SOUTH AFRICAN ARCHITECTURAL RECORD

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SOUTH AFRICAN ARCHITECTURAL RECORD

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A LAWRENCE H. TEARLE PUBLICATION

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EDITORIAL

THIS year has seen the Jubilee of the Institute of South African Architects, incorporating the Chapter of South African Quantity Surveyors. Twenty-five years ago the Private Act was passed which saw the founding of the Institute and Chapter as we know them—in the latter case a unique event in the status of the quantity surveyor both in the Union and elsewhere. It is to be regretted that one of the fathers of the Institute, the late Robert Howden, was not to participate in the celebrations he did so much to bring about. It is fitting here also to pay tribute to the unbroken services of Jack Lewis, Registrar of the Institute, since its inception.

About the celebration. It may be fairly asked why such an important event in the life of our Institute, a body of professional men in both spheres, which has played a great if practically anonymous part in the physical development of our land, and still fills an important and vital role, marked as it was by a banquet, passed almost entirely unnoticed and virtually without mention or publicity in the Press and elsewhere. It is our intention to publish an historical survey in a forthcoming issue. But this is not sufficient. It is of course accepted and fitting that members in their normal professional activities should respect the dictates of professional etiquette and avoid personal publicity. But the professions as entities represented by their statutory organisations, need not and should not hide under a cloak of professional reticence. There is still all too great a misconception of the role of the professions in our national life, both on the part of individuals and authoritative bodies. We need the right sort of publicity and we need a public relations officer at Central Council level to fulfil this important function.

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Elsewhere in this issue we introduce a new feature to the Journal, The Architectural Science Committee publication. This is at least visual evidence of the great deal of preparatory work carried on both by members of this new committee and of the great deal of tireless work done by many members of the T.P.I.A., and others, who by reason of their availability, have served on committees of the South African Bureau of Standards. Their contribution made on behalf of the Institute merits the sincere thanks of all.

The A.S.C. publication will appear periodically in standard form with file references given, so that members will be able to retain these technical references in file if they so desire. Another event which enjoyed good support of members was the first Summer School, proceedings of which will be published shortly.

The last meeting of Central Council saw the appointment of Mr. D. F. H. Naude, of the C.P.I.A., and Mr. T. H. Louw of the Chapter, as President- and Vice President-in-Chief. This is in a sense a recognition of their valuable work both on Central Council and more particularly on the Councils of their respective bodies. To them we offer our sincere congratulations and good wishes for successful and fruitful terms of office.

* * * * *

With this issue the Journal enters a new phase of its development, not the least is its adoption of a square back. The T.P.I.A., publishers of the Journal since its inception, on behalf of the Institute as a whole, whose official Journal it has always been in name if not in fact, have now concluded an agreement with the publishing house of Lawrence H. Tearle of Cape Town for its publication.

While the Institute retains control of its editorial organisation and policy, the management and publication of the Journal now falls under one organisation. Not only will this arrangement result in improved co-ordination, but also in a better means of recording the work in all provinces and not predominantly that of the Transvaal, and to a certain extent that of Natal by reason of their effective liaison committee, which force of circumstances had previously brought about.

We look to members to give their support to this new development so that our Journal may in fact live up to its name.

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As this is the last issue of the year the Editors and Publishers wish all members the Compliments of the Season and Good Health and Prosperity in the New Year.

HATHERLEY HALL, KILLARNEY, JOHANNESBURG

A NEW BLOCK IN JOHANNESBURG'S LUXURY FLAT AREA BY S. A. ABRAMOWITCH, A.R.I.B.A., M.I.A.

THE PROGRAMME

The building required was a luxury block of flats to be built in two portions, 30 flats now and approximately 20 flats at a later stage.

Garaging was to be provided for cars and as much of the site as possible was to be used for garden development. The usual servant accommodation was to be provided.

THE SITE

The site, about an acre in extent, is situated in Killarney. It is bounded by streets on the north, east and west. A gentle slope down from south to north made it imperative to adjust the entrance on the north of the building, adjacent to the future wing, to suit the lower level of the impending addition. Coverage allowed by zoning regulations was 50 per cent. for a building five floors in height.

THE BUILDING

In placing the building on its site various block arrangements were tried to obtain firstly, as many north-facing flats as possible; secondly, as much privacy to each flat as possible and thirdly a maximum amount of open space for garden development. The solution finally adopted was a U-shaped building with the two long arms of the U facing north and the connecting wing facing north-east. This arrangement allowed for the inclusion of a large garden as a buffer between wings.

There was, however, one slight disadvantage to this solution (much outweighed by the numerous advantages) and that is that the east-facing wing looks into the north one, though every effort was made to minimise this in the detailed planning. The three wings were then so articulated as to be held together by "loose", semi-transparent links. These links house the main stairs and lifts.

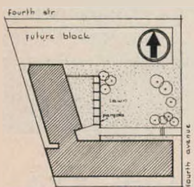
In planning the individual flats an effort was made to separate as far as is practicable the sleeping and living zones of each unit and to relate as closely as possible the kitchen and toilet areas to spaces they are meant to serve.

The living zone was planned in a free manner subdividing the entrance, dining and lounge spaces by screens or walls, thus creating a very real and continuous sense of space. The entrances of nearly all the flats are separated and defined by a seven-foot-high free standing wall containing a large cloak and hat cupboard. The screens between lounges and dining rooms are of simple trellis design and can be used for the display of plants and knick-knacks.

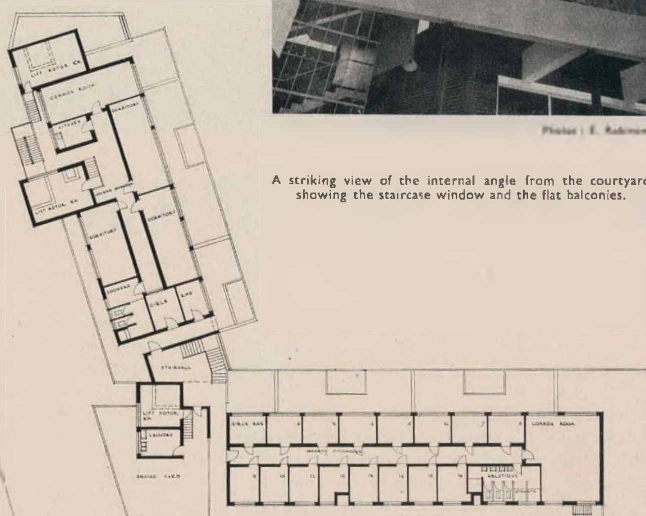
The zoning of the functions in each living unit has resulted also in a minimum of cross circulations, a very real problem in flat planning. Each kitchen of the larger flats has a service entrance while each individual kitchen is fitted out with continuous working tops, storage space and cupboards giving an even line round the room.

All the bedrooms have built-in wardrobes while in the two and three bedroom flats, wash hand basins have been built into the wardrobes of the secondary bedrooms. The lounges are heated by "Thermovent" heaters included in a long cantilevered wall fitting containing bookshelves, display and mirrored cocktail cabinets.

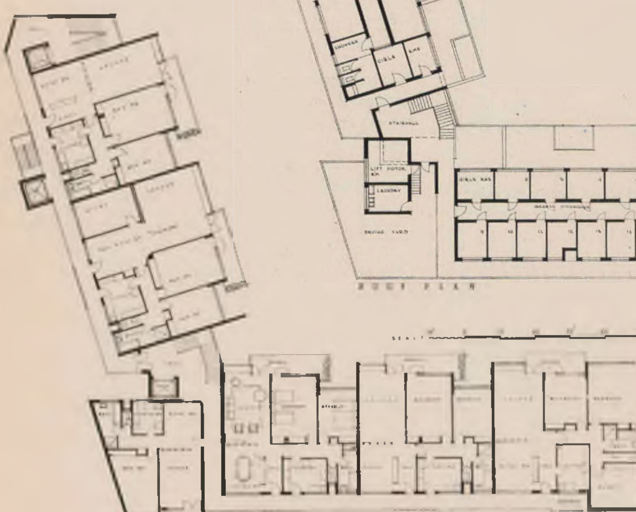
A striking view of the internal angle from the courtyard showing the staircase window and the flat balconies.



SITE PLAN



ROOF PLAN



TYPICAL FLOOR PLAN

The colour schemes in the flats have been kept simple not to clash with tenants tastes and furnishings. The walls are mostly a light pinky buff with white ceilings. Doors have been painted a light blue-grey for serviceability with the steel frames painted terra-cotta. This should minimise the usual finger stains associated with doors. The kitchens are enamelled white with sky-blue fittings and a cherry red mottled linoleum floor.

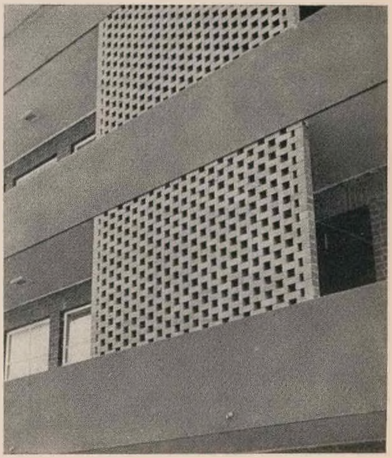
The problem of sun and heat penetration was very carefully considered as the careless use of glass has become a notable cliche in local architecture. It was desired to open up the flats to the outside as much as possible but at the same time it was necessary to cut out as much undesirable sun penetration as possible.

The large projecting balconies act as a very effective sun break and the recessing of exposed rooms between two very large projecting walls on either side further eliminate sun but allow in a great deal of light through the wall to wall windows. This continuous breaking back of the facade was neutralised aesthetically by the introduction of a visually insistent surrounding frame which, in addition gives unity to the various wings.

The inclusion of an internal flower box on the side of each balcony resulted in the splaying out of the walls concerned so as to minimise interference with the usable space on these balconies. Access to the balconies from the lounge is through large double doors.

On the access gallery side of each wing honeycomb walls were introduced to screen the doors to each flat from rain and the building which will eventually be built on the site behind. The pergola across the east facade

(Above)—The large projecting balconies act as a very effective sun break, and the recessing of exposed rooms between two large projecting walls on either side further eliminates sun. *(Below)*—On the access gallery side of each wing, honeycomb walls screen the doors to each flat from rain.



(*Above*)—Two views of a lounge at Hatherley Hall. (*Below*)—Screens between lounges and dining-rooms are of simple trellis design. (*At foot*)—Hatherley Hall from the architect's perspective. Interior photographs are by B.R.S. Photographers.

was introduced primarily as an aesthetic device to unify the three wings and hold them together like a taut cable. The beam also serves as a space modifier and introductory motif to the entrances of the building.

Originally the walls of the garage were to be built of stone to contrast with the smoothness of glass and plaster, but for some obscure reason the township owners would not allow this. The predominating colour of the facades is an ivory white with pale green balconies on the front and mustard yellow on the access galleries at the back. All facebricks are plum colour.

CONSTRUCTION AND SOUND INSULATION

The building is constructed of a re-inforced concrete frame with floors cast on wood-wool hollow tile permanent shuttering for sound insulation between floors.

The problem of sound insulation was very seriously considered and the 12-in. by 2-ft. by 8-ft. "Cellocrete" tile was used as the best insulator at the price. The use of this hollow tile also cut shuttering costs by approximately 60 per cent. For further sound insulation fibre board ceilings were used, nailed to brandering fixed directly to the soft underside of the tile.

Noise between flats was minimised by the use of eight-inch cavity party walls. Heat insulation between roof and the top floor of flats was also achieved largely by the use of nine-inch-thick screed and the wood-wool tiles.

To avoid wire draperies in the form of radio aerials as is usual in flat blocks, each flat has been provided with aerial access to the roof through special pipe ducts cast in the cavity walls.

THE ARCHITECT AND FOUNDATION ENGINEERING

A lecture delivered to the Cape, Transvaal and Natal Provincial Institutes of Architects during the early part of this year

By B. A. Kantey, M.Sc., Senior Research Officer, National Building Research Institute

WITH the trend towards bigger and better structures, the building world is fast realising that the successful application of modern architectural trends is becoming more and more a question of team work. In the old days, the architect was limited in his design to his knowledge of what his materials could do. To-day, with the developments of pre-stressed and re-inforced concrete, structural steel work and modern light-weight construction, there appears to be no limit to the architect's ingenuity and one cannot but be perpetually amazed and delighted at the examples of functional beauty that are being erected throughout the world to-day. But, just as knowledge of these aids to modern architecture is growing apace, so is the engineering design becoming more and more a specialist occupation. Despite the fact that architects to-day are given a reasonable grounding in the principles of re-inforced concrete design, it is a bold architect who would set out to design the structural elements of a modern multi-storeyed structure, and it appears to be standard practice to call in a re-inforcing specialist to tackle this aspect of the problem. Similarly with such details as air-conditioning and ventilation and the host of allied subjects that are incorporated in modern structures. So the need for team work grows and, although each modern structure is a monument to the responsible architect, it is reasonably safe to assume that without the assistance of these various specialists, the structure, while still being aesthetically beautiful, would not perform its functional duty with so great an efficiency.

* * *

But what of poor old mother earth who, in the final analysis has to carry this modern structure? How much consideration is she getting in this building up of a successful team?

In the old days, the architect could, within limits, pick and choose his site and, if he were fortunate enough, he founded his structure on rock which would present no problem at all. To-day, however, such desirable sites are frequently not available and the architect has willy-nilly to design his structure for any given site. In Cape Town for example he has to put up structures in reclaimed areas or the Cape Flats area where foundation conditions are not so simple. Yet it still appears to be fairly standard practice to design one's foundations on the basis of previous experience, rule of thumb methods or, in the extreme cases, a quick kick at the earth and the remark "that will take one or two tons per square foot" as the case may be. With the result that this elaborate structure, the result of the combined efforts of the best available brains, has so often figuratively, and in many cases literally too, feet of clay.

Fortunately cases of complete foundation failures in South Africa are rare, but there is no knowing how long this situation will continue, or at what cost this happy condition has been brought about. As professional men, it is the team's duty to provide the client with the best structure at the least cost and they would be failing in this duty if the client were faced with an unnecessarily costly foundation. To obviate this, a specialist field has developed in recent years, which has concentrated on the science of foundation engineering, and which has come to be known as Soil Mechanics. It is the purpose of this paper to bring to your attention this branch of engineering so that it too may take its rightful place in the team.

* * *

Although it was not until 1925 when Dr. Karl Terzaghi published his important series of articles in the *Engineering News Record*, that the study of soil as an engineering material received the impetus to develop to what it is to-day, both the art and science of control and utilization of soil as a building material have their beginnings in prehistoric times. The pile foundations for the support of shelters for lake dwellers and the earth mounds of Neolithic man are some of the earliest examples, while tunneling was practised by the Persians at least as far back as 800 B.C. Archeological explorations seem to indicate that the failure of the walls of Jericho in 1,400 B.C. was due to the "foundation tier of stones being displaced laterally to the outside and tipped forward as if a trench had been dug along the bottom of the wall to undermine the base. A possible solution to an age-old question, and an application of soil mechanics knowledge."[1]

However, existing contributions to the studies of soil as an independent problem date back to the seventeenth century when French military engineers produced a succession of empirical and analytical analyses of earth pressures and soil slopes as necessary data for the design of fortifications. Italian, Dutch and Swedish scientific publications began to figure contributions on lateral earth pressures, at first as applied to fortifications, and later as scientific problems attacked experimentally as well as analytically, and Coulomb's work in 1773 changed the entire approach to earth pressure problems leading to many experimental attempts to prove or disprove his theories.

So through the eighteenth century and, during the nineteenth century, studies on other soil problems began to supplement the attack on the lateral earth pressure problem. Subjects such as shore erosion, pressures on the inside and outside of bins and cells, flow of soil from orifices, pile foundations and soil control by wood pile and by the introduction of "sand piles" began to receive attention but no effort was made to co-ordinate these studies into a separate branch of engineering. Comparatively early in this century, however, Dr. Karl Terzaghi began to take an interest in soils engineering and, shortly began to take a considerable interest in soils engineering and, shortly after the appearance of his classical work on soils[2] the abovementioned series of articles on soil mechanics and foundation engineering appeared in the *Engineering News Record* of 1925. This series of articles summarised and co-ordinated all the work on soils that had been achieved to date and it can be safely said that this series of articles has formed the basis for the vast increase in technical knowledge of soil as an engineering material. With this modern knowledge of the behaviour of soil as an engineering material it is reasonably safe to say that, to-day, no site should be condemned as unable to support a given structure.

From the engineer's point of view, Soil Mechanics is divided into two main branches. The first deals with remoulded soils where soil is excavated from a selected borrow pit and used as a construction material in the structure. Roads and highways, airport runways and earth dams are the major structures in this branch of soil mechanics and advances in this field have kept pace with the increasing demands of wheel loading in the case of airports and height of structure in the case of dams.

The second main branch deals with *in-situ* soils where the best use has to be made of the naturally existing soil to safely support the structure intended to be placed on it. It is this latter aspect that is of direct concern to the architect and consequently only this aspect will be dealt with in this article.

* * *

It is comparatively rare to find a case of complete foundation collapse such as illustrated in plate 1. There are, however, some classic cases of inadequate foundation design in recent years such as the Railroad Terminal at le Havre, the Palais de Justice in Cairo, the Charity Hospital in New Orleans, the office building of the Compania Paulista di Seguro, Sao Paulo and quite recently, the Normal School of Mexico City. Coming nearer home

Plate 1. A case of complete foundation collapse, illustrating a grain silo practically on its side (see fig. 4).

of course, there is the infamous grain elevator at Durban. However, to the owner of the building a partial failure which results in unsightly cracking in the walls will be regarded with practically as much disfavour—particularly as these cracks mostly develop some time after the structure is completed. Typical examples of this type of failure may be seen in the Cape Town and Durban areas and, of course, abound in the O.F.S. goldfields area (see plates 2-5).

From a Soil Mechanics point of view, this type of failure is generally connected with movements of the foundations and may be due to one of three major causes. These are:

1. Settlements due to compressible materials in the sub-soil.
2. Settlements due to shear distortions in the sub-soil.
3. Foundation movements associated with changes in moisture content in partially-saturated sub-soils.

Fig. 1. Explanation of dish-shaped settlement due to compression of underlying soil.

Plate 2.

Plate 3.

Plate 4.

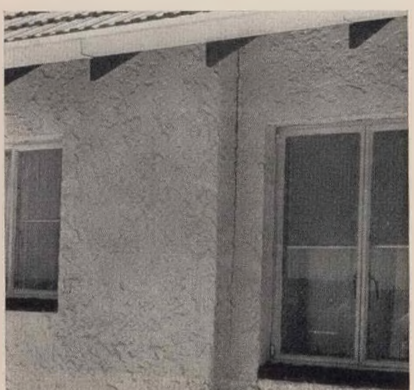


Plate 5.

Plates 2 to 5. Examples of structural cracking in the O.F.S. due to expansive soils.

The settlement of a structure is usually brought about by the compression of the underlying soil due to the weight of that structure. If this settlement were uniform over the building site, the structure would go down evenly and no harm would result. However, this seldom occurs in practice, and theory as well as practical experience has shown that a dish-shaped settlement is liable to occur (see plate 6). This can be quite simply explained by reference to figure 1. It can therefore be seen that the cardinal criterion for settlement is not the individual footing but the structure as a whole and normally a depth of soil, at least one-and-a-half times the minimum plan dimension of the structure, is affected.

Were this settlement to take place rapidly during the construction period of the structure, it is quite possible that these settlements could be allowed for but, in most cases where the expected settlements will be such as to damage the structure, conditions of high water table and saturation exist.

Compression of the sub-soil must therefore be accompanied by a squeezing out of the water in the pores of the soil—a process known as consolidation—and, as the rate at which this pore water is squeezed out is a function of the perviousness of the soil, with most highly compressible soils, consolidation takes place over a considerable period of time and cases are on record where settlements have continued for periods of over 60 years. Such conditions cannot be allowed for in the structural design and the only answer to a problem of this nature is to design the foundations of the structure in such a way as to give a minimum permissible differential settlement.

This, however, is not the only difficulty to be encountered with compressible soils. Quite often a structure has to be designed on a site adjacent to existing buildings. These existing buildings may have stood safely for many years but, when the new structure is erected and consolidation commences to take place, the soil under the existing structures may also be affected with the disastrous results shown in plate 7[3]. Such damage may result in costly law suits being instigated and there are many examples of this type of damage having occurred in the U.S.A.

* * *

No discussion of settlements of structures would be complete without reference to the question of quicksands. Contrary to popular belief, quicksand is not a type of sand but a condition which, in special conditions, can occur in any granular material. It is characterised in the extreme case, by the inability of the material to support a load, while in the partial condition, where the material is liable to become quick, a great reduction in the expected load-carrying capacity of the material results. A common practical observation of quicksand conditions may be found on many beaches where, at low tide, the damp sand is firm enough to support motor vehicles but once the tide starts coming in, the upward flow of water through these sands causes them to lose stability and hence bearing capacity, until the extreme case arises where all stability is lost and the sand can support no load. Quicksand conditions are also frequently encountered at the bottom of excavations below the water table where these conditions are produced by seepage pressure. The so-called "running sands" of the Table Bay area are typical of these conditions.

It is therefore evident that quicksand conditions are intimately associated with the flow of water through the material. This flow tends to float the grains in the water, gradually reducing the intergranular pressure as the rate of flow is increased until, in the extreme case, the mass of material liquifies and all the particles are in suspension.

In building practice, such extreme cases are very rare. The more common cases occur where a flow of water, either existing or present in some previous history of the deposit, is holding or has left a layer of material in a very loose state. The soil profile, as a whole, is usually able to support a fair load without failure, but if the load is increased to the point where the shearing force transferred to this loose layer becomes greater than the available shear strength of that layer, a sudden and spectacular collapse of the whole profile occurs, usually with disastrous results. This increase in shearing force may also be brought about by sudden shock such as occurs with pile driving and is a frequent cause of damage to buildings on sites adjacent to new constructions founded on piles.

Settlements due to shear distortion of the sub-soil are, however, far more complex problems. These movements generally arise as a result of the shear stress condition in a sub-soil brought about by the superimposed load of the structure. They may be due to pure elastic distortion of the soil under load or may be due to plastic flow and partial failure when the soil is stressed beyond the elastic limit. These stress conditions can be calculated from the general elastic equations developed from the Boussinesq theory of distribution of stress due to load on the surface of an infinite homogeneous and isotropic elastic medium and, although it is generally agreed that the average soil does not satisfy these conditions, practical field observations have shown sufficient correlation between these theories and practice to warrant their adoption.

Figure 2 shows the results of a typical calculation of the stress distribution for the case of an infinitely long, flexible strip footing where contours of equal shear stress and equal vertical components of shear are depicted. The settlement at any point on the surface may be computed by integrating the vertical strains in any elementary section on a vertical line through the point. Usually these settlements take place very rapidly, and, providing the

Plate 6. An example of dish-shaped settlement of a large building.

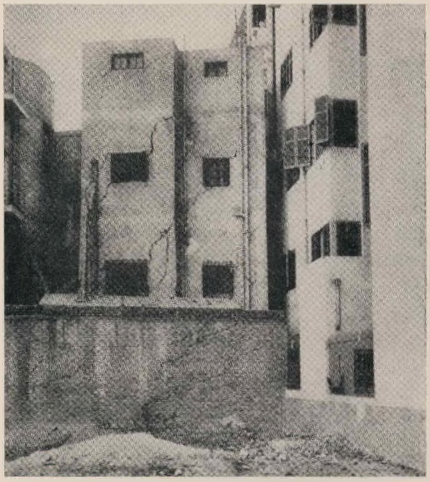


Plate 7. Structural cracking of an existing building resulting from soil compression due to the load of a new building seen at right.

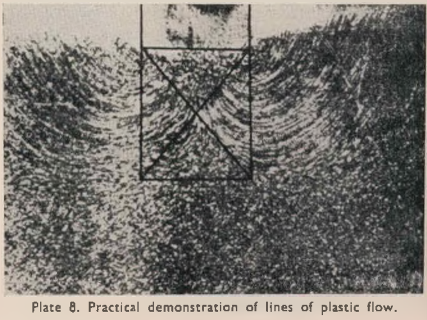


Plate 8. Practical demonstration of lines of plastic flow.

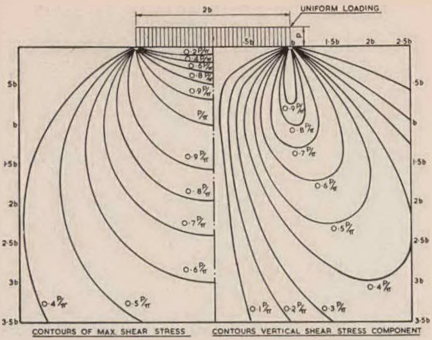


Fig. 2. Calculation of stress distribution for a flexible strip footing.

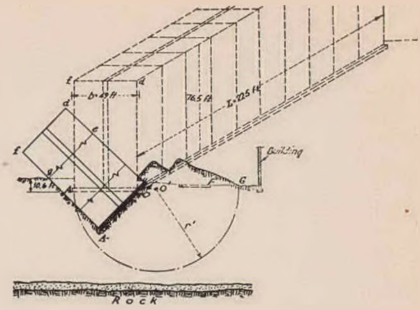


Fig. 4. Foundation failure due to plastic flow of sub-soil in one direction.

loadings are well within the limits of failure, the volume change and hence total movements are small. The differential movements are consequently practically negligible and except in some isolated areas very few buildings have ever failed as a result of such shear distortion of the sub-soil.

* * *

The more common cause of failure results from over-stressing of the sub-soil resulting in plastic flow of the soil under and around the footing. The theoretical lines of flow are shown in figure 3 and the practical proof of these lines of flow has been shown by Enger[4] (see plate 8). These experiments dealt with a selected perfectly homogeneous material which gave the symmetrical flow pattern depicted but, in practice, there is usually sufficient variation in the sub-soil to cause plastic flow to develop in one preferential direction resulting in the extreme case in a failure such as was shown in plate 1 and diagrammatically in figure 4. Quite often, however, this type of failure may occur under one or two footings only, resulting in partial failure of portion of a structure with the accompanying unsightly cracking of the walls. This type of failure may have resulted from unequal footing loadings or, more probably, from strength variations of the sub-soil under the site.

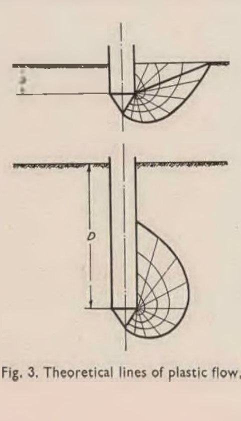


Fig. 3. Theoretical lines of plastic flow.

* * *

The third type of foundation movement which is associated with changes in moisture content of partially saturated sub-soils is generally found over large portions of South Africa characterised by comparatively deep-seated water tables in desiccated expansive clay formations. This subject has been admirably dealt with in a recent paper by J. E. Jennings[5] and it is sufficient here to briefly indicate that the root cause of this movement seems to be the interference by the structure with the natural movement of soil moisture resulting in an accumulation of moisture in the sub-soil under the structure. Since these clay materials expand on addition of moisture, swelling of the soil under the structure takes place, the building rises and, since the rise is unequal with a tendency towards the greatest rise in the centre, the back of the building is broken and the unsightly cracks shown previously develop.

* * *

While many of these facts were known to engineers and architects for many years, it was left to practitioners of the science of Soil Mechanics to delve into the why's and wherefore's of the behaviour of a soil mass under load. During the past 40 years a vast amount of research work has been carried out and Terzaghi's work on consolidation and Prandtl's on the plastic equilibrium of a soil mass under load have formed the basis for the ever-increasing knowledge of the reaction of the soil to load. Hand in hand with this theoretical and laboratory research, practical full-scale tests have been carried out and a sampling and testing technique evolved to enable one to predict the behaviour of the soil under a site to the load of the proposed structure. That this knowledge is not yet complete is due largely to the vagaries of Mother Nature and the complexity of the soils even under one site but, at very least, one can now go beyond the empirical stage and apply much of the proven knowledge within recognisable limitations to the evaluation of a safe foundation design.

* * *

How, then, can this safe foundation design be achieved? Here the magnitude of the job plays a cardinal part and, under most circumstances, the total cost of the structure must dictate the amount that can be set aside for the foundation investigation and design. A good rule to observe here is that the cost of this work should not exceed one per cent. of the total cost of the structure. Of course, where conditions are critical this figure may have to be exceeded but in general the above rule should apply. The minimum work that should therefore be done is a preliminary exploration programme which involves putting down boreholes to identify the various strata in the sub-soil and, since the stress conditions in the sub-soil are affected by the weight of the structure to a depth of at least one-and-a-half times the minimum plan dimension of that structure, these borings should be taken down to that depth or to rock. Because of the decisive influence of geology on the variations in the soil profile, this exploratory programme should be preceded by a geological investigation of the general character of the site so that from this information, a clear knowledge can be obtained of the method of formation, thickness, shape and continuity of the strata encountered below the foundation. With this preliminary essential knowledge to hand, the investigation programme can now be planned.

This programme may consist of additional borings to fully disclose the variations in soil profile across the site and disclose the boundaries of weak spots; the performance of simple field tests to indicate the strengths of the various layers in the sub-soil or the obtaining of disturbed and undisturbed samples for a full-scale laboratory testing programme from which the strength and compressibility characteristics of the soil profile may be obtained. The decision on this programme is, however, not only dictated by the economics of the job but also by the soil conditions existing under the site.

If, for example, a structure is to be built above a fairly homogeneous layer of clay, a considerable amount of laboratory soil testing may be justified since the results of these tests can be used to get a fairly reliable forecast of both the time and amount of settlement to be expected. Harmful differential settlements may be eliminated at reasonable expense by redistribution of load or the addition or re-distribution of basements and sub-basements. If however, the same structure is to be founded above an erratic deposit of pockets and lenses of sands and clays, the same amount of laboratory testing would add little of value to the information that could be obtained from simple indicative tests on representative samples from the exploratory boreholes and it would be of far more use, and certainly less expense, to plan an additional series of simple sub-surface soundings which could disclose the boundaries of the weak spots located between the initial borings.

* * *

In order therefore to adapt the investigation to the economics of the job and obtain the maximum information with the minimum expenditure of time and money consistent with that economy, the engineer in charge should be familiar with the tools and processes available for obtaining this information, with the methods available for analysing the results of field and laboratory testing and, most important of all, with the uncertainties and limitations involved in the various methods of soils exploration. The soils exploratory programme should present no difficulties. During the last couple of decades considerable advances have been made in this aspect of soil mechanics and a recent publication by Juul Hvorslev[6] of the U.S. Waterways Experimental Station at Vicksburg goes into the whole field of sub-surface exploration in great detail, indicating a wide range of sampling tools for use in different types of soils and for different purposes of sampling. This information is readily applicable to South African conditions and depths of over 100 feet have been sampled in the Durban area.

Once the variations in the soil profile have been established, the next step is to determine how this profile will behave under the load of the structure. For the smaller structures founded on comparatively uniform sub-soils or for the erratic soil profiles, it may be sufficient to merely classify the soils by means of consistency and classification tests and make use of one or other of the excellent tables of allowable soil pressures, such as that given in Terzaghi and Peck[7], to obtain a reasonably accurate estimate of the bearing capacity of the soil profile. This type of information is comparatively inexpensive to obtain but is naturally not too accurate though erring on the safe side. It may however be added to by the performance of one or other of the simple field tests which have recently been developed.

Where clayey soils exist in the soil profile, the simplest and least expensive of the field tests is the unconfined compression test which is performed on undisturbed samples extracted during the drilling operations. The test essentially measures the shear strength of the soil on

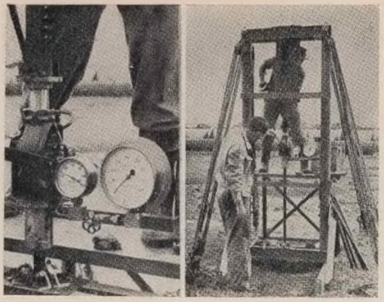


Plate 9. Deep sounding apparatus which measures the variation in bearing capacity with depth in saturated soil conditions.

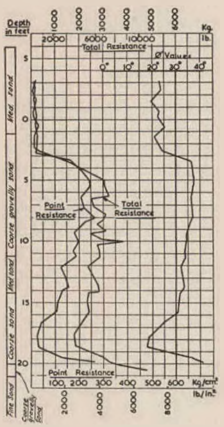
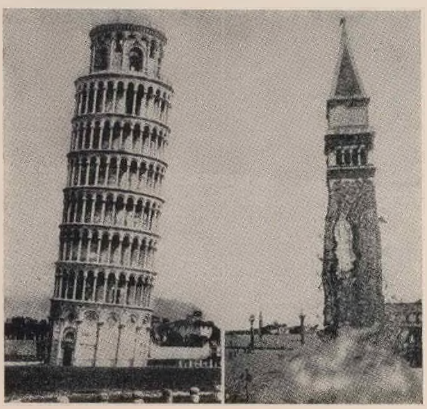


Fig. 5. A typical sounding result.

Plate 10. (*Left*)—The Campanile or Leaning Tower of Piza. (*Right*)—The Campanile, Piazza of St. Mark's, Venice, which collapsed in 1902.



the basis of cohesion only and is widely used in areas overseas such as London where clay conditions predominate. Since no allowance is made for internal friction, the results are a bit on the conservative side but not unduly so as clays usually have low angles of internal friction.

Where however an erratic soil structure exists, consisting in the main of layers of sand and clay with sand predominating, some form of deep-sounding apparatus such as that shown in plate 9[7] can be used with reasonable confidence. The apparatus is essentially a form of small scale bearing test giving the variation in bearing capacity with depth and has been used quite widely in South Africa recently. It is, however, only of use where saturated conditions are found, such as in coastal and other areas with high water table. A typical sounding result is shown in figure 5.

* * *

Under most circumstances in South Africa, sufficient information can be gathered from the abovementioned forms of testing to provide an adequate design. Where, however, compressible clays exist in quantity and the differential settlements and allowable bearing capacity become critical factors in the design, more detailed laboratory testing of undisturbed samples must be resorted to. From the results of shear tests, the allowable shear strength of the sub-soil is obtained using a factor of safety and the loading of the structure so adjusted that the induced shear strength does not exceed this value.

From the results of compressibility test, time settlement and load settlement relationships are found which are then used in conjunction with the stress distribution under the load of the structure and the thickness of the compressible layer to calculate the amount of settlement and the time during which this settlement will occur. The loading of the structure may then be adjusted to obviate differential settlements or, by the use of basements and sub-basements which reduce the loading on the sub-soil by the weight of soil excavated, the settlements may be considerably reduced.

It can therefore be seen that tools and techniques are to-day available to ensure a safe foundation design for practically any structure on practically any site. In the interest of brevity the various factors involved have only been briefly indicated though each in itself could form a lengthy article of its own. It is hoped, however, that sufficient has been said to show that the science of Soil Mechanics can satisfy a vital need for the safe and economical design at building and other foundations. Although, cases of inadequate foundation design are rare in South Africa, there is no knowing at what cost this has been brought about. Foundation failures have however occurred and an examination of some of the more

Plate 11. The National Theatre, Mexico City, completed in 1909. Severe settlements have necessitated the excavation of ramps down from normal street level to give access to the building.

classic examples may serve to emphasise some of the salient features of this article.

Probably the most famous of all examples is the Leaning Tower of Pisa (see plate 10). The soil profile here consists of alternating layers of sand and clay and the structure was designed to be founded on one of the sand layers with an average unit contact pressure of five tons per square foot. During high winds, however, this pressure was increased at the edge to ten tons per square foot, which caused progressive partial failure to occur resulting in the tilting over of the structure. Fortunately this tilt occurred early in the history of the structure and a carefully conducted strengthening of the masonry was undertaken enabling the structure to withstand the stresses imposed by its eccentricity.

A completely different condition developed at Venice, however, where the ancient Campanile collapsed as shown in plate 10 in 1902. Here the structure was founded on closely spaced timber piles underlaid by alternate layers of sand and clay. Here, too, high-edge stresses due to wind loading caused differential settlement to occur. This, however, resulted in the tower being only 0.8 per cent. out of plumb and the structure was able to withstand these stresses until structural modifications weakened the superstructure and caused its sudden collapse.

The National Theatre at Mexico City is a classic example of inadequate foundation design resulting in very severe settlements (see plate 11). A massive eight-foot thick reinforced concrete foundation mat which weighed almost as much as the entire superstructure was the main cause of the settlement of over six feet since the structure was completed in 1909. As the original ground floor has become practically a sub-basement, it became necessary to excavate ramps to permit access to the structure and the removal of the weight of earth necessary to construct these ramps has considerably lessened the overall load on the compressible sub-soil resulting in a slowing down of the settlements. Here some form of cellular raft of a greater depth could have achieved the same structural strength with much less weight.

Finally there is the Durban grain elevator. The true cause of this disaster is only now being fully investigated from a Soil Mechanics point of view but preliminary thoughts are that the basic cause of this failure was a combination of inadequate design and job planning which could only have been obviated by adequate foundation investigation along the lines indicated in this article.

* * *

The author wishes to thank the President of the C.S.I.R. for permission to present this paper.

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INSTITUTE OF SOUTH AFRICAN ARCHITECTS

ARCHITECTURAL SCIENCE COMMITTEE PUBLICATION

INAUGURATION OF THE SCIENCE COMMITTEE

BACKGROUND

IN September, 1950, a special "Bureau of Standards" committee of Central Council was appointed to maintain liaison with the S.A. Bureau of Standards. It was also instructed to ascertain from the R.I.B.A., the functions, scope and activities of the Architectural Science Board of Great Britain, and to report their recommendations concerning the establishment or otherwise of a similar organization by the Institute in South Africa.

The committee found that there was a great need for the establishment of a Science Committee, appointed by Central Council (rather than a Board which might tend to become rather remote from the Council) to advise on scientific matters pertaining to Architecture. It was recommended that such Science Committee should focus its attention upon, but not be confined to, the natural sciences, having as a main function the application of the natural sciences to architectural problems; that this committe maintain close liaison with the leading research bodies in the Union and elsewhere; that it disseminate information among members of the Institute and Chapter; that it seek either on its own initiative or on reference by outside bodies, research, investigation and report on architectural, scientific and technical matters; that it be responsible for nomination and general supervision of Institute representation on research committees of outside bodies; and finally, that it sponsor science lectures of particular interest to the Professions.

Following a consideration by Central Council of the membership of the proposed committee the recommendations were adopted, and the first meeting of the Architectural Science Committee took place in February, 1952. The Committee is representative of the Architectural and Quantity Surveying Professions throughout the Union and of the four recognized Schools of Architecture.

The membership of the Science Committee at present is as follows: Mr. J. N. Cowin (Chairman), Mr. W. E. Edleston (Vice-Chairman), Mr. H. G. Summerley (Hon. Technical Secretary), Mr. Erik Todd and Mr. N. L. Hanson (Central Council), Mr. T. H. Louw and Mr. G. P. Quail (Chapter), Mr. O. Pryce Lewis, (C.P.I.), Mr. G. C. Cassels, alternate Mr. M. Pincus (O.F.S.P.I.), Mr. L. A. Peyton, alternate Mr. D. E. Franklin (N.P.I.), Professor J. Fassler, alternate Mr. J. Morgenstern (University of the Witwatersrand), Mr. W. G. McIntosh (University of Pretoria), Mr. N. Dowrie, alternate Mr. J. E. Butt (University of Cape Town), Professor P. H. Connell, alternate Mr. L. T. Croft (University of Natal), Mr. D. M. Calderwood (N.B.R.I.), and Mr. W. D. Howie, alternate Mr. U. Tomaselli (S.A. Architectural Record).

ACTIVITIES

The Science Committee has already established a close liaison with the S.A. Bureau of Standards and the National Building Research Institute, and has notified its creation to the Royal Institute of British Architects, the National Federation of Building Trade Employers in South Africa, the Associated Scientific and Technical Societies of South Africa, the Institution of Civil Engineers, the Institute of Chemical Engineers, the Institute of Mechanical and Electrical Engineers, the Institute of Municipal and County Engineers, the Institution of Structural Engineers, the Association of City and Town Engineers and the South African Timber Millers' and Shook Manufacturers' Association.

Summer School

Arising out of a proposal by Professor Fassler, the Science Committee in conjunction with the Faculty of Architecture of the Witwatersrand University organised as one of its first sponsorships, a Summer School which took place during September, 1952. Lectures and demonstrations on current problems were attended by some 70 members, a report on which it is hoped to publish shortly. Furthermore it is hoped that the Summer School idea will grow and that the several Schools of Architecture will in turn contribute to its continuation.

As one of its important activities will be the dissemination of information to members it is intended that a regular feature in the Journal will be "Information Sheets" of this nature and of a uniform pattern so that they may be suitably filed. The information which will be included will relate to the publications of the S.A. Bureau of Standards, the National Building Research Institute, and "New Publications" of a scientific and technical nature pertaining to Architecture.

The Architectural Science Committee includes among its responsibilities the nomination of representatives to serve on outside bodies. The most extensive representation is on committees appointed by the S.A. Bureau of Standards which at the time of writing number twenty-six. For the

S.A.B.S. Ref. No.	Committee	Representative
15.2.2.9.	Safety Conditions in Factories.	W. E. Edleston. H. G. Summerley.
15.2.2.10	Food Hygiene.	M. Hermer.
15.2.1.11.	Lime.	D. S. Haddon.
15.2.6.1.	S.A. Softwood Timber.	H. G. Summerley. D. M. Cowin.
15.2.6.2.	Eucalyptus (Gum) Wood Blocks for Floors.	R. W. Skudder.
15.4.4.3.	Mastic Asphalts.	M. D. Ringrose.
	Civil Engineering Section (16.2)	
16.2.2.	Main Committee.	H. G. Summerley. (co-opted) Prof. J. Fassler.
16.2.3.	Preamble and Administration Committee.	H. G. Summerley. L. H. Fleming.
16.2.4.1.	Structural Aspects Main Committee.	Prof. J. Fassler (Institute). H. G. Summerley (Institute). J. S. Lodge (Chapter).
16.2.4.7.	Masonry.	M. Kirchhofer.
16.2.5.1.	Public Health, Accommodation and Amenities Main Committee.	H. G. Summerley (Chairman). B. S. Cooke; W. E. Edleston; Prof. J. Fassler; G. M. Hussey; (co-opted) F. Fels.
16.2.5.2.	Lighting, Natural and Artificial.	A. H. Murray. H. V. Marinier (alternate).
16.2.5.3.	Drainage and Water Supply.	L. H. Impey (Institute). G. P. Quail (Chapter).
16.2.5.4.	Ventilation and Air-Conditioning.	J. Watson; C. C. Irvine-Smith (alternate).
16.2.5.5.	Fire Protection.	H. G. Summerley (Chairman). W. E. Edleston (alternate).
16.2.5.6.	Urban Aethestics.	W. E. Edleston; K. S. Birch; B. S. Cooke; W. G. McIntosh; C. M. Sinclair.
16.2.5.7.	Advertising.	K. S. Birch; B. S. Cooke; W. G. McIntosh; C. M. Sinclair.
16.2.7.	Dwellings and Appurtenant Structures.	E. D. Andrews. A. H. Honikman.
16.2.14.	Sand Lime Bricks.	F. A. Fels.
16.7.3.	Protection of Buildings against Lightning.	C. C. Irvine-Smith. C. J. Pickett (alternate).
16.7.4.	White Enamelled Fireclay Sanitaryware.	L. H. Impey.
	Structural and Insulation Woodfibre Building Board.	F. A. Fels; (alternate) G. J. Strickland-Chomley.
	Hardwood Floor Blocks other than Gum.	P. J. L. Powell; (alternate) M. D. Ringrose.
	Waterproofing and Damp-proofing of Building Constructions.	M. D. Ringrose; P. Foley; H. B. Horrell; P. J. L. Powell.
	Glossary of Terms applicable to Timber, Plywood, etc.	G. Quail; (alternate) F. Fels.
	Specification for Steel Window Frames.	W. G. McIntosh. (alternate) M. Kaplan. J. T. B. Viljoen, M.C.Q.S. (alternate) P. B. Lee, M.C.Q.S.

information of members these are listed above together with the 33 Institute and Chapter members serving on them.

STANDARD SPECIFICATIONS

The following list of Standard Specifications published by the Council of the South African Bureau of Standards presents for the information of members the complete list of these relating to building and materials.

SPECIFICATIONS

Building Materials

Asbestos Cement Pressure Pipes, 286 : 1951.
Asphaltic materials for horizontal damp-proof-courses, 248 : 1950.
Bending dimensions of bars for concrete reinforcement, 82 : 1949 (2/-).
Black and galvanized (zinc-coated) mild steel sheets, 65 : 1944.
Burnt clay building bricks, 227 : 1950.
Chart supplement to S.A.B.S. 82 : 1949 (2/-).
Dimensional specification for refractory brick, 48 : 1949.
Doorlocks, standard sizes for, 4 : 1947 B.
Fireclay and silica refractories, 35 : 1949.
Flat and corrugated asbestos cement sheets, 21 : 1947.
Gypsum blocks, 52 : 1949.
Gypsum plasterboard, 266 : 1950.
Mastic asphalt for roofing, 297 : 1951.
Mastic asphalt for damp-proof-courses and tanking (for trowel and floor application), 298 : 1951.
Metal ties for cavity walls, 28 : 1950.
Mineral stabilized asphaltic roofing felts surfaced with finely powdered mineral matter, 92 : 1949.
Non-pressure concrete cylindrical pipes, 310 : 1951.
Salt-glazed ware pipes and drain fittings, 204 : 1950.
Sand lime bricks, 285 : 1951.
Water taps, 226 : 1950.

Electrical Equipment (Quality)

Cooking plates, electric, 154 : 1950.
Electric air heaters and radiators, 160 : 1950.
Electric stoves and hotplates, 153 : 1950.
Fixed electric storage water heaters, 151 : 1950.
Screwed steel conduit and fittings for electrical wiring, 162 : 1951.
Tungsten filament general service electric lamps, 56 : 1949.

Electrical Equipment (Safety)

Apparatus connectors for portable domestic appliances, SV 121 : 1950.
Domestic electric washing machines, SV 105 : 1950.
Electric radiators, SV 103 : 1949.
Electric stoves and hotplates, SV 117 : 1950.
Fixed electric water heaters, SV 105 : 1949.
Plugs, socket outlets and socket adaptors, SV 109 : 1950.

GENERAL

Hot application asphaltic compounds, 317 : 1951.
Protection against Lightning, 03 : 1952.
Stainless steel sinks, 242 : 1950.
The quality of effluents discharging from municipal, industrial, mining and private enterprises, 247 : 1951.

PAINTS

Basic carbonate white lead, 36 : 1948.
Basic carbonate white lead-in-oil, 44 : 1948.
Cold water distempers for interior use, 322 : 1951.
Chrome green pigments, 65 : 1949.
Dehydrated castor oil, 27 : 1948.
Linseed oil, boiled, 88 : 1949.
Linseed oil, raw, 86 : 1949.
Linseed oil, refined, 87 : 1949.
Non-reflective olive green camouflage enamel, 311 : 1951.
Raw tung oil for paints, 323 : 1951.
Red lead base primers for structural steel, 312 : 1951.
Red lead pigments for paints, 396 : 1952.
Yellow and orange chrome pigments, 64 : 1949.
Zinc chrome pigment, 294 : 1952.
Zinc chrome primer for non-reflective olive green camouflage enamel, 396 : 1952.
Zinc oxide for paints, 89 : 1949.

General

Paints

Timber

Acid cupric chromate for timber preservation, 43 : 1949.
Carbolineum and creosote for the preservation of timber, 17 : 1943.
Creosoted wooden telephone, telegraph, electric light and power transmission poles, 339 : 1951.
Eucalyptus gum wood blocks for floors, 340 : 1951.
Fluor-chrome-arsenate-phenol type of timber preservative, 37 : 1949.
Grade colour chart for use in connection with S.A.B.S., 1948 (1/-).
Graded South African soft wood timbers, 5 : 1948.
Metallic naphthenates for timber preservation, 38 : 1949.
Pentachlorophenol for timber preservation, 42 : 1949.
Zinc chloride for timber preservation, 39 : 1949.
Zinc meta-arsenite for timber preservation, 41 : 1949.

THE GRAND HOTEL, CAPE TOWN

Lightfoot, Twentyman-Jones and
Kent, AA.R.I.B.A., MM.I.A., Architects

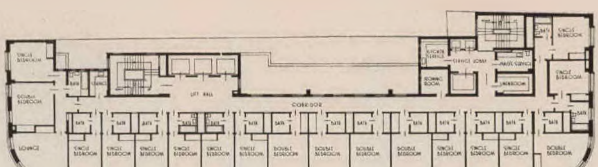
General view of the main entrance foyer. The walls are finished with light-veined pearl white marble; fittings are in Imbuia.

The private bar at first floor level. Panelling is Imbuia and curtains in deep Burgundy red. Note the egg crate ceiling to the service area.

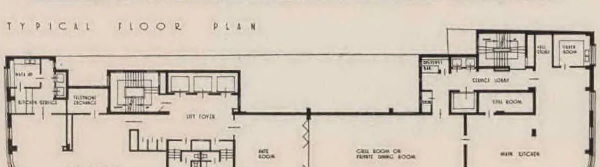
Below is a view across the ante-room looking towards the grill room beyond the "Modernfold" doors. The all-over carpet is deep wine and grey; curtains are oyster pink with ice blue; ceiling is an oyster shade; and light bowls are satin silver.

THE new Grand Hotel in Cape Town has now been completed. This new building replaces the old structure which has long been a landmark in the centre of the city. Bounded by Adderley, Strand and St. George's Streets, the site was an extremely limited one for a building of this nature, for while it is 192 feet long, it is only 47 feet wide. This limited depth has imposed some severe problems on the design of a building of so complex a nature as a modern hotel. In spite of this, however, the architects have succeeded in producing a compact plan with a minimum of waste space and providing all the usual and essential amenities of a first-class hotel.

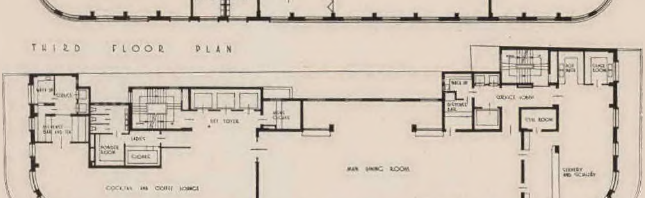
It is a re-inforced concrete frame building with brick panels. 4½-in. face brick exterior skin and 9-in. internal wall, with 2½-in. cavity between. It has Grey Paarl granite facings to ground floor with Namaqualand marble fascias above shopfronts. The shopfronts and entrance foyer doors are in bronze. The first-floor balcony is a cantilevered slab plastered on underside and painted pale green. Balcony floor and dadoes are terrazzo. Generally all elevations facing the three streets are finished with 2¼-in. facing bricks of multi-brown colour. Concrete surrounds to all windows are finished with Tyrolean plaster of light biscuit colour. The panels between windows in the feature over the entrance and those to second and third floor are in precast artificial stone. Windows are painted light ivory.



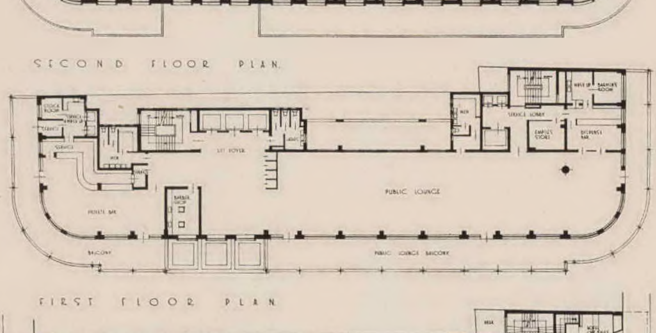
TYPICAL FLOOR PLAN



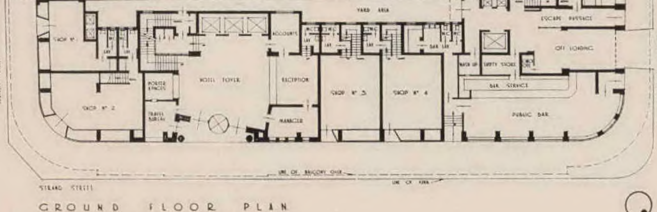
THIRD FLOOR PLAN



SECOND FLOOR PLAN

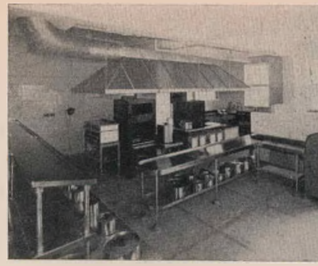


FIRST FLOOR PLAN



GROUND FLOOR PLAN

SCALE



(*Above*)—A view of the main kitchen at third-floor level.

(*Left*)—A view of the main dining-room at second-floor level. Bronze chandeliers are suspended from the acoustically treated ceiling. Furniture is in Imbuia, and velvet curtains tone with the hide upholstery.

ACCOMMODATION AND MATERIALS

The accommodation falls naturally into place on the various floor levels, as will be seen from the following detailed description.

Basement. Apart from the trading spaces for three of the ground floor shops the basement floor is set aside for the use of the hotel stores, mainly wine and liquor, with one large goods lift and four dumb waiters serving the upper floors. Pre-cooling chambers assure that the beers, etc., are cooled to required temperatures before delivery to the various bars and dispense bars above.

Ground floor. 1. Four modern shops (three with basements).

2. Grand Hotel Off-Sales with direct access to its own liquor store in the basement.

3. Hotel goods entrance—lorries delivering stores drive into an offloading bay so that goods can be checked before despatch by goods lift and dumb waiters to the required floors.

4. Public bar—planned in the same position as its predecessor but on more lavish lines, this bar has entrances from both Strand and St. George's Streets. Separate glass-washing and empties store accommodation have been provided behind the bar service with hatches through the back fittings to facilitate quick service. The back fittings, counter-top and shelving and built-in benches under the windows are carried out in teak while the walls are lined to a height of 4½ feet in pale cream terrazzo with a contrasting skirting and floor margin in black. The floor itself is covered with mottled green asphalt tiles. Lighting to the bar service is through an egg-crate ceiling thereby flooding the display of bottles and glasses in the back fitting with an even glow. Fluorescent fittings on the ceiling provide the remainder of the artificial light. A panel of glass bricks at the St. George's Street entrance has been incorporated to filter the rays of the late afternoon sun. A dartboard for patrons forms one of the features of this modern bar.

5. Entrance foyer—three bronze double doors, flanked by Cyprus green marble fluted columns give entrance to the hotel foyer which has been lined with lightveined pearl white marble, relieved by the dark Imbuia furnishings of the reception enclosure and porter service lodge. The lighting here is all indirect with the brightest light coming from the egg-crate ceiling over the reception enclosure to attract the visitor. Conveniently placed adjacent to the reception counter is a seating fitting with a floral display lighted from below giving a touch of bright colour to the coolness of the foyer. This fitting is positioned so that the clients dealing with the reception staff are not obstructed by the flow of visitors to the main stair or the three high-speed lifts serving the reception rooms on upper floors. The hotel manager and his office staff are adjacent to the reception enclosure with direct access to the foyer. Visitors also have access from the foyer to a travel bureau.

First floor. 1. Public lounge and balcony—almost three-quarters the length of the entire first floor—has banquette seating with low shaped tables in beech wood. As a contrast to the honey-coloured walls and ceiling the furniture is upholstered in floral green tapestry with the turquoise and old-gold curtains taking their tones from the flowers in the tapestry. Light oak wall-panelling provides an attractive background to the sunken floral displays in the corner radiator fitting. Dispense bars with refrigerator cabinets serve both the lounge and balcony. The lighting is by fluorescent fittings.

2. The private or saloon bar adjoining the public lounge carries the same tone of colouring above the Imbuia wall-panelling and has curtains of deep burgundy red. Here again as in the public bar the lighting to the bar service is by means of concealed lights above an egg-crate ceiling.

The mirrored bar fittings are carried out in Imbuia to match the wall-panelling with hatches through to glass-washing, empties store and supply accommodation. A service room supplies the needs of visitors using the balcony. In a case sunk in the wall-panelling are displayed relics of antiquarian interest recovered from the foundations whilst excavating for the new hotel.

Second floor. 1. Cocktail and coffee lounge—a room in which to enjoy a cocktail before or coffee after dining, served from its own dispense bar or small kitchen, is carpeted in Persian design with midblue and onyx green predominating—the curtaining taking up the latter colour. The wall-panelling is in Imbuia setting off the light Beech wood chairs and tables.

2. Ladies powder room and toilet.

3. The main dining room, which is of Cape Dutch character and proportions, is entered through the cocktail and coffee lounge. From an acoustically-treated ceiling hang old bronze chandeliers. Bracket lights of similar design are placed on the walls which have been stippled in tone with the high-backed golden hide chairs. Furniture and panelling is in selected Imbuia and the long velvet curtains also in tone with the hide give an effect of warmth and elegance. Adjoining the dining room is the kitchen with walls tiled in white to a height of 7 ft. and fitted with the latest cooking equipment and dish-washing machines. All the sinks and preparation tables are in stainless steel, kept 2 in. away from the walls to safeguard against the collection of dirt and grease. Fumes from the various cooking ranges, etc., are collected in the glazed hoods over and then drawn away by the exhaust ventilation system to be dispelled in the open air above roof level. Off the kitchen are pot-washing, still and silver rooms, fitted with sinks, cupboards, etc.

Mezzanine floor. 1. The reading and writing room has been located on this floor for quiet and seclusion.

2. Six staff bedrooms for housekeeper, etc.

3. Immediately over the dining room kitchen are the lock-up stores for dry goods and the coldrooms for meat, fish, milk, etc.

4. Waiters change room and ablutions with lockers for each waiter.

Third floor. 1. The ante-room and the grille room although two separate rooms have been treated and decorated as if they were one whole divided only by a modern collapsible folding screen. The "all-over" carpet is deep wine and grey patterned and the curtains are of oyster colour shot with ice blue silk and decoratively lit by the concealed lighting in the coved cornice. Indirect lighting floods the flush ceiling which has been painted an oyster shade in a fan-combed design. Satin silver lighting bowls of an interesting design are placed on the walls between the windows. Adjoining the grille room is the kitchen similar in its appointments to that serving the dining room and again provided with pot-washing, still and silver rooms. Nearby with convenient access to the grille room is a dispense bar for wine service.

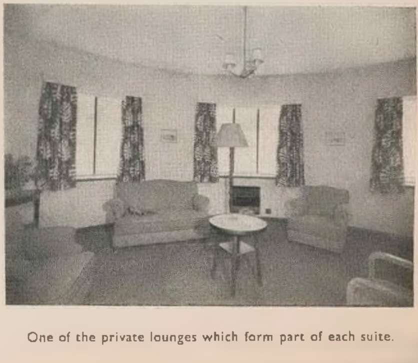
2. From the main lift foyer, opposite the ante and grille room, the residents have their own comfortably-equipped lounge with service kitchen to provide teas, etc. In this room the "all over" carpet is of Persian design and the settees and chairs are upholstered in French brocade. Long curtains in Eud-de-nil damask with coral-coloured flowers tone with the Eud-de-nil walls. A decorative feature are the Imbuia-panelled walls surrounding the hidden service ducts. French old gilt chandeliers and wall brackets complete the decor in this room.

3. Ladies and Gents lavatories.

4. Public telephones.

5. Telephone exchange.

Fourth to Ninth floors. Apart from the staff dining rooms for non-Europeans, Indian waiters, chambermaids and European males situated on the fourth floor these floors are entirely set aside for suites, double and single bedrooms, with a bathroom to each suite and bedroom. To provide for the needs of the residents there are rooms for ironing and linen, housemaids and tea service. The bedrooms and suites are not regimented. Here thought has been given to the requirements of the guest, such that, should he or she be a regular visitor a bedroom or suite will be available that will probably be different from the one occupied during an earlier visit. The tones selected are such that the appeal is immediate, the curtains, bedspreads and upholstery all match. The furnishings are comfortable, each bed is fitted with Dunlopillo mattresses, the dressing tables are of an unusual but practical design. The furniture is all in light Oak. Built-inward robes with sliding doors eliminate the usual space lost by wardrobes fittings with folding doors, and over each wardrobe is found a separate cupboard for luggage storage.



One of the private lounges which form part of each suite.

(*Above*)—A typical bathroom. Each bathroom is provided with its own private facilities.

(*Right*)—One of the double bedrooms. The curtains, bedspread and upholstery all match. Each bed has a Dunlopillo mattress, and furniture is in light Oak. Each bedroom has a built-in wardrobe.

The lighting of each room is by a centre light fitting as well as bedside and dressing table fittings. The bathrooms are compact but provide all the essentials and have a system of exhaust ventilation that ensures the absence of fogging on the mirror from the steaming hot water instantly obtained on turning the hot tap.

A single bedroom, facing St. George's Street, finished like the double rooms.

Tenth floor. 1. Five maids bedrooms, large enough to accommodate two maids per bedroom with built-in wardrobe fittings and basins.

2. Chambermaids' changeroom and lavatories are provided for those maids not living in.

3. Native dormitory to accommodate 32 boys in double-decker bunks with their lavatories and washrooms. For the three head boys a separate room has been provided.

4. Hotel laundry fitted with the most modern equipment for laundering the hotel linen, etc.

5. Above the laundry on the roof is located the boiler room which supplies the hot water throughout. To ensure the constant supply of water during the possible break in municipal supply a 10,000-gallon reserve tank has been located on the roof of the boiler room.

Grand Hotel Photography | Robin Summers.

SUB-CONTRACTORS FOR THE GRAND HOTEL

Chubb Reinforced Concrete Co. (Re-inforcement); J. A. Strauss (Cartage, Sand); Express Lift Co. (Passenger nad Service Lift Equipment Installation); National Quarries (Pty.) Ltd. (Stone); Evans & Plows Ltd. (Plumbing and Drainage); Crammix (Pty.) Ltd. (Golden Brown Face Bricks); Lupini Bros (Pty.) Ltd. (Pre-cast Stone Facing and Terrazo); Buildrite Brick Co. (R.O.K.'s); Crittall-Hope Metal Windows (Steel Windows and Roller Shutter); Purcell, Yallop & Everett Ltd. (Woodblock Flooring, Timber and Joinery); Thos. Pattullo (Plastering); J. Clark Bruce (Painting); Byers & Falconer (Glazing); Arderne Scott Timbers Ltd. (Waterproofing, Timber, Joinery and Sliding Door Gear); Austin & Aldridge Ltd. (Sanitaryware); E. A. Shaw & Co. (Pty.) Ltd. (Electrical Installation); Cape Brick Co. (Clinker Cement Bricks); Frank Wright (Cape) (Pty.) Ltd. (Asphalt Floor Tiles and Synthaprufing); Mills Scaffold (Steel Scaffolding); Gypsum Industries Ltd. (Flush Ceilings); G. Lovric & Son (White Glazed Tiling); M. B. Koval & Co. (Hot Water Boiler Plant); M. Michaels & Co. (Shopfronts, Entrance Doors and Internal Fittings); S.A. General Electric Co. (Air-Conditioning Equipment); Cape Town and District Gas Co. (Gas Service Installation); Southern Timbers (Pty.) Ltd. (Joinery); B. Chapman & Co. (Built-in Cupboards, Counters and Off-Sales Fittings); Thos. Crawford (Pty.) Ltd. (Linoleum); Mather & Platt (S.A.) (Pty.) Ltd. (Fire Protection Services); Associated Engineers (CO^2 Fire Extinguishers); G. Findlay & Co. Ltd. (Hardware); Allied Concrete & Plaster Supplies (Hollowcrete Units); Conway & Co. (Locksets); Jamieson, MacFarlane & McKillops (Granite Work and Marble); Plywoods Ltd. (Flush Laminated Doors); H. G. Skelton (Ventilation System and Electrode Boiler Switchgear); Cape Ornamental Ironworks (Service Stair Balustrade); Atomic Welding Engineers (Wrought Iron Balustrading and Pot and Plate Racks); Protea Timber Co. (Joinery); Harold Green & Co. (Joinery); Barlows Ltd. (Refrigeration Equipment); Wynberg Joinery Works (Joinery); Albert Moore (Pty.) Ltd. (Stainless Steel Fittings); Patchett Steel Constructions (Water Tank); Chubb & Maxwell Ltd. (Hardware, Strongroom Door and Modernfold Door); Waud & Brackman Ltd. (Red Quarry Tiles); Marble Lime Co. (Marble); S.A. Vermiculite (Vermiculite); Jack Benson & Co. (Ceiling Brandering); Modern Shopfitters (Joinery); R. W. Bartle & Co. (Joinery); Richards & Barlow Ltd. (Copperlite Glazing); Dorman Long (Pty.) Ltd. (Structural Steelwork); H. G. Holliday (Panelling to Residents' Lounge); City Engineering Works (Fire Escape Railing); H. G. Stephens & Son (Bar Footrails & Bronze Letters); Bartle & Co. (Geared Crawl); Stewart & Lloyds (Flag Poles); William Vye & Co. (Signs); Arno Metal Industries (Window Guards); Marks Engineering (Stainless Steel Fittings); Schaltema & Co. (Slate); Plastic Developments (Number Plates); Plate Glass Bevelling & Silvering Co. (Mirrors).

CONTEMPORARY JOURNALS

COMPILATION BY UGO TOMASELLI

APARTMENTS

Architectural Forum. March, 1952. pp. 142-145.

Le Corbusier's Marsailles Apartments. A group of experts appraise the success of Europe's most controversial building—a radical departure from accepted apartment house design which measures 450 feet long, 66 feet wide and 185 feet high.

ARCHITECTURE

Architectural Review. September, 1952. pp. 143-155.

Henry van de Velde, one of the pioneers of modern design, will be celebrating his ninetieth year in 1953. It is well known that he is a painter and turned to architecture when the necessity for designing his own house arose. The Review presents extracts from his forthcoming memoirs (translated by P. Morton Shand) in which van de Velde himself fills in the details of his life and career during the 'nineties.

Architectural Review. September, 1952. pp. 165-172.

Pimlico Squares, by Gordon Cullen. In a previous issue the point was made that there are as many different ways of treating a square as there are tastes. The average London square has in recent years become the victim of a standard treatment. But how should they be treated? The answer depends largely on the environment, the sort of buildings that surround the square, how much traffic flows past it, and whether the square is in a business or residential site. In this feature, Gordon Cullen takes five actual squares in Pimlico and shows how they vary in character from the ornamental square to domestic precinct, and suggests the right treatment for each.

House and Home. July, 1952. pp. 102-107.

Advice to the appraiser. This is the second of a series of articles giving advice to the general public on how to rate a house.

COMMERCIAL

Progressive Architecture. March, 1952. pp. 96-106.

Architect's offices:—

1. Office for the firm, Six Associates Inc., in Asheville, North Carolina, designed to house a total staff of 45 persons.

2. Associates' office in Memphis, Tennessee. An interesting design to house a draughtsmen's room for 14 boards, three private offices, a conference room, reception-office space and ample storage and utility areas.

3. Office and home in Havana, Cuba, for architects Nicolas and Gabriela de Arroyo.

Architectural Forum. March, 1952. pp. 99-107.

Shockproof office building in Tokyo, designed to withstand Japanese earthquakes, combines novel structural system, open planning with Japanese gardens. Architects: Antonin Raymond and Rado.

Architectural Forum. March, 1952. pp. 126-132.

1. Seattle Park Administration Building, designed by architects Young and Richardson, on the modular system for flexibility. An interesting, informal and dignified building.

2. A remodelled bank in Rockefeller Centre. Architects: Carson and Lundin.

Architectural Forum. February, 1952. pp. 108-116.

Three interesting small offices are illustrated, designed by architect M. Pei, and architect Richard Neutra.

Architectural Forum. February, 1952. pp. 126-133.

Down-town department store, Rich's Inc., in Atlanta, counters the decentralisation trend with new ideas in urban store design. Architects: Stevens and Wilkinson.

DOMESTIC

House and Home. July, 1952. pp. 68-79.

1. Architects Cowell and Neuhaus design a house on the Roman prototype. It offers complete privacy on a corner lot. This luxurious house combines a measure of simplicity, orderliness and serenity with an interplay of closed and open spaces, brick walls and glass screens, cool colours and warm sunlight, formal structure and informal planting.

2. A three-level house by architect Mario Corbett. This house offers privacy as well as openness. It won the National A.I.A. Certificate of Merit.

Progressive Architecture. March, 1952. pp. 83-87.

House in Atlanta, Georgia, designed for a family of five on a beautifully wooded seven-acre site. Architects: Moscowitz, Willner and Millkey.

Progressive Architecture. February, 1952.

House in Carmel, California, designed by Gordon Drake.

House and Home. February, 1952. pp. 67-97.

1. Raphael Soriano designs a garden apartment with skill, taste and imagination. Each apartment retains an extroverted unwalled quality in addition to privacy. This is achieved by planting small gardens, terraces, galleries and courts to each apartment, and by the use of gay colours, luminescent plastic screens, and smart use of site. This house is magnificently illustrated by means of coloured photographs, plans and facades.

2. Mezzanine houses designed by Wurster, Bernadi and Emmons to embrace San Francisco's sun and view. Two-storey walls of glass open up dramatic interior space to outside views.

3. Mario Corbett designs a mazzanine house in black, white and grey in Sausalito, California.

House and Home. May, 1952. pp. 102-115.

The work of the great architect Marcel Breuer is discussed under the following headings: (*i*) teacher and architect; (*ii*) his plans are sub-divided according to use; (*iii*) his materials soften a stern geometry; (*iv*) his colour accents are bright; (*v*) his stairs and fireplaces are sculpture; (*vi*) his detailing is consistant, his open spaces are intimate; (*vii*) his houses reach for a view of nature.

House and Home. May, 1952.

Open-plan apartments in Honolulu, designed by Johnson and Perkins.

LANDSCAPE AND GARDEN DESIGN

Architectural Forum. March, 1952. pp. 108-111.

Japanese gardens: the oriental art and technique of garden design can improve landscaping of buildings in other countries just as Japanese architecture has influenced their design. This article is fully illustrated.

HOSPITALS

Architectural Forum. March, 1952. pp. 112-119.

Three small hospitals are illustrated:—

1. A 33-bed desert hospital in Palm Springs is both homely and friendly and is designed around a typical Californian patio. Architects: Williams, Clark and Frey.

2. A 21-bed prairie hospital in Wheaton, Minnesota. Architects: Thorshov and Cerny.

3. A 25-bed hospital in Pelican Rapids, Minnesota. An interesting and compact building unit designed by Thorshov and Cerny.

Architectural Forum. February, 1952. pp. 116-123.

Huston's new Cancer Hospital designed by Mackie and Kamrath previews the effect of new radio-therapy methods in hospital design.

NOTES AND NEWS

CHAPTER OF S.A. QUANTITY SURVEYERS

MEMBERSHIP

New registrations as practising members include the following: Mr. R. C. Chittenden, Johannesburg and Mr. W. C. King, Umtali, Southern Rhodesia.

New registrations as salaried members include: Mr. B. V. Borland, Durban; Mr. E. D. Bower, Johannesburg; Mr. A. Coetzee, Johannesburg; Mr. P. F. Dreyer, Cape Town; Mr. H. Lawrence, Cape Town; Mr. J. D. Nel, Cape Town; Mr. J. O. Welsford, Odendaalsrus.

TRANSVAAL PROVINCIAL INSTITUTE

MEMBERSHIP

New registrations as practising members include: Mr. K. W. J. Anderson, Johannesburg; Mr. A. O. Endres, Johannesburg; Mr. J. L. Gauldie, Salisbury, Southern Rhodesia; Mr. S. Gelgor, Johannesburg; Mr. A. Jacobsen, Johannesburg; Mr. P. Moir, Johannesburg; Mr. H. R. Shapiro, Johannesburg; Mr. A. P. Voutsas, Pretoria.

New registrations as salaried members include: Mr. P. T. Fourie, Pretoria; Mr. D. O'Brien Brown, Johannesburg; Mr. H. M. J. Prins, Johannesburg.

TRANSFERS

Practising to Absentee Practising: Mr. L. W. Baart, Mr. M. E. Vickery.

Absentee Practising to Practising: Mr. N. J. Harris, Miss C. Klempman.

Salaried to Absentee Salaried: Mr. H. J. C. Pilkington, H. M. J. Prins.

Absentee Salaried to Salaried: Mr. M. B. Hartley, Mr. F. H. Vermeulen.

Salaried to Practising: Mr. K. Grossman, Mr. D. H. Robinson, Mr. H. Stern.

Practising to Salaried: Mr. E. G. Tucker.

Transfer from C.P.I.A. to T.P.I.A.: Mr. J. Watson.

Transfer from N.P.I.A. to T.P.I.A.: Mr. A. F. Lawrie.

Transfer from T.P.I.A. to N.P.I.A.: Mr. M. B. Hartley; Mr. R. J. Nicholas.

PARTNERSHIPS

Mr. M. Siew and A. Axelrod have dissolved association. The partnership known as Stucke, Harrison and Smail was dissolved on 31st December, 1917, and a new partnership known as Stucke, Harrison, Ritchie and Watson was formed.

Mr. K. J. Jooste joined Mr. P. R. Nel as junior partner, the partnership is known as P. R. Nel, Architects.

Mr. K. W. J. Anderson joined Mr. Brendan Cluich in a partnership Brendan Cluich and Anderson.

Mr. John Boyd has joined the firm Harold Porter and Partners in their Welkom office.

Mr. P. D. Haysom has joined the firm Harold Porter and Partners in their Kimberley office.

Messrs. Hennar and Eliasor have entered into partnership and are practising at Vereeniging.

DECEASED

Mr. B. H. Sauk of the Pretoria University School of Architecture died suddenly on the 10th April, 1952.

OBITUARY

THE LATE MR. J. H. FARROW

Mr. J. W. H. Farrow, of Messrs. Farrow, Stocks and Farrow, chartered architects, East London, was born in England in 1878. He was trained in a private office and worked in London for various architects, including Sir Bannister Fletcher. He came to East London early in 1903 to join Messrs. Cordeaux and Walker, and later went to King William's Town in charge of their practice there. He returned to East London and, in association with the late Mr. H. J. C. Cordeaux, was responsible for much of the early work throughout the Border districts.

From 1915 to 1919 he served with the 2nd South African Infantry Brigade in Egypt and France.

In 1925 Mr. Farrow was joined by the late Mr. C. W. B. Stocks and the firm, known then as Cordeaux, Farrow & Stocks, built up an extensive practice in East London and in the whole of the Border and Transkeian territory. The partnership was responsible for many public buildings, banks, colleges, hospitals and schools and produced winning and placed designs in a number of competitions.

Cultured, of strong character and kindly disposition, Mr. Farrow was regarded with affection and respect by his colleagues and all those with whom he came in contact. His death occurred after a short illness.

ALPHABETICAL INDEX OF ADVERTISERS