/11/49.

**De Aar :** Generating plant for De Aar. Tender No. C.103. S.A. Railways Tender Board, P.F.A.C. Building, 1<sup>c</sup> De Villiers Street, Johannesburg.

**Natal Provincial Administration :** Construction of highway bridge over the Little Tugela River near Winterton of a reinforced concrete beam and slab rigid frame of 4 spans, 210 feet x 32 feet overall and, approximately, 34 feet high. Provincial Roads Engineer, P.O. Box 417, Pietermaritzburg. Due, 16/11/49.

# TENDERS ACCEPTED

## BUILDING AND ALTERATIONS, ETC. :

**Post Office, Public Offices and Police Station and Quarters**, Victoria West, for the Department of Public Works. Tender No. 24/1/861. P.W.D. 216/217. Stevens and Co., Bloemfontein. Contract No. 1. £33,617. Contract No. 2., £24,971.

**Additions, new Charge Office and Single Quarters** for the Central Police Barracks, Pretoria. Tender No. 24/1/1515. P.W.D. 225. S. J. Addis, Pretoria. £51,781.

**New Gerdview Afrikaans Medium Primary School** for the Provincial Administration. Messrs. H. D. Abery, Ltd., Pretoria. £31,095.

**Laboratory, Stacking Shed and House for Officer-in-Charge**, Rietrivier, for the Department of Public Works, O.F.S. Tender No. 24/1/2006. P.W.D. 229. F. C. Holton, Roodepoort. £14,123.

**Supply, delivery and placing into position of additional Steel Shelving** for the State Library, Pretoria. Tender No. 24/1/106. P.W.D. 235. S.A. Steel Equipment Co. (Pty.), Ltd., Johannesburg. £10,497 6s. 6d.

**Automatic Exchange Building**, Amanzimtoti, for the Department of Public Works. Tender No. 24/1/2007. P.W.D. 236. J. A. Grant (Pty.), Ltd., Durban. £10,500.

**Additions, Repairs and Renovations to Police Post**, Lusikisiki, for the Department of Public Works. Tender

**Ermelo Municipality** : Sewerage scheme. Contracts S. 4 and S. 5/1949. Town Clerk, Ermelo. Extended to 24/11/49.

**S.A. Railways** : Boiler plant and boiler house. Tender No. C. 340. S.A. Railways Tender Board, 715, P.F.A.C. Building, 15 De Villiers Street, Johannesburg. Extended to 29/12/49.

**Mossel Bay Municipality** : Sewerage scheme — Area "B": Supply and installation of sewage pumping equipment including pumps, motors and fittings in sewage pump house and rising main. Consulting engineer: Ninham Shand, 806, Groote Kerk Building, Parliament Street, Cape Town. Contract documents on deposit of £2-0-0. Due, 10/12/49.

**Parow Municipality** : Sewerage pumps and pump house equipment. Town Clerk, Parow. Extended to 22/11/49.

## LABORATORY EQUIPMENT, ETC. :

**Pretoria** : Chemicals and laboratory apparatus to Agricultural Research Institute, Pretoria. Tender No. S.O. 3706. Due, 17/11/49.

## WATER AND IRRIGATION EQUIPMENT, ETC. :

**Bloemfontein Municipality** : Waterworks extensions : Supply, delivery and installation of equipment and materials for the filtration plant extensions at Mazelspoort. Contract 18/1949. Consulting Engineer : N. Shand, 806, Groote Kerk Building, Parliament Street, Cape Town. (2 copies of contract documents on deposit of £10-0-0). Due, 18/1/50.

**Johannesburg** : The sinking of three boreholes at Baragwanath Hospital, Johannesburg. The Engineer, Johannesburg Hospital.

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No. 24/1/1135. P.W.D. 234. E. E. Harris and Sons, Kokstad. £2,035.

**Quarters for Coloured Labourers**, Forestal District, for the Department of Public Works. Tender No. 24/1/266 : P.W.D. 226. J. B. Hammond (Pty.), Ltd., Worcester. £10,641 8s. 0d.

**New Garage and Storeroom, Alterations, Repairs and Renovations to Health Centre**, Thaba 'Nchu, for Department of Public Works. Tender No. 24/1/1135. P.W.D. 234. P. E. C. Beckman, Bloemfontein. £1,870.

**Additions and Alterations to and Soil Drainage to Resident Commissioner's Residency**, Ingaavuma, for the Department of Public Works. Tender No. 24/1/1572. P.W.D. 220. Bongets and Co. (Pty.), Ltd., Zululand. £1,843.

#### COOKING EQUIPMENT, ETC. :

**Four Cooking Ranges** to the State Alluvial Diggings, Alexander Bay. Tender No. 25/1/303. S.O. 3486. C. Chubb and Maxwell, Ltd., Cape Town. £296 10s. each.

#### ELECTRICAL EQUIPMENT, ETC. :

**One only 200 K.V.A. Transformer** to Agricultural College, Potchefstroom. Tender No. 24/1/230. P.W.D.S. 373. National Engineering (Pty.), Ltd., Johannesburg. £419 5s.  
**One only H.T. Switchboard** (as above). Metropolitan Vickers (S.A.), (Pty.), Ltd., Johannesburg. £308 15s

**Outdoor Air Break Switches and Relays** for Bloemfontein Municipality. Enquiry No. 11/1949. Woolf Engineering Co., Ltd., Metropolitan Vickers, (S.A.), (Pty.), Ltd.

**Electric Meters** for Bloemfontein Municipality. Enquiry No. 12/1949. S.A. General Electric Co., Ltd., Hubert Davies and Co., Ltd., Robertson and Moss, Ltd., Woolf Engineering Co., Ltd.

**11 K.V. 250 M.V.A. Switchgear** for Bloemfontein Municipality. Enquiry No. 6/1949. Messrs. E. D. Phillips. £3,604 16s.

#### ENGINEERING EQUIPMENT, ETC. :

**Turbine Pumping Plant** for the Research Institute, Pretoria. Tender No. 25/1/1026. S.O. 3502. Stewarts and Lloyds, S.A., Ltd., Pretoria. £132 12s. 4d.

#### HOSPITAL AND LABORATORY EQUIPMENT, ETC. :

**One hundred Steel Lockers for Hospital use** to the Tuberculosis Hospital, Umtata. Tender No. 25/1/1417. S.O. 3513. S.A. Steel Equipment Co., (Pty.), Ltd., Johannesburg. £7 8s. 9d. each.

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#### ROADS :

**Tarmacadamising of Roads** at Quaggapoort Police Dog Depot. Tender No. 24/1/1613. P.W.D. 232. The Trinidad and General Asphalt Contracting Co., Johannesburg. £798.

**Repairs to Portion of Tarmacadamised Surface of Roadway** leading to Radio Station. Tender No. 24/1/803. P.W.D. 242. Gaze's Construction and Hard Tennis Court Co. (Pty.), Ltd., Johannesburg. £256 13s. 4d.

#### WATER AND IRRIGATION EQUIPMENT, ETC. :

**Installation of Waterborne Drainage** to the Technical High School, Adelaide. Tender No. 24/1/1089. P.W.D. 230. Graham C. Mortimer, Grahamstown. £4,260 17s. 7d.



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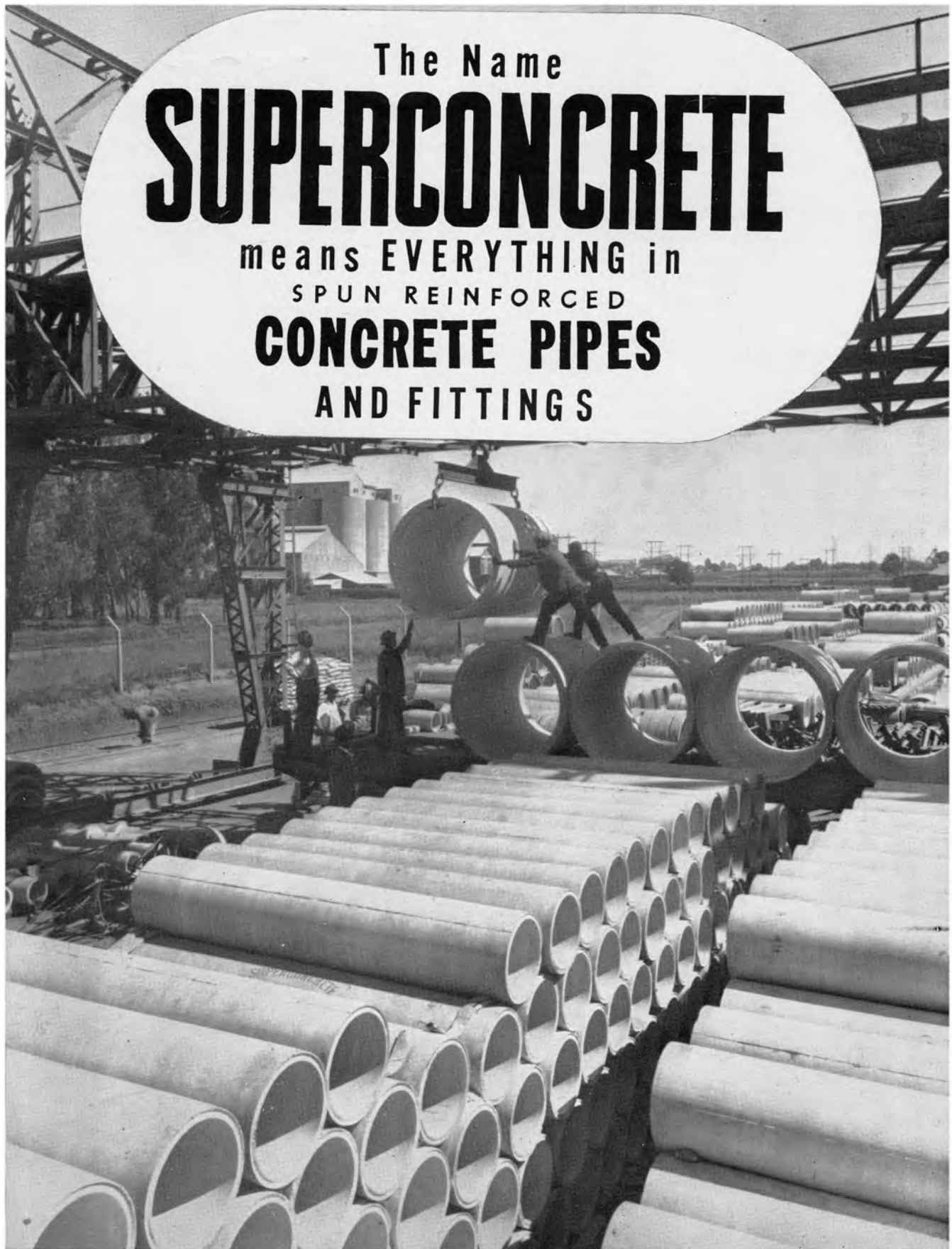
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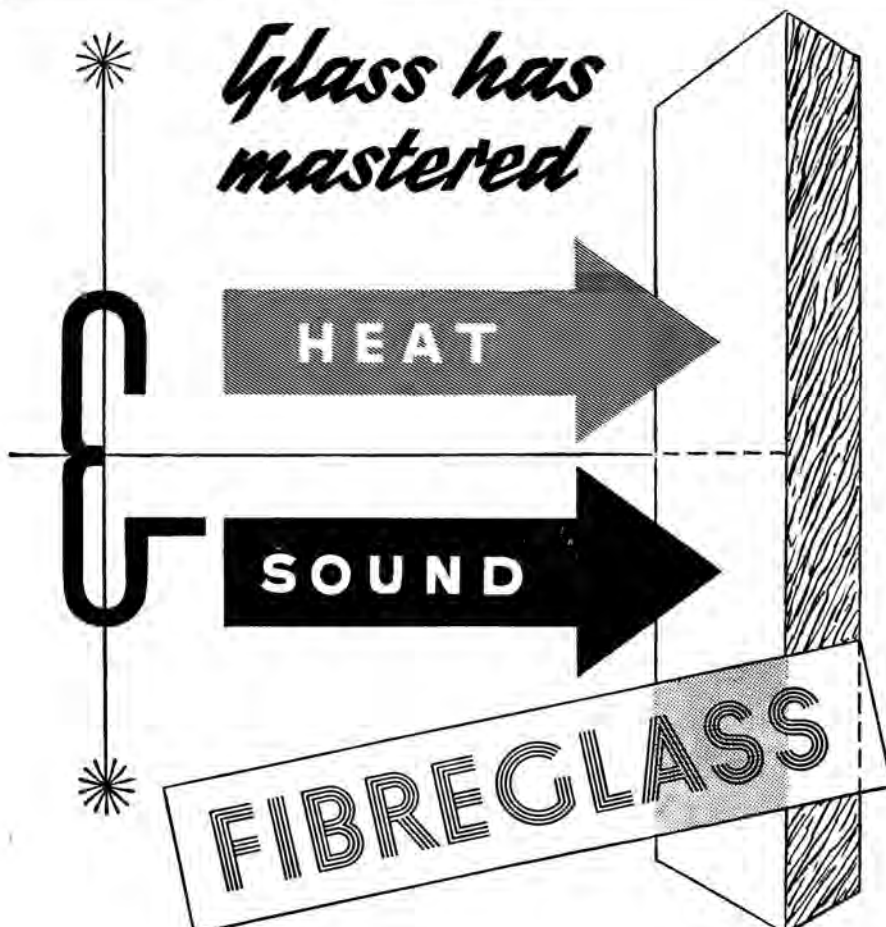
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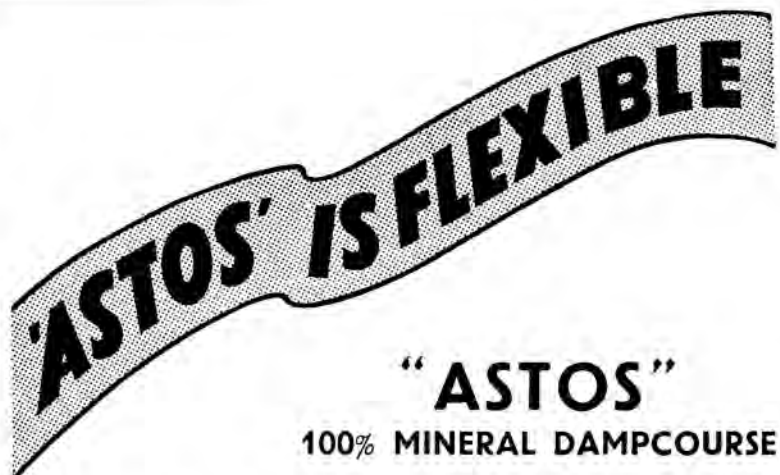
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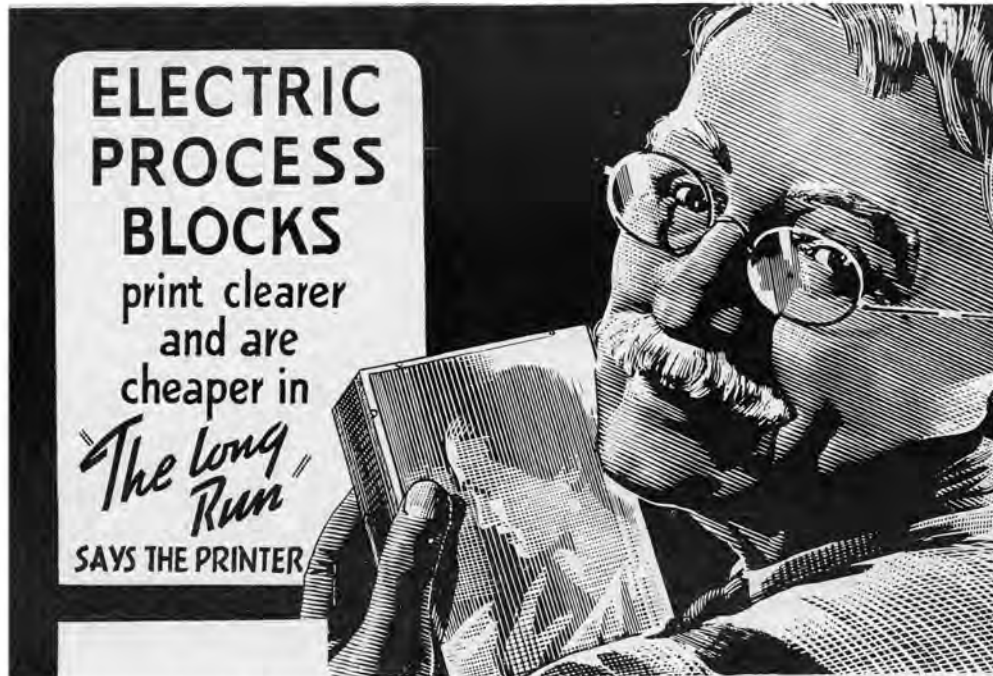
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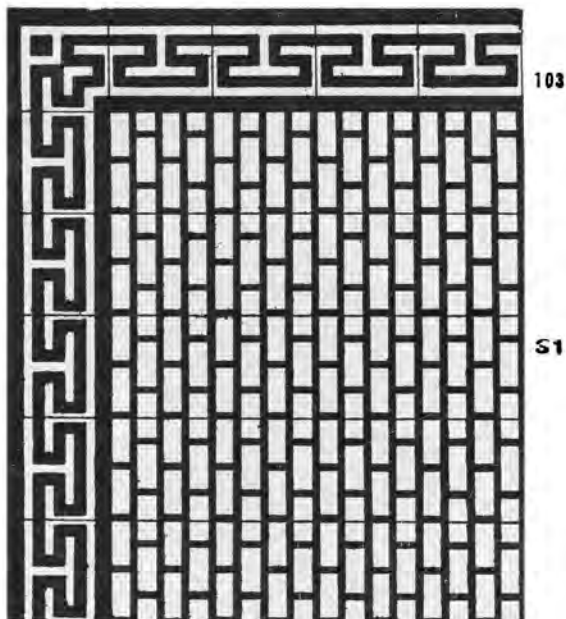
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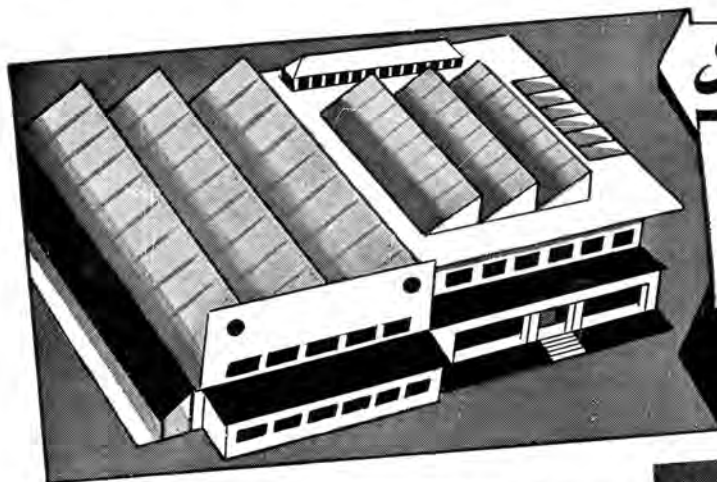
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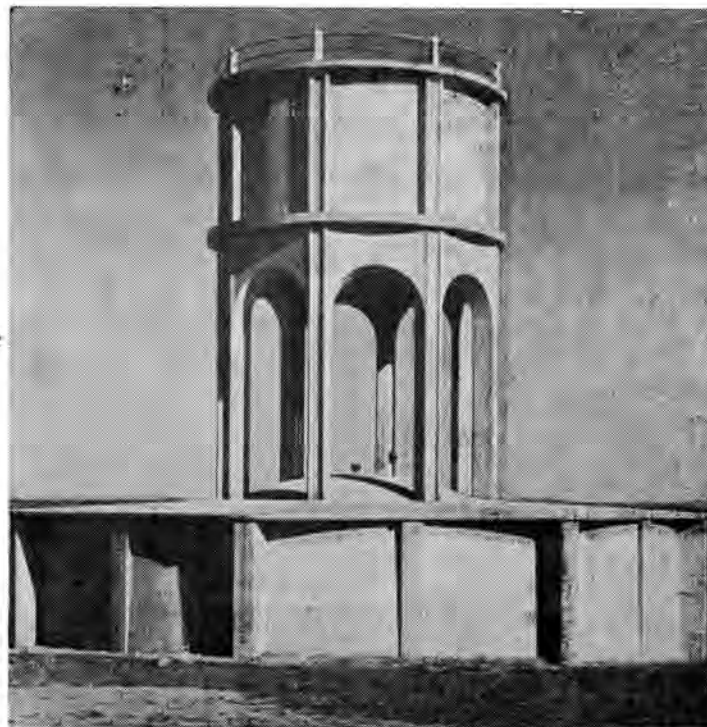
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