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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 an the Provincial and Municipal Governments of South Africa

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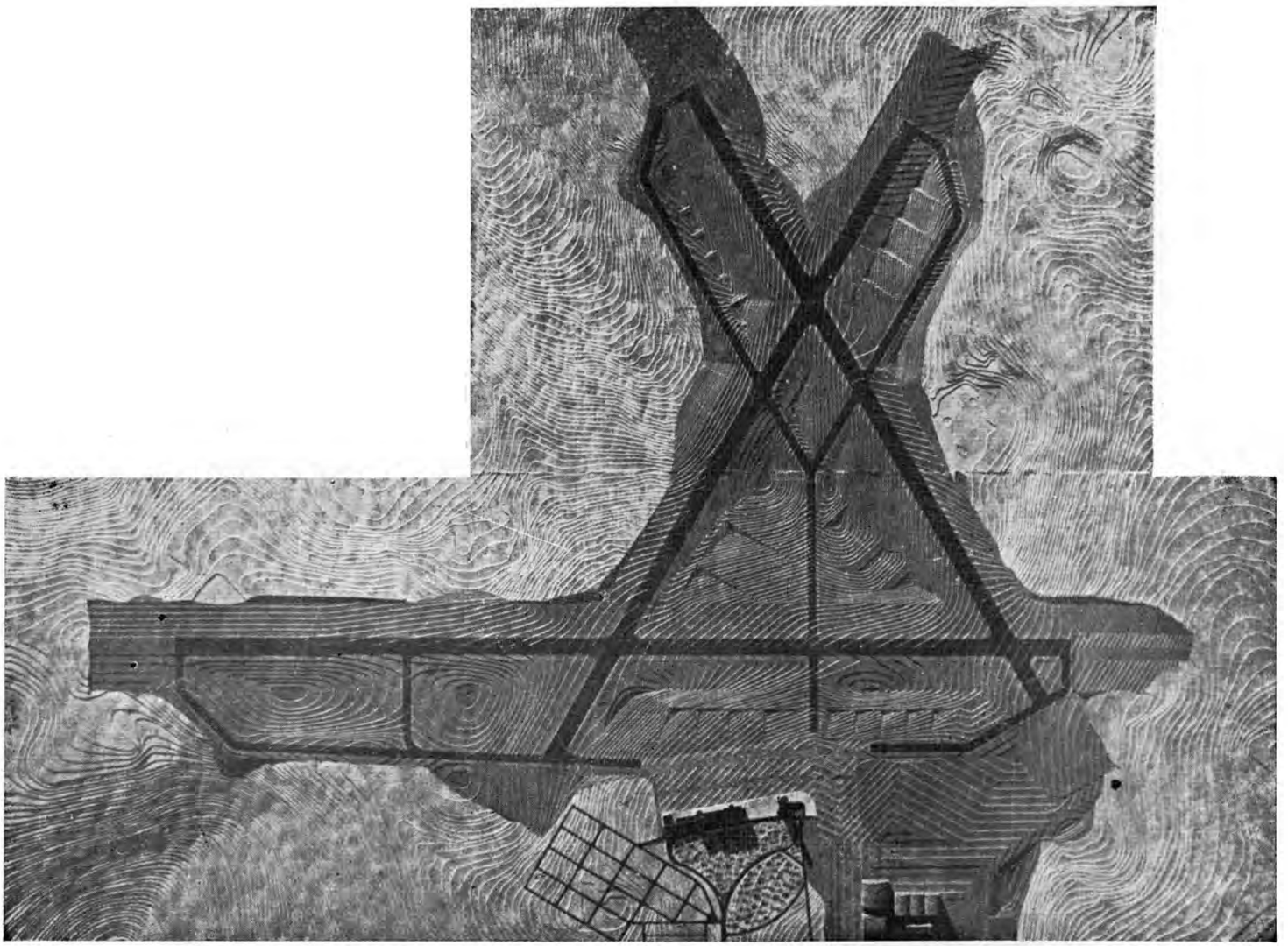
CONTENTS



Photograph: S.A.R. & H.

SCALE MODEL OF JAN SMUTS AIRPORT.

JAN SMUTS AIRFIELD

SOUTH AFRICA'S NEW INTERNATIONAL AIR PORT AT KEMPTON PARK

IT IS OBVIOUS that South Africa intends participating fully in the world-wide development which is taking place in air travel facilities in this post-war period.

An immense project of the South African Railways and Harbours, which is now beginning to take shape, is the construction of an International Airport for the Union near Kempton Park, in the Transvaal. It is to be named the Jan Smuts Airfield in honour of our great statesman and soldier, Field-Marshal the Right Honourable J. C. Smuts.

During the recent Royal tour considerable comment was made on the presence in South Africa at the same time of two active Field-Marshals, His Majesty and our own Premier.

Once again when Field-Marshal Sir Bernard Montgomery visits this country at the end of this year there will be two Field-Marshals together in our land. Further when Field-Marshal Montgomery, at one of the few public functions he has undertaken for the period of his visit, opens the main entrance portals of the International Airport on December the 3rd, the names of two Field-Marshals will be engraved together for posterity in South Africa on the same erection; the one naming the Airport being engraved across the frieze of the double carriage way portal, and the other on a stone incorporated in the base, commemorating the opening of the main entrance by the visiting Field-Marshal, who is so dear to many South Africans.

At the beginning of October the main approach up to the portal was almost virgin veld, but work is proceeding very rapidly and despite the very short time available, there seems no doubt that the entrance will be complete for the ceremony.

A temporary turn off to the double carriage way approach is to be made from the Kempton Park–Germiston main road. Eventually the approach road to the Airport will pass under the electrified rail track running parallel to the main road by means of a subway and will cut across country to Johannesburg, entering the city through the north-eastern suburbs.

The organization required to cope with a project such as the new international airport is by force of circumstances large and complex, and embraces amongst other things a large stores organization, a transport system for materials, the maintenance of light and heavy plant, the policing of the site and housing of the Native labour and the European employees and their families.

If the housing of the workers close to the site of their work was not undertaken there would be considerable loss of efficiency due to excessive travelling to and from work with consequent cost increases.

Considerable progress has been made during the year with temporary housing for plant operators and other workers and officials and their families. Seventy-nine temporary houses have been completed in addition to the Native compound, stores and many other temporary buildings.

Apart from a certain amount of wood and iron and wood and asbestos building, three forms of temporary construction have been used to date.

The first type of construction, loosely termed wattle and daub, comprised a concrete floor foundation mat and walls with inner and outer sheeting of horizontal split gum poles from the site, spiked to vertical studding and door and window frames as required. After the sheeting has been fixed, the walls are filled from the top with earth dagga well worked down in between the split poles and around the studs and door and window frames. The roofs are simply constructed and are covered with thatch or corrugated iron.

In the next type the internal sheeting of split gum poles was dispensed with and the external walls were lined with and the internal walls were built of sun-baked mud bricks, with a layer of mud dagga filling the space between the lining and the sheeting. The roofs were again of thatch or corrugated iron.

The type of construction at present favoured uses cavity external walls built of burnt brick laid on edge, and it is anticipated that this form will have several advantages over the previous types; further it will probably not materially vary the cost of the temporary buildings.

Photograph: S.A.R. & H.

TEMPORARY HOUSES.

The housing is grouped in two villages — the European and the Non-European village — and electric light has been installed in both groups.

A feature of the European village is the allocation of a fenced site for each dwelling and the lining of the streets with young trees. Many of the cottages are surrounded by newly established gardens, which are attractive and green, and they add greatly to the general amenities of the village, pointing to the success of the idea of allotting a site to each individual dwelling.

The social and recreational requirements of the village have not been overlooked. A recreational club has been built in which cinema shows are put on regularly and which has a billiard room attached. Sports fields have been laid out and hard tennis courts and a turfed rugby field have already been provided.

The control centre of the project is the Resident Engineer's group of offices, situated under some shady trees around what used to be the old farmstead, which is now used as an official residence. This is located near the northern end of the main runway.

The stores buildings, housing much valuable equipment, material and spare parts, covers a considerable area and is located near the southern end of the main runway. This area is fed by a railway siding and from there further tracks are taken onto the runways for the delivery of construction materials. These tracks will be extended as required.

Among the preliminary works carried out so far is the construction of two reinforced concrete reservoirs each holding 100,000 gallons of water and the sinking of two boreholes to 167 and 250 feet respectively, yielding together 5,000 gallons an hour. Further boreholes have also been sunk, bringing the total available supply to approximately 10,000 gallons an hour.

This water supply is used for construction work and for the irrigation of the nursery area, consisting of some 40 acres, situated near the south end of the main runway. The nursery is a most important division, as in accordance with current practice overseas, the airport will be equipped with a number of public attractions embracing a swimming bath and tennis courts, while an elaborate layout of gardens and lawns

Photograph: S.A.R. & H.

" WATTLE AND DAUB " CONSTRUCTION.

has been planned. The horticultural preparations of the ground also include the turfing of some 900 acres for flight strips and the areas round the buildings. This work is being undertaken by a fully qualified horticulturalist in the employ of the construction organization. Some twenty experimental patches of grass have been planted to ascertain which grass is most suitable to the site and amongst them are some grasses imported from Abyssinia.

Departing from this very brief description of some of the complexities of the organization required for the project, a short description of the airport project proper with an indication of the progress made to date will be given.

The site is extremely well situated and falls away in almost every direction, and the area acquired for the construction of the Jan Smuts Airfield is 3,776 acres and permits of extensions and the duplication of runways when required. The airfield is to the east of the railway line at Kempton Park, midway between Pretoria and Johannesburg on the road route via Germiston.

The layout of the airport comprises a main runway 10,500 feet long with two secondary runways 8,250 feet long. The main runway can be extended to the north by 3,200 feet and to the south by 1,000 feet if required and each of the secondary runways can be extended substantially. All the runways can be duplicated, if required, without difficulty on the layout adopted. The main runway will be 300 feet wide and the secondary runways will be 200 feet wide. Eighty per cent. of the landings will take place on the main runways. Ample taxiways are to be provided, each of which will have a width of 100 feet. The airport in general will approximate the requirements of a P.I.C.A.O. Class A aerodrome and will be equipped with blind landing gear.

In addition to port of entry and terminal buildings, which are essential for an international airport, there will be a large storage hangar with a clear opening 250 feet wide and 50 feet high, and a depth of 250 feet. As the airport will serve as the headquarters of South African Airways, there will also be a servicing hangar and the necessary workshops and stores.

Photograph: S.A.R. & H.

NATIVE COMPOUND.

The major portion of the work is being carried out departmentally by the S.A.R. and H., but a contract of £224,000 for earthwork and drainage of the Eastern portion of the airport has recently been placed and work is progressing satisfactorily. This work entails 1,400,000 cubic yards of earthworks and is to be completed in two years.

The staff working on the departmental section of the airport has been increased to 250 Europeans and 800 non-Europeans and the work has progressed to such an extent that more than 1,000,000 cubic yards of excavations of the estimated 3,800,000 cubic yards have now been completed and during July, 1947, a record of 100,000 cubic yards was moved. Further some 400 acres of plantation have been cleared.

One of the problems which was given detailed and careful consideration was the compacting of the runways and the final treatment was only evolved after careful practical experiment. The process of compacting being of the gravest importance, is proceeding 24 hours a day for seven days a week — it is proceeding continuously and is being done by light and heavy sheepsfoot rollers.

As in all aerodromes, drainage has been an important consideration and it is interesting to note that when complete 7½ miles of large section underground drainage will be installed, some of it double section and some of it single section, 6ft. 6in. high approximately to the crown and 6ft. wide. In addition to this there will be 8 miles of 36in. to 24in. underground pipe drainage lines.

The runways themselves are to receive a 20in. layer of crushed stone and a finish of tar-macadam. This calls for the supply of 1,000,000 yards of crushed stone. This will be delivered by rail on to the site.

Considerable difficulty is still being experienced in obtaining plant and material, but steady progress is being maintained, and it is anticipated that the airport will be ready for use by the end of 1951.

The size of Heathrow, the new London airport now under construction near Hounslow, which is expected to cost £25,000,000, makes an interesting comparison with South Africa's international terminal.

There is actually little difference between Heathrow, which is already in service, although as yet incomplete,

and the plans for the Union's main airport, which is still in the early stages of construction, but the British Ministry of Civil Aviation has now decided to treble the size of Heathrow, and if the scheme is approved by Parliament, the London airport will eventually be the finest in Europe.

Heathrow's primary runway is 3,000 yards long and 100 yards wide, which is 500 yards shorter than the main runway of the Transvaal airport, which, situated nearly 6,000 feet above sea level, requires a longer runway to counteract the effect of the higher altitude.

Heathrow's two secondary runways, which have not yet been completed, will be 2,000 yards long, and like the main runway 300 feet wide. The three runways will all be capable of supporting an all-up weight of 360,000 lb. which means the heaviest aircraft likely to be made in the immediate future can be carried safely.

The two secondary runways in the Transvaal will be 2,750 yards long, or 750 yards longer than the second and third runways at the British aerodrome, they will be 200 feet wide, but being flanked on both sides by gravel shoulders each 50 feet wide, they will in practice be virtually as wide as the Heathrow runways. All the South African runways will also support an all-up weight of 360,000 lb.

The Union's main airport will cover 3,776 acres as against Heathrow's 1,500 acres, but the British airport will occupy more than 4,000 acres under the new scheme. Both aerodromes will provide ample room for future extensions. Idlewild, New York's new airport will cover 4,600 acres, and when it is finally completed in 1954, it will have 12 runways and a terminal building big enough to house the offices of all the American and a number of foreign airlines.

Heathrow will have 1,114,000 square yards of concrete surface as against 1,035,000 square yards, including heavy duty tarmac, for the Union's airport.

At Heathrow 120 acres of ponds and gravel pits have been filled in, more than 100,000,000 gallons of water have been drained out, and 2,000,000 cubic yards of earth and gravel have been excavated as well as 500,000 cubic yards of silt. The construction of the airport in the Union will involve 3,800,000 cubic yards of earthworks and the removal of 700 acres of plantation.

Photograph: S.A.R. & H.

BRICK MAKING.

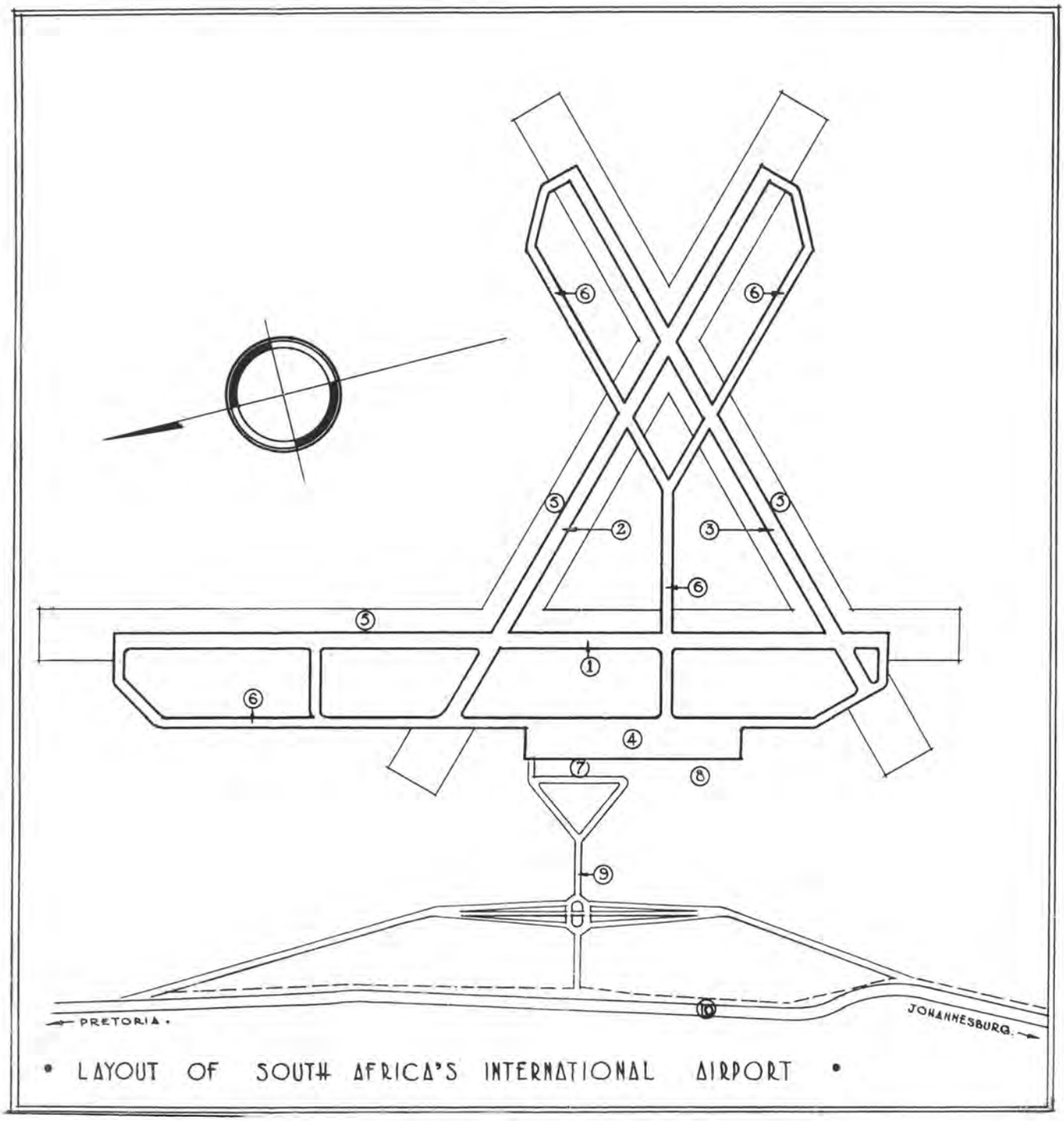
Photograph: S.A.R. & H.

ELEVATING GRADER ON RUNWAYS.

Photograph: S.A.R. & H.

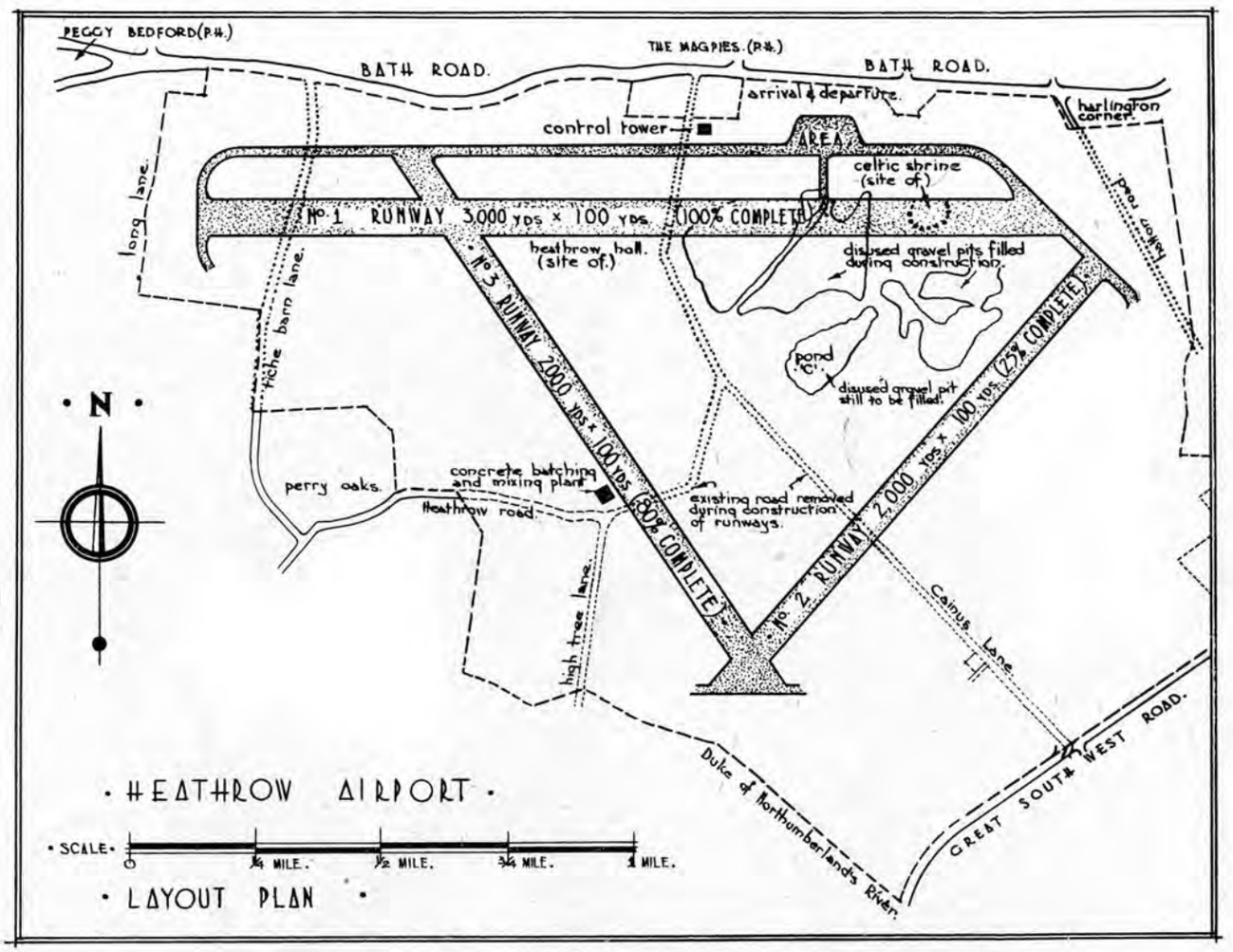
SOIL TESTING.

" TOURNAPULL " IN BACKGROUND.



• LAYOUT OF SOUTH AFRICA'S INTERNATIONAL AIRPORT •

1. Primary runways — 3,500 yards long.
2. } Secondary runways — each 2,750 yards long.
3. }
4. Arrival and departure apron.
5. Gravel shoulders of runways.
6. Taxiways.
7. } Location of terminal buildings and hangars.
8. }
9. Airport. Road.
10. Johannesburg-Pretoria Railway line. (Kempton Park station is approximately one mile north of airport.)



COMPARATIVE SIZES OF AIRPORTS.

Airport.	*Overall Size. Acres.*	*Primary Runway. Yards.*	*Secondary Runway. Yards.*	*Width of Runways. Feet.*	*Concrete Surface. Yards.*
South Africa	3,776	3,500	2,750	300 (main)	1,035,000
Heathrow (Great Britain)	1,500	3,000	2,000	300	1,114,000
Heathrow (new proposals)	4,000	5,000	3,000	300	—
Idlewild (New York)	4,600	3,300	2,300	200	—

PALMIETFONTEIN

SOUTH AFRICA'S TEMPORARY INTERNATIONAL AIR TERMINAL

RAILWAY BULLETIN

Photograph: S.A.R. & H.

OVERSEAS TRAVELLERS' LOUNGE, PALMIETFONTEIN.

ALTHOUGH the Palmietfontein Airport — now serving as South Africa's international landing ground — is only a temporary expedient, the South African Railways have been forced by circumstances to equip it with a wide range of modern facilities in order to give adequate service to the aircraft of the many nations which have added South Africa to their schedules. Constellations, Skymasters, Avro-Yorks and an occasional D.C.6 arrive at and depart from Palmietfontein in ever-increasing numbers. All these aircraft require first class service, and £260,000 has already been spent on Palmietfontein, which will serve as the Union's international airport until the Jan Smuts Airfield, midway between Johannesburg and Pretoria, is completed.

From a bare stretch of veld with a single hardened runway and a small shack for officials and passengers, Palmietfontein has grown within the past two years into a busy port of entry equipped to meet all demands of international services and operating continuously throughout the twenty-four hours.

Photograph : S.A.R. & H.

RESTAURANT, PALMIETFONTEIN.

Initially, all large air liners landing at Palmietfontein had to discharge their passengers and then fly to the Rand Airport for servicing and maintenance. For this flight only the barest minimum of fuel and passengers could be carried, as the length of the runways at the Rand Airport was insufficient to accommodate fully loaded aircraft of the Skymaster (D.C.4) class. Besides being extremely inconvenient, servicing at Germiston entailed regular non-revenue earning flights, and it was, therefore, not long before servicing hangars were erected at Palmietfontein.

At the present time there are two double Bellman hangars, each 130 feet wide by 250 feet deep, in addition to a third hangar devoted to the housing of aircraft spares and stores. The two main hangars are each capable of accommodating four Avro Yorks or three Skymasters. The hangars are electrically lit and are equipped with the necessary plant to permit of all South African Airways and B.O.A.C. aircraft being serviced on the spot. With the arrival of three additional Skymasters and the first of eight Vickers Vikings, all of which will operate from Palmietfontein, consideration is being given to the erection of further hangars.

FLYING FACILITIES

Situated at an altitude of 5,100 feet above sea level and just over twelve miles from Johannesburg, Palmietfontein occupies an area of approximately 750 acres of flat grassland, free from flying obstructions, and providing easy approach from all directions. It has two hardened runways, each constructed of water-bound macadam 10 inches thick and capable of withstanding a wheel load of 50,000 lb. These all-weather runways are in the form of a "V," with the main runway running north to south and the auxiliary north-east to south-west. The main runway is 6,000 feet long and the auxiliary 4,800 feet. Both have a width of 150 feet.

Parallel to these runways, either of which is capable of accommodating the largest aircraft operating international services to-day, are two turf runways of the same length, while a third runway, 5,000 feet long, runs from east to west. These turf runways serve as emergency landing areas and are capable of accommodating most aircraft during the dry season.

The airport is equipped with Standard Beam Approach, blind-landing equipment, a tele-communication system and night-landing facilities in the form of a flare path. Contact lights and approach lighting are on order and will be installed as soon as the equipment is received. There is no meteorological station on the airport, but all meteorological reports and readings are obtained from the station at the Rand Airport, six miles to the north. Palmietfontein airport is equipped with direction-finding apparatus, flying control and the usual fire tender service, operated by the Civil Air Council, while a control tower, some 30 feet high, affords control officers an excellent view of the entire airport. A large tarmac apron fronts upon the main building, with a tarmac taxiway to the runways, while the hardstandings for the running-up of engines are floodlit.

PASSENGER FACILITIES

With between 3,000 and 4,000 passengers arriving or departing every month, Palmietfontein has become a busy rendezvous for world travellers, and facilities for the handling and clearing of baggage and dealing with Customs, immigration and health formalities have been substantially developed, with the result that departures and arrivals are dealt with as expeditiously as anywhere in the world.

Owing to the more elaborate formalities required in respect of passengers flying on international services, special accommodation has been set aside solely for overseas travellers, who have at their disposal a large tastefully furnished lounge capable of accommodating nearly fifty persons, where they can rest and be served with refreshments while awaiting the clearance of their baggage. Between this lounge and the main concourse are the Immigration and Customs offices.

From the main concourse, in the corner of which is a bookstall, where periodicals, sweets and cigarettes can be obtained, passengers on internal services pass into their own special lounge, complete with a comfortable restaurant overlooking the flying field. Meals can be obtained at all times. A continuous catering service operates throughout the twenty-four hours for the victualling of aircraft and the provision of meals and refreshments to passengers. The lounge and dining room together accommodate nearly 100 persons.

A public address system keeps all passengers and visitors advised of the arrival and departure of aircraft and during week-ends and public holidays sightseers congregate at the airport to watch the flying activities.

BID TO RAISE STANDARD OF S.A. TIMBER

A PROGRAMME designed to bring up the standard of South African timber, particularly soft-woods, to equal that of the best imported timber has been embarked on by the South African Lumber Millers' and Shook Manufacturers' Association. Working in close co-operation with the South African Bureau of Standards, it has formulated a satisfactory set of standard specifications.

As part of the programme, the association recently appointed Dr. J. W. Bowen its official research and propaganda officer.

Dr. Bowen is an Australian, who took his M.Sc. degree at Melbourne University. After his arrival in the Union he took his D.Sc. at Stellenbosch. He is an expert in wood technology and practical saw-milling, and is conversant with forestry practice overseas as well as in the Union and adjacent territories. Since his appointment Dr. Bowen has begun a tour of all sawmills and timber centres in the Union, with the object of investigating conditions.

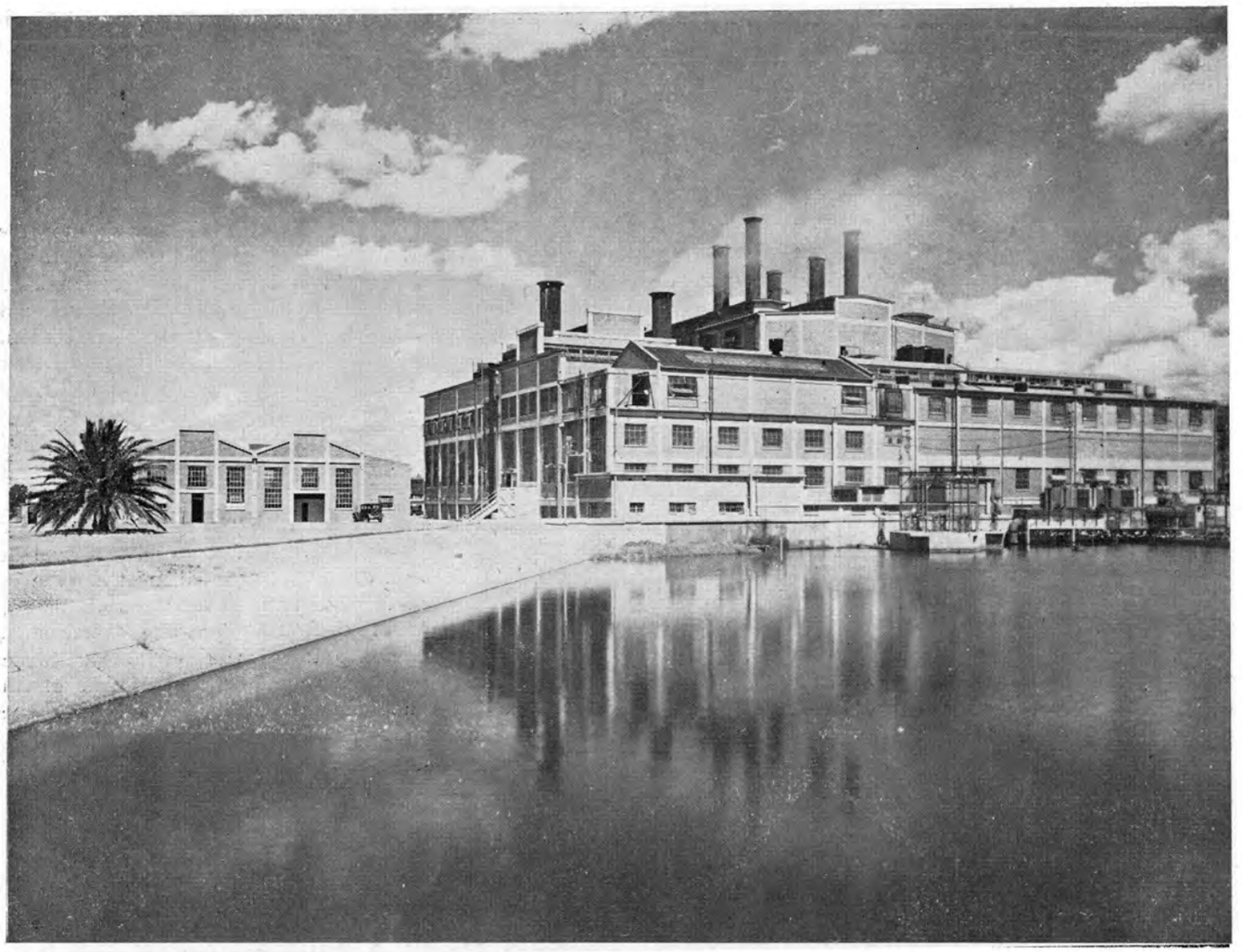
EFFECTS OF WAR

In common with other industries, the timber industry in South Africa had, during the war, to provide the maximum output for the war effort without paying the customary attention to quality. The result was that the reputation of locally-produced timber suffered considerably.

In recent months the timber market in the Union has been swamped with imported timber, a great deal of it from eastern Canada. It is stated that not only is that glut an artificial one, but the quality of much of the overseas timber is much lower than that of the local product.

Britain has announced a drastic cut of 200,000 standards of timber in its annual importation programme, and South Africa's ability to pay for supplies of timber has been responsible for the deluge of imports.

Unless the quality of imported timber improves considerably, timber merchants are expected to cut down their overseas orders, thus throwing a greater responsibility on the local industry, and making the maintenance of high quality even more important.



Photograph: City Council of Pretoria.

EXISTING POWER STATION, PRETORIA.

PRETORIA POWER STATION DEVELOPMENT

BY THE PUBLIC RELATIONS OFFICER, CITY COUNCIL OF PRETORIA

WORK on Pretoria's new municipal Power Station has begun and it is estimated that to complete this major project will cost between £6,000,000 and £7,000,000, the biggest amount so far spent by the Pretoria City Council on any single item of municipal service in the history of the capital. This is not surprising, for when completed the existing and new Power Stations will, in addition to the municipal area, have to supply electricity to a rural area bigger than that supplied with electricity by any other local authority.

The new Power Station will be built on the south side of the present station, off Mitchell Street and not far from Iscor, in Pretoria West.

The ultimate capacity of the new station will be 180,000 Kilowatts, which will be about double the capacity of the present station when this has been completed by the addition of two new generators. These have been on order since 1941 and will be delivered towards the end of this year and early next year. The first has been shipped from Britain. The auxiliary plant is being erected in the meantime.

For the new station, which will have as one of its features a central vacuum cleaning plant, three additional cooling towers will be erected. The size will be the same as the existing one, and when complete 10,000,000 gallons will be cooled per hour.

This volume is equal to approximately two-thirds of Pretoria's daily consumption of water for all purposes. The water is, however, used over and over again, the only loss being that due to evaporation by virtue of which the cooling of the water is achieved. When the Power Station is complete the loss will be made up by sewage effluent which will be pumped to the Power Station from the sewage disposal works. The loss of water due to evaporation will, when the station is complete, be equal to about 2,500,000 gallons per day, equal to about one half of the total daily sewage effluent at present. The effluent will, of course, increase as the city grows and by the time this system comes into operation, the daily quantity of water taken from the sewage works will represent a much lower percentage of the total effluent.

The new station will contain ten boilers, each of which will have a maximum output of 210,000 lbs. of steam per hour, a total hourly output of 2,100,000 lbs. of steam. The first four boilers have been ordered from Messrs. Yarrow and Co., Ltd., Glasgow, at a cost exceeding £1,000,000. These boilers are more than twice the size of the biggest boiler in the present station.

The boilers will generate steam at 650 lbs. per square inch pressure and at a temperature of 875 degrees Fahrenheit. The pipes used for conveying steam from the boilers to the turbines will be 14 inches in diameter; they are chrome-molybdenum alloy steel pipes specially made to stand high temperature and pressure.

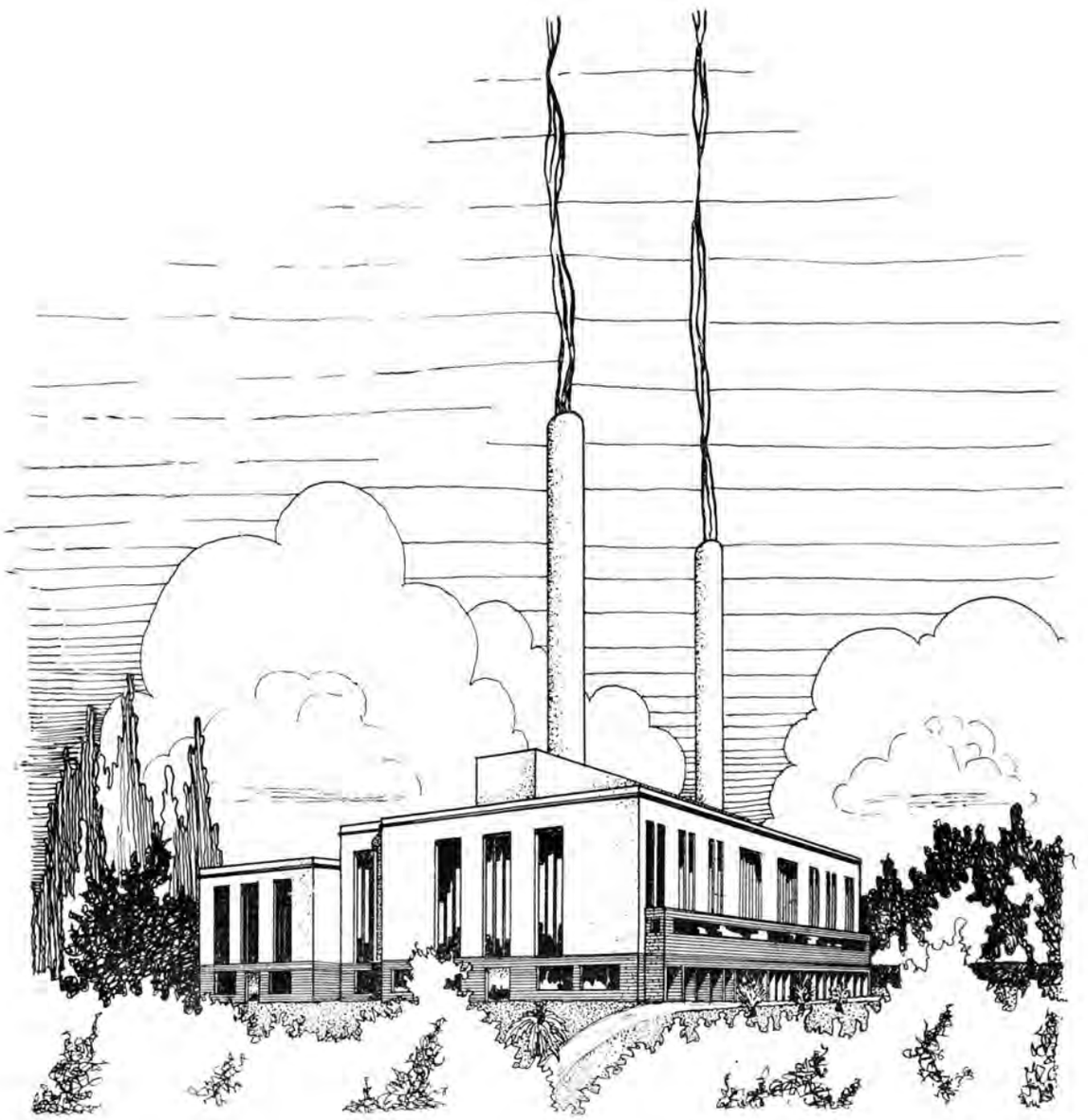
Modern dust-collecting plant will be a feature of these boilers which will probably be the first of a new design to be manufactured by the suppliers, Messrs. Davidson and Co., Ltd., of Belfast, Northern Ireland. Pretoria will reap a corresponding benefit from the use of this modern plant because, without greatly increasing the cost, the dust nuisance will be reduced to a minimum.

The completed station will contain six turbo-alternators, each with an output of 30,000 kw. Two of these have been ordered from the English Electric Co., at a cost of approximately £350,000. The size of these turbo-alternators will be twice that of the largest installed in the existing Power Station.

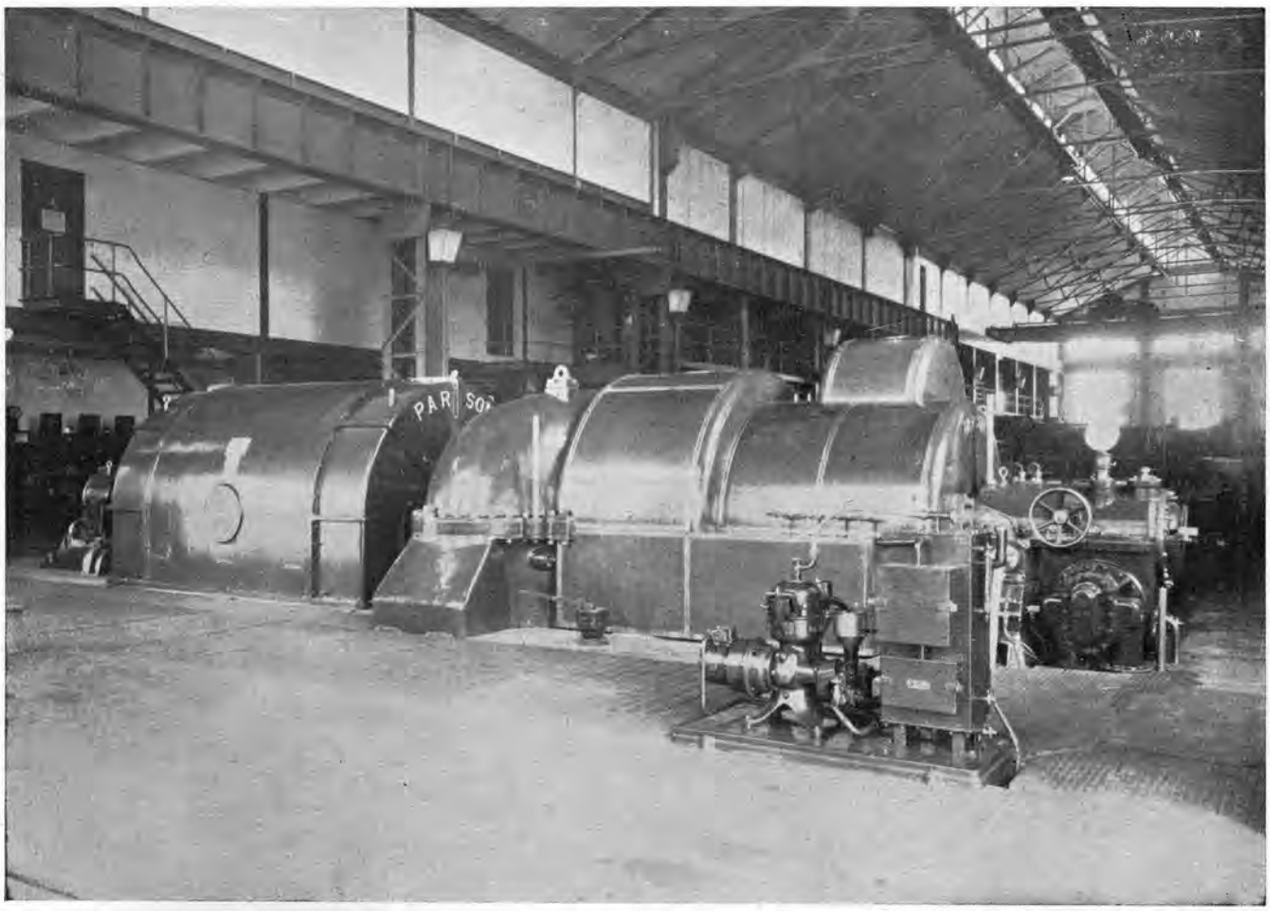
The new alternators will generate electricity at 11,000 volts and this will be stepped up to 33,000 volts for distribution in the City. This means that 33,000 volt switchgear and cable system are already being provided for urban distribution of electricity.

New coal bunkers will be constructed on the north side of Mitchell Street on the present ash dump. The railway lines to these bunkers will cross Mitchell Street and a shallow subway will be constructed underneath the railway lines. Arrangements are being made to terrace the ground between the present Power Station and Church Street West. Once completed, this site will be used for sports grounds.

The contracts for boilers and turbo-alternators were placed last year. Early this year tenders were invited for 180,000 lbs. and 27,000 lbs. overhead electric travelling cranes, and the order for these cranes has been placed with Messrs. Babcock and Wilcox, Ltd., of Glasgow, at a total cost of £198,000. Messrs. A. Reyrolle and Co., will supply the 33,000 volt and other switchgear for the new Power Station at a cost of nearly £250,000. The Consulting Engineers for the project are Messrs. Merz and McLellan, of London, and Messrs. Kanthack and Partners, of Johannesburg.



SKETCH OF NEW POWER STATION.



Photograph: City Council of Pretoria.

LATEST TURBO-ALTERNATOR, INSTALLED 1940.

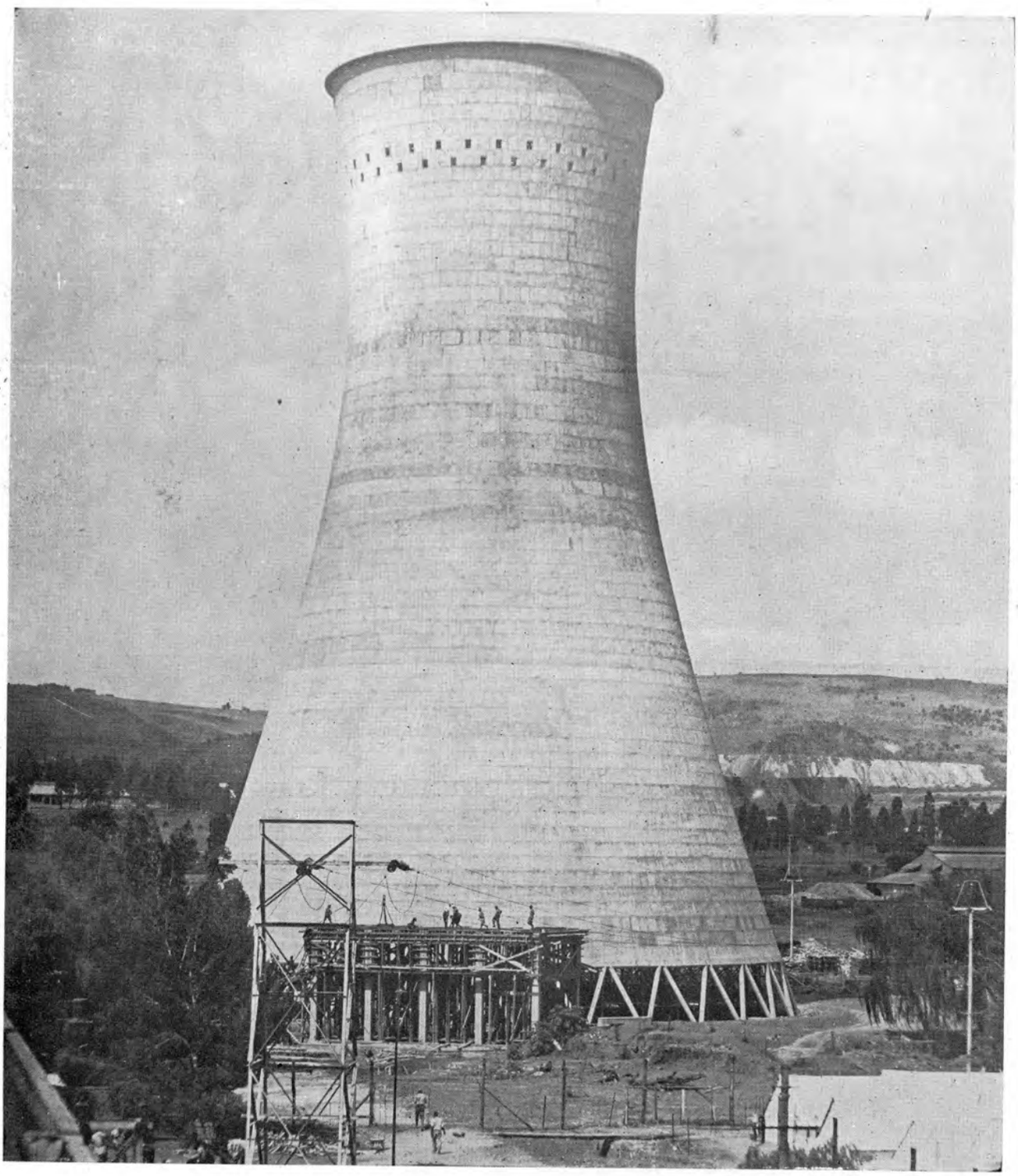
Tenders are now being invited for the supply of piping, circulating water pumps and equipment. These tenders close this month.

This new Power Station was planned, and had become necessary, even before the war, but owing to the war it was not possible to proceed with this work. Now, however, the planning has gone beyond the blue print stage and tenders have been called for the excavation and construction of the foundations. At present boring is being carried out with a diamond drill at a cost of 25s. per foot to ascertain the nature of the rock strata below the site for the new Power Station in order to ascertain to what depths the foundations must be carried.

These contracts are for the first stage of the new Power Station and the total expenditure on this stage is estimated at just over £3,000,000.

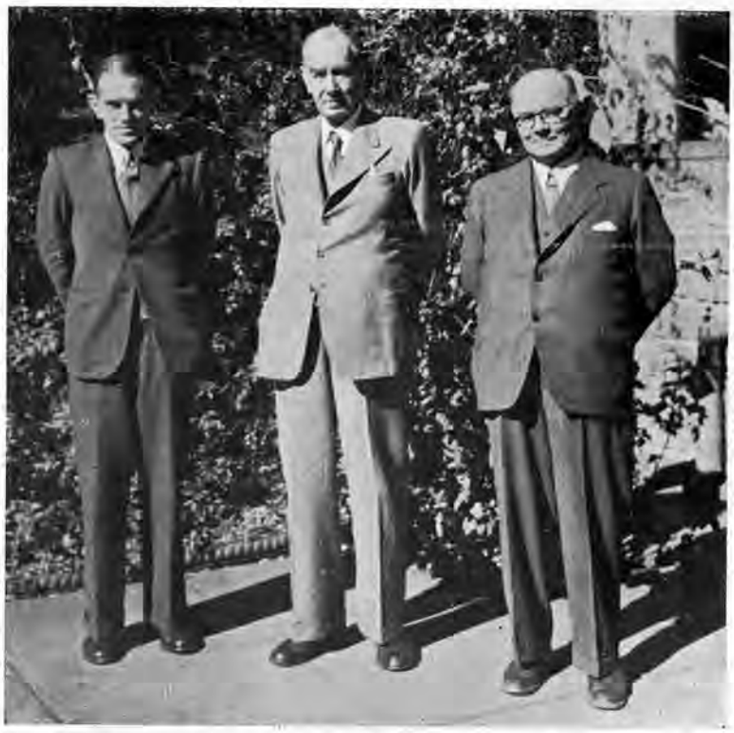
The second and succeeding stages will cost an equal amount, so that the construction of the new Power Station when completed will involve an expenditure of between £6,000,000 and £7,000,000. The plans, however, are such that further extensions of the new Power Station can be adjusted to meet the increase in load due to the expansion, industrial and otherwise, of the supply area. This area, under a licence granted recently by the Electricity Supply Control Board, is approximately 1,500 square miles in extent, being the area, with the exception of Premier Mine, within a radius of 25 miles from Church Square, the centre of the city. This is the biggest area supplied with electricity by any local authority in South Africa.

The first and direct obligation of the Pretoria Municipal Electricity Department is, of course, in the first instance to supply the urban municipal area. This it has always done most efficiently and at a tariff which, particularly for business and industrial use, compares favourably with that charged by any other body supplying electricity. The demand for electricity in the Pretoria peri-urban area has always been such that, for many years now, the department has also supplied a vast rural area in the vicinity of Pretoria, and to-day it already furnishes several other local



Photograph: City Council of Pretoria.

The cooling tower at the Pretoria municipal Power Station, 260 feet high with a diameter of 184 feet at the base. This tower was constructed to cool 2,500,000 gallons of water per hour. Three similar towers are to be built as part of the new Power Station, making the total cooling capacity of the four towers 10 million gallons per hour.



D. J. HUGO. T. C. WOLLEY DOD. L. L. HORREL.

THREE GENERATIONS OF CITY ELECTRICAL ENGINEERS.

authorities, including Brits (about 25 miles west of Pretoria), with a bulk supply of electricity. It has at present nine major schemes under consideration for increasing its area of supply, and the capital expenditure involved in these schemes will probably exceed £500,000. Shortage of equipment is, however, a delaying factor and it will probably take two to three years before all the demands of most consumers living in these areas can be met.

The service it provides to the citizens of Pretoria is one of the most popular of municipal services, one of the reasons for this popularity being the reasonable charges made for electricity. This was proved again recently when the City Council re-introduced a scheme which was in operation before the war of lending money to municipal ratepayers for buying certain specified electric appliances on a five-year loan with interest at the rate of five per cent. The City Council had previously obtained permission from the Administrator to borrow an amount of £200,000 for this scheme. As soon as it was announced that this scheme was in operation the City Treasurer's office, which handles the applications, was swamped out by applicants, and it appeared as if the amount set aside for this purpose would be quite inadequate. As it is an economic scheme, however, and as the City Council loses no money on it, it is expected that there will be no difficulty in making additional funds available for the scheme.

Though only half as old as Pretoria (which will celebrate its centenary in 1955) the Electricity Department has, like other municipal departments, kept abreast of the development of the city. Only once did it have to ask for assistance — through no fault of its own. That was during the war when the building of the new Power Station was held up. Fortunately the Victoria Falls Power Co., was in a position to come to its assistance, and is to-day still helping the department to meet the ever-growing demand for electricity.

In one respect this department is unique in South Africa. That is that since it was established under a Republican concession over fifty years ago, it has had only three electrical engineers, all three of whom are still alive to-day.

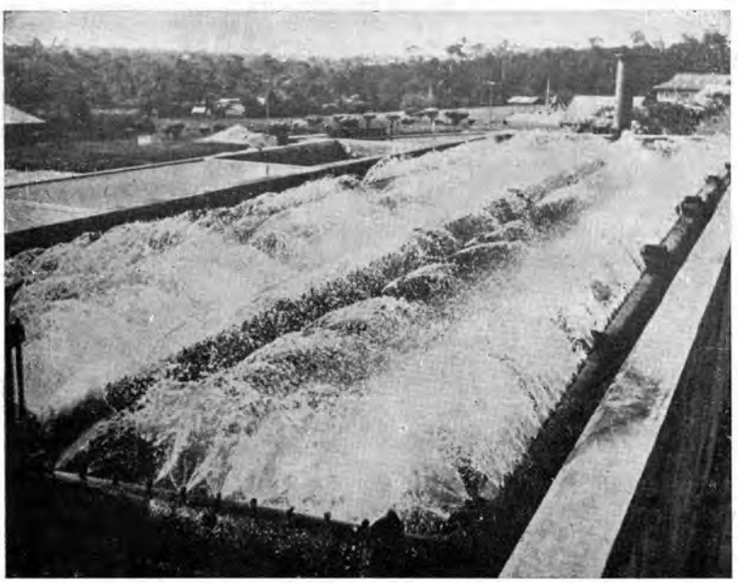
They are Mr. T. C. Wolley Dod, who was the manager of the Pretoria Lighting Co., the Republican forerunner of the Electricity Department. When this company was taken over by the Municipality after the South African War, he joined the municipal service and remained in charge of the department until 1928 when he retired on pension. He was succeeded by Mr. L. L. Horrell, who was City Electrical Engineer up to 1938 when he was succeeded by the present City Electrical Engineer, Mr. D. J. Hugo, who is the "father" and "pilot" of the present major expansion of the department, the biggest in the department's history covering the past half century.

LAGOS WATER SUPPLY.

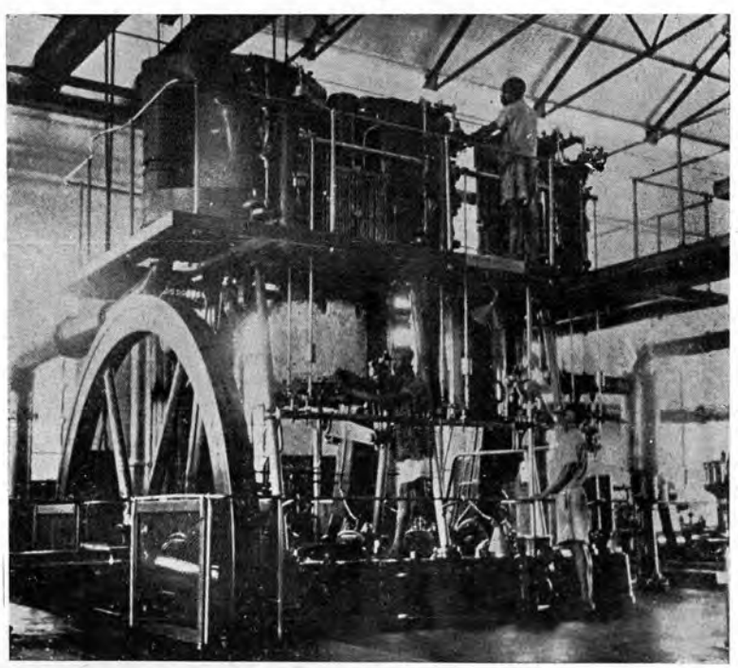
(Photographs by West African Photographic Service).

FILTERS.

AERATOR.



LOW LIFT PUMPS.



LAGOS WATER SUPPLY NIGERIA

THE supply of water to the public in Lagos was first turned on in 1914, construction having commenced about 1911. The cost of the works was in the region of £300,000.

The supply is obtained from the Iju River, which is a perennial stream and which has consistently met all demands on it until this year, when due to the abnormally dry wet season of 1946, the flow has been below 5 million gallons per day, barely sufficient to meet the present day demand of approximately 4,500,000 gallons.

Raw river water is drawn from the stream and pumped by the low lift pumps to the aerator, from which it passes under the chemical treatment house, where the necessary chemicals are added. Daily tests are conducted to ascertain the correct quantity of chemicals that must be added to ensure that the treatment is effective.

The water then passes through the settling tanks, where the heavier impurities are removed, and then passes to the filters, of which there are eight in all. These filters do the final clarification and purification. Periodically each filter has to be cleaned, the frequency of this operation depending on the condition of the water, which varies with the seasons. Cleaning merely consists of scraping off ½" of sand which has collected the impurities in the water. Flow through the filters is fairly closely regulated, as on this depends their efficiency.

After filtration the water receives a small dose of chlorine as a final safeguard, and is then pumped by high lift pumps to a service reservoir of 6 million gallons capacity, from which Lagos is supplied.

All pumps are steam driven, steam being supplied from four boilers using Nigerian coal, but it is now necessary to instal new plant, and for this electricity will be the motive power. A new cable has been laid from Lagos and new switchgear has been installed, preparatory to the arrival of the new pumps. When the improvements and additions are complete, Iju Waterworks, will be capable of supplying nearly 10,000,000 gallons of pure water daily.

By Asst. Director of Public Works (Water), Lagos, Nigeria.

TENDERS INVITED

THE 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.

Note: S.A.R. & H. Tender Board address is: 715, P.F.A.C. Building, 15, de Villiers St., Johannesburg.

BUILDINGS:

Stellenbosch: Cape Provincial Tender Board, Provincial Building, Cape Town. Erection of additional class rooms, store room, lavatory blocks, etc., in connection with the Kuils River Secondary School, in the Stellenbosch Division. Architect: S. R. Immelman, 63, St. George's Street, Cape Town. Due, 4/11/47.

SHIPPING, ETC.:

S.A.R. & H. Tender Board: Two oil-burning tugs. No. 7098. Due, 6/11/47.

STRUCTURAL STEEL, ETC.:

East London Municipality: Supply, delivery and erection of the structural steel work to the roof of the proposed extension to the Municipal Bus Depot. Stores Controller & Buyer, East London. Due, 5/11/47.

Southern Rhodesia Government Tender Board, Salisbury: 60 short tons of 12 and 14 I.S.W. chilled steel sheet. No. 1508. Director of Irrigation, Salisbury. Due, 17/11/47.

S.A.R. & H. Tender Board: Structural steel work. No. 7272. Due, 13/11/47.

VEHICLES, ETC.:

Natal Provincial Tender Board: P.O. Box 358, Pietermaritzburg. 3-ton truck chassis. No. 63/47. Provincial Roads Engineer. Due, 26/11/47.

Natal Provincial Tender Board: 2½ cubic yard truck tipping bodies. No. 64/47. Due, 26/11/47.

S.A.R. & H. Tender Board: Passenger Bus Chassis. No. 7055. Due, 13/11/47.

S.A.R. & H. Tender Board: Electric motor coaches. No. 6116. Due, 25/3/48.

Bloemfontein Municipality: One 5-ton tip truck for use on road construction. Due, 11/11/47.

Johannesburg Municipality: Stores Dept. Motor Vehicles. Due, 10/11/47.

TRACTORS AND EARTH MOVING PLANT, ETC.:

S.A.R. & H. Tender Board: Industrial tractors. No. 7114. Due, 13/11/47.

S.A.R. & H. Tender Board: Industrial tractors. No. 7150. Due, 18/12/47.

S.A.R. & H. Tender Board: Caravan trailers. No. 7153. Due, 11/12/47.

S.A.R. & H. Tender Board: Air compressors. No. 7105. Due, 11/12/47.

Natal Provincial Tender Board: P.O. Box 358, Pietermaritzburg. Crushing outfits. 65/47. Due, 26/11/47.

Irrigation Department: P.O. Box 277, Pretoria. Drag line excavators. Irr. No. 132. Due, 11/12/47.

CRANES, ETC.:

S.A.R. & H. Tender Board: Cranes. No. 6888. Due, 20/11/47.

WATER SUPPLIES, PIPING, ETC.:

Durban: City and Water Engineer. Pipes and Specials for Cave Rock Bight Sand Pumping Scheme. B. 1556. Due, 28/11/47.

Bulawayo Municipality: N'cema Extension No. 2. Pumps, motors, pipe work, overhead cranes, necessary fitting and switch gear. Contract 3/1947. Town Clerk, Bulawayo. Further extended, 1/11/47.

Bulawayo Municipality: N'cema water works extension No. 2. Supply, delivery and erection of filter plant, pipes, fittings, sundry water works accessories, etc. (Deposit of £5. 5s. — extra copies of documents at £3. 3s. each.) Contract 16/1947. Town Clerk, Bulawayo. Due, 24/11/47.

Somerset East Municipality: Augmentation of water supply. Supply, delivery and installation of bore hole pumping plant. (Deposit of £10.) Contract 21/1947. Consulting Engineer: Ninham Shand, 806, Groote Kerk Bldgs., Parliament Street,, Cape Town. Due, 29/11/47.

George Municipality: Water scheme. Pipes, valves and fittings. (Deposit of £2. 2s.) Contract 12/1947. Consulting Engineer: Ninham Shand, 806, Groote Kerk Bldg., Cape Town. Due, 29/11/47.

Public Works Department, Maseru, Basutoland: Augmentation of water supply. The laying of pipes and the construction of water purification works and reservoirs. (Deposit of £10.) Contract 7/1947. Consulting Engineer: Ninham Shand, 806, Groote Kerk Bldg., Cape Town. Due, 29/11/47.

Irrigation Department: P.O. Box 277, Pretoria. Overhead sprays to irrigation plants. Irr. No. 141. Due, 6//11/47.

Johannesburg Municipality: Stores Dept. Centrifugal pumps. Contract 251. Due, 10/11/47.

S.A.R. & H. Tender Board: Sinking and lining of bore holes at Wondergeluk, Weenen, Chieveley, de Jagersdrif, Kingsley and Signal Hill. (Deposit of £1. 1s.) Due, 6/11/47.

S.A.R. & H. Tender Board: Work in connection with the Coerney Water Supply, as follows: Composite earth fill and concrete gravity dam; 450,000 gallon reservoir; 100,000 gallon tank; pipe line; pump house; valve tower and house; House, type P.95/2 etc. (Deposit of £5.) Due, 6/11/47.

ELECTRICAL EQUIPMENT, ETC.:

S.A.R. & H. Tender Board: Transmission line equipment. No. 7344. Due, 11/12/47.

S.A.R. & H. Tender Board: Switch boards and transformers. No. 7228. Due, 11/12/47.

S.A.R. & H. Tender Board: Marine radio equipment. No. 7312. Due, 11/12/47.

S.A.R. & H. Tender Board: Electrical testing instruments. No. 7311. Due, 8/1/48.

S.A.R. & H. Tender Board: Copper wire. No. 7196. Due, 6/11/47.

S.A.R. & H. Tender Board: Telegraph line material. No. 7140. Due, 13/11/47.

Salisbury Municipality: Electric meters. S.5/48. Stores Department, Salisbury. Due, 4/11/47.

Salisbury Municipality: Electricity Department. Apparatus for remote control of water heaters, street lighting, etc. E 64 . Due, 4/11/47.

Cape Town, City Electrical Engineer:

(a) Overhead line material. Specification No. 1435/1947. Due, 5/11/47.

(b) Electric lamps. Specification No. 1437/1947. Due, 5/11/47.

(c) Hard drawn bare copper and annealed hard drawn varnished cambric insulated copper conductors. Specification No. 1436/1947. Due, 6/11/47.

(d) Porcelain weatherproof pole fuse units for consumers' connections. Specification No. 1439/1947. Due, 7/11/47.

(e) Iron-clad multi-hole connection blocks. Specification No. 1440/1947. Due, 7/11/47.

Note: Separate tenders in respect of each specification.

Department of Public Works, Pretoria: Two Diesel alternator sets. Poleta Health Centre. P.W.D. 891. Due, 20/11/47.

Department of Public Works, Pretoria: Low tension switch gear for various institutions in Pretoria. P.W.D. 892. Due, 20/11/47.

Department of Public Works, Pretoria: Three reciprocating steam engine-driven alternators. Nelspruit Sanatorium. P.W.D. 893. Due, 20/11/47.

Department of Public Works, Pretoria : One 100 K.v.a. transformer, State Library, Pretoria. P.W.D. 915. Due, 6/11/47.

Department of Public Works, Pretoria : Supply, delivery and erection of one electric passenger-goods lift, New Automatic Telephone Exchange, Port Elizabeth. P.W.D. 916. Due, 18/12/47.

Johannesburg Municipality : Stores Dept. Circuit breakers and fluorescent light fittings. Contract No. 192. Due, 10/11/47.

Johannesburg Municipality : Electric lamps. Contract 255. Stores Department, Johannesburg. Due, 10/11/47.

Johannesburg Municipality : 88 k.v. overhead transmission lines. Contract D.5/47. Electricity Dept., Johannesburg. Extended, now due. 12/11/47.

Electricity Department, Durban : Electrical material (street light fittings and link switches). No. E. 2137. Due, 14/11/47.

Electricity Department, Durban : Electric cable. E. 2140. Due, 21/11/47.

Electricity Department, Durban : Oil filter plant. E. 2139. Due, 5/12/47.

Electricity Department, Durban : Metering equipment. E. 2138. Due, 5/12/47.

Electricity Department, Durban : Workshop machines : Lathes and arc welding set. E. 2140. Due, 19/12/47.

Electricity Department, Durban : Transformers. E. 2142. Due, 9/1/48.

Department of Posts and Telegraphs, Pretoria : Telephone switch board wire. No. P.O. 834. Due, 6/11/47.

Department of Posts and Telegraphs, Pretoria : Amplifier sets for telephones, detectors and portable telephones. P.O. 861. Due, 13/11/47.

Department of Posts and Telegraphs, Pretoria : Metal rectifiers, automatic charging rectifiers and full wave metal rectifier units. P.O. 863. Due, 20/11/47.

Department of Posts and Telegraphs, Pretoria : Terminal and distribution boxes and lightning protectors. P.O. 864. Due, 27/11/47.

Department of Posts and Telegraphs, Pretoria : Magneto extension bells, trembler bells, switches and extra receivers for telephones. P.O. 845. Due, 6/11/47.

Department of Posts and Telegraphs, Pretoria : Lacing twine. P.O. 848. Due, 6/11/47.

Bloemfontein Municipality : E. H. T. cable. Enquiry 28/1947. City Electrical Engineer, Bloemfontein. Due, 6/11/47.

Bloemfontein Municipality : Overhead line material. Enquiry 30/1947. City Electrical Engineer, Bloemfontein. Due, 26/11/47.

Bloemfontein Municipality : Copper and/or aluminium conductor. Enquiry 29/1947. City Electrical Engineer, Bloemfontein. Due, 6/11/47.

Vereeniging Municipality : Electricity distribution extensions: Section 1, H.T. and L.T. cable and boxes; Section 2, H.T. and L.T. switch gear; Section 3, Transformers; Section 4, Earthing compensator and resistance; Section 5, Steel poles, copper and sundries. (Deposit of £3. 3s. — extra copies of documents at £1. 1s. each.) Specification V. 2/47. Consulting Engineer : J. S. Clinton, P.O. Box 4648, Johannesburg. Due, 5/12/47.

Pretoria Municipality : Power Station " B ", first stage. Supply delivery and erection of :

(a) Piping and equipment for power station. Form of tender : N. 650.

(b) Circulating water pumps and equipment. Form of tender : N. 644.

Information from City Electrical Engineer, Pretoria or Consulting Electrical Engineers, Merz and McLellan, Carloil House, Newcastle-on-Tyne, England.

Deposit £2. 2s. each. Closes, 11/11/47.

Nelspruit Municipality : Extensions to electricity undertaking : 350 k.w. oil engine generating plant and equipment. Contract 1/1947. Town Clerk, Nelspruit. Extended to 12/11/47.

Graaff-Reinet Municipality : Supply, delivery and erection where specified of the power plant and distribution material covered by the following :

10,000 lb. per hour boiler, feed pump, steam, feed and drain piping. Specification G.R. 2/1947.

625 k.w. turbo-alternator and evaporator plant. G.R. 3/1947.

H.T. and L.T. switch gear, P.S. Aux. transformer. G.R. 4/1947.

Circulating water pump, motor, spray gear and pipe work. G.R. 5/1947.

Switch gear, H.T. cable, cable boxes, L.T. cable, cable boxes, switch gear, transformers and sundries. G.R. 6/1947.

(One copy of the documents for any one of the above contracts on deposit of £3. 3s. — additional copies at £1. each.) Consulting Engineer : J. S. Clinton, P.O. Box 4648, Johannesburg. Due, 20/12/47.

Bulawayo Municipality : First extension, 13th Avenue Power Station : Supply, delivery and erection of steam boilers, turbo-alternator, switch gear, feed pumps, steam and water piping, tanks, transformers, reactors and certain other auxiliary equipment. (Three copies of contract documents on deposit of £5. 5s. — extra copies at £2. 2s. each.) Contract E. 26/47. Town Clerk, Bulawayo. Due, 19/1/48.

Port Elizabeth Municipality : Supply, delivery and erection of super tension overhead transmission line. (Duplicate copies of documents on deposit of £1. 1s. — extra copies at 10s. 6d. each.) Specification 305. City Electrical Engineer, Port Elizabeth. Due, 27/11/47.

Port Elizabeth Municipality : Super tension E.H.T. and L.T. cable, joint boxes, etc. Specification 307. City Electrical Engineer, Port Elizabeth. Due, 27/11/47.

Roodepoort-Maraisburg Municipality :

Section A. H.T. switch gear.

Section B. L.T. switch gear.

TENDERS INVITED

(CONTINUED)

Section C. Street light control apparatus.
Section D. Transformers.
Section E. Cable.
(One set of contract documents on deposit of £1 — extra copies at 5s. each.) Contract F. 4/28. Electrical Engineer, Roodepoort-Maraisburg. Due, 17/11/47.

Pietersburg Municipality: Electricity extensions. Town Clerk, Pietersburg. Extended to 3/11/47.

Broken Hill Town Management Board: Sundry electricity distribution material and erection thereof. Specification B.H. 1/1947. Consulting Engineer: J. S. Clinton, P.O. Box 4648, Johannesburg. Due, 15/11/47.

Natal Provincial Tender Board: P.O. Box 358, Pietermaritzburg. Melting pots for white metal (electric). No. 66/47. Due, 26/11/47.

MISCELLANEOUS:

Anaesthetic machines for country hospitals: No. 6 required. Natal Provincial Tender Board, P.O. Box, 358, Pietermaritzburg. Due, 26/11/47.

Bolts and nuts: S.A.R. & H. Tender Board. No. 7033. Due, 6/11/47.

Brass & Copper Sheet: S.A.R. & H. Tender Board. No. 7208. Due, 18/12/47.

Brass and Copper bar: S.A.R. & H. Tender Board. No. 7091. Due, 27/11/47.

Chain: S.A.R. & H. Tender Board. No. 7219. Due, 27/11/47.

Copper plates for locomotive boilers: S.A.R. & H. Tender Board. No. 7299. Due, 11/12/47.

Contour sawing and fitting machine: S.A.R. & H. Tender Board. No. 7173. Due, 20/11/47.

Carbon dioxide fire extinguishing equipment: City Electrical Engineer, Port Elizabeth. Specification 308. Duplicate copies of documents on deposit of 10s. 6d. Due, 27/11/47.

Coir rope: S.A.R. & H. Tender Board. No. 7339. Due, 18/12/46.

Carbonizing retorts and auxiliary plant: Stores Dept., Johannesburg Municipality. Contract No. 260. Due, 13/11/47.

Compression tools and sleeves for wire: Dept. of Posts and Telegraphs, Pretoria. P.O. 868. Due, 27/11/47.

Cotton waste: Dept. of Posts and Telegraphs, Pretoria. P.O. 869. Due, 27/11/47.

Corrugated iron bending machines: Natal Provincial Tender Board, P.O. Box 358, Pietermaritzburg. No. 67/47. Due, 26/11/47.

Drilling machines: S.A.R. & H. Tender Board. No. 7118. Due, 18/12/47.

Fencing wire: S.A.R. & H. Tender Board. No. 7193. Due, 13/11/47.

Grinding wheels: S.A.R. & H. Tender Board. No. 7287. Due, 18/12/47.

Gas pressure cooker: Stores Dept., Johannesburg Municipality. Contract 259. Due, 13/11/47.

Hydraulic leather: S.A.R. & H. Tender Board. No. 7382. Due, 18/12/47.

Hydraulic accumulator: S.A.R. & H. Tender Board. No. 7256. Due, 4/12/47.

Hose pipes: S.A.R. & H. Tender Board. No. 7286. Due, 11/12/47.

Jar roll-over moulding machine: S.A.R. & H. Tender Board. No. 7225. Due, 20/11/47.

Leather reviver ingredient: S.A.R. & H. Tender Board. No. 7446. Due, 6/11/47.

Lathes: S.A.R. & H. Tender Board. No. 7182. Due, 20/11/47.

Locomotive connecting rods: S.A.R. & H. Tender Board. No. 7320. Due, 4/12/47.

Ladders, wood and metal: Dept. of Posts and Telegraphs, Pretoria. P.O. 853. Due, 6/11/47.

Laboratory apparatus to King George V Hospital, Durban: Union Tender and Supplies Board, P.O. Box 371, Pretoria. S.O. 1953. Due, 13/11/47.

Lathe: S.A.R. & H. Tender Board. No. 7328. Due, 11/12/47.

Lathes: S.A.R. & H. Tender Board. No. 7439. Due, 8/1/48.

Lathe: S.A.R. & H. Tender Board. No. 7343. Due, 6/11/47.

Lathe: S.A.R. & H. Tender Board. No. 7348. Due, 18/12/47.

Lathes: S.A.R. & H. Tender Board. No. 7349. Due, 18/12/47.

Lathes: S.A.R. & H. Tender Board. No. 7370. Due, 18/12/47.

Lathes: S.A.R. & H. Tender Board. No. 7383. Due, 11/12/47.

Lathes: S.A.R. & H. Tender Board. No. 7116. Due, 18/12/47.

Motor Vehicle Batteries: S.A.R. & H. Tender Board. No. 7102. Due, 13/11/47.

M.D. double stone floor grinders: S.A.R. & H. Tender Board. No. 7261. Due, 4/12/47.

M.D. crank pin quartering machine: S.A.R. & H. Tender Board. No. 7186. Due, 4/12/47.

Machine tools—including lathes, shaping, planing, milling, grinding, slotting and drilling machines, hand and small tools and equipment for a blacksmith's shop. Southern Rhodesia Government Tender Board, Salisbury. Tender No. 1481. Due, 6/11/47.

Medical and X-ray supplies to Central Medical and Veterinary Stores, Pretoria: Union Tender and Supplies Board, P.O. Box 371, Pretoria. S.O. 1953. Due, 13/11/47.

Nickel pellets to S.A. Mint: Union Tender and Supplies Board, P.O. Box 371, Pretoria. S.O. 1963. Due, 6/11/47.

Paint for electrical standards: S.A.R. & H. Tender Board. No. 7501. Due, 27/11/47.

Patent glazing to steel roofs to new T.V. sheds at John Ware Park, Johannesburg. City Engineer, Johannesburg. Contract 1893. Due, 5/11/47.

Piping and fittings: S.A.R. & H. Tender Board. No. 6829. Due, 13/11/47.

Punching and shearing machines: S.A.R. & H. Tender Board. No. 7172. Due, 27/11/47.

Radial drilling machines: S.A.R. & H. Tender Board. No. 7234. Due, 20/11/47.

Radial drilling machine: S.A.R. & H. Tender Board. No. 7258. Due, 18/12/47.

Radial drilling machine: S.A.R. & H. Tender Board. No. 7168. Due, 4/12/47.

Radial drilling Machine: S.A.R. & H. Tender Board. No. 7255. Due, 4/12/47.

Rotary exhausters: S.A.R. & H. Tender Board. No. 7145. Due, 20/11/47.

Ratchets for use with wire: Dept. of Posts and Telegraphs, Pretoria. P.O. 866. Due, 27/11/47.

Shaping Machines: S.A.R. & H. Tender Board. No. 7169. Due, 27/11/47.

Slotting machine: S.A.R. & H. Tender Board. No. 7238. Due, 20/11/47.

Steam heating gear — rubber parts: S.A.R. & H. Tender Board. No. 7248. Due, 27/11/47.

Steam heating gear — metal parts: S.A.R. & H. Tender Board. No. 7431. Due, 8/1/48.

Synthetic resin bonded fabric sheet and paper sheet and laminated plastic rod: Dept. of Posts and Telegraphs: P.O. 867. Due, 20/11/47.

Shaping machines: S.A.R. & H. Tender Board. No. 7257. Due, 4/12/47.

Solder, resin-cored: Dept. of Posts and Telegraphs, Pretoria. P.O. 854. Due, 6/11/47.

Steel tubes and pole stays: Dept. of Posts and Telegraphs, Pretoria. P.O. 856. Due 13/11/47.

Time meters: Dept. of Posts and Telegraphs, Pretoria. P.O. 855. Due, 6/11/47.

Traversers, electrically operated: S.A.R. & H. Tender Board. No. 6468. Due, 27/11/47.

Vacuum brake gear metal parts: S.A.R. & H. Tender Board. No. 7151. Due, 6/11/47.

Wood working machines to Drostdy Technical High School: Union Tender and Supplies Board, P.O. Box 371, Pretoria. S.O. 1960. Due, 6/11/47.

Woodworking machines for Fort Napier Hospital, Pietermaritzburg: Union Tender and Supplies Board. P.O. Box 371, Pretoria. S.O. 1967. Due, 6/11/47.

X-ray film developer, etc., to Division of Tuberculosis Services, Durban: Union Tender and Supplies Board, P.O. Box 371, Pretoria. S.O. 1964. Due, 13/11/47.

NEW MINES NEW METHODS LARGER TRUCKS

With the development of new mines, new methods are being introduced that will greatly increase output. Notably among these is the supplementing of the old type of truck of small capacity, by the "Granby" type mine truck, the use of this type of truck — manufactured and supplied by Robert Hudson — in no small way contributed to the recent record development of the Grootvlei Mine.

Designed and manufactured by Robert Hudson & Sons, Ltd., the "Granby" type truck is a 100% South African product of especially robust construction, which will withstand years of high pressure work under South Africa's mining conditions. Let us give you complete specifications of the "Granby" type and quote you for your requirements.

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