



DEPARTMENT OF PUBLIC WORKS

MANUAL FOR CONSULTING

STRUCTURAL ENGINEERS

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A GENERAL PROCEDURE

A1. THE MANUAL

The purpose of this Manual is to serve as a guide to the functions, duties and responsibilities of Consulting Structural Engineers in the design, documentation and administration of building and other related projects for the Department. You are required to execute your work in accordance with this Manual and with such supplementary instructions as the Department may issue from time to time.

A2. THE CLIENT

The sole client for the work is the Director-General: Department of Public Works (hereinafter referred to as the Director-General) or his authorised representative.

As Consulting Structural Engineer your dealings with the client will be conducted through the Departmental Representative (Project Manager) as set out in this Manual, and your letter of invitation / confirmation and any Annexures thereto.

A3 THE PRINCIPAL AGENT

A3.1 In the case of most building intensive services, the Architect will act as the Principal Agent of the Department in terms of this appointment and will co-ordinate the work of the consultant team. Before he submits his proposals he must ascertain the requirements of all other disciplines and incorporate them in his drawings.

A3.2 if so decided by the Department, the Structural Engineer will act in all matters as the Principal Agent of the Department and will co-ordinate the work of the consultant team if more than one engineering discipline and/or other disciplines are involved. Your additional duties will be further described elsewhere in this Manual. The Principal Agent will be designated by the Department at the appointment stage.

A4 FIRMS IN ASSOCIATION: RESPONSIBLE MEMBERS

A4.1 In the case of firms appointed in association as Structural Engineers, you are asked in your letter of appointment to agree, together with the other members, to the nomination of a representative of the Group for the purpose of liaison with the Department.

A4.2 The Department reserves the right in certain instances to nominate the members of the association it wishes to act as representative of the Group.

A5. PROGRESS REPORTS

Monthly Reports, a copy of which is attached at Annexure A 1, are required from you from the time of our appointment. These reports must be submitted regularly and without fail whether or not it has been possible to progress with the design. They must reach the Departmental Representative not later than the third day of each month.

A6. THE CONSULTANT TEAM

A6.1 Appointment of Consultants

All specialists comprising the consultant team are separately appointed by the relevant Departmental Representative and are briefed by him in respect of their terms of agreement, departmental standards and the technical aspects of their work. In all other respects they will be briefed by the Principal Agent.

A6.2 Liaison between Consultants

In terms of their several agreements, all members of the consultant team are required to liaise very closely with one another during all stages of the project and to keep each other fully informed of all relevant developments.

A6.3 Routing of enquiries

Consulting Engineers are required to channel all enquiries to the Departmental Representative, with a copy to the Architect or Principal Agent where applicable.

A6 4 Responsibility for changes

You must bear in mind that where changes to the design or documentation occur without the prior written authority of the . Department, and these changes involve work done by other consultants being discarded in such a manner as to involve fruitless expenditure, the responsible party will be held liable to defray the costs of such expenditure.

A7 THE DRAWINGS

A7.1 Issue of drawings

All drawings are to be issued through the Departmental Representative.

A7.2 Sizes of drawing sheets

The following drawing sheet sizes are to be used for the preparation of structural drawings:

DESIGNATION	<u>SIZE IN mm</u>
A0	841 x 1189
A1	594 x 841

It is desirable that only one of the above sheet sizes be used for any one particular service.

A7.3 Layout and information

Information concerning layout of drawing sheets with regard to the Title Block is to be obtained from the Departmental Representative.

The 100 mm wide space incorporating the Title Block on the right hand side of the sheet extends the full height of the sheet i.e. up the top border line. The remainder of the space above the Title Block must be used only for notes, revisions and variations.

Notes to appear in numerical sequence, starting from the top of the sheet. (Reading from top to bottom).

Revisions and variations to appear immediately above the Title Block, with subsequent entries following above in order of date sequence. (Reading from bottom upwards).

Scales to be used

Working drawings	1:100	(only to be used with prior approval)
	1:50	
	1:20	
Site Plans	1:500	
	1:200	
Details	1:10	
	1:5	
	1:2	
	1:1	

A7.4 NUMBERING OF DRAWINGS

A7.4.1 ALLOCATION OF DRAWING NUMBERS

With the object of obtaining uniformity in the method of allocating drawing sheet numbers and also to maintain a simplified numbering system, structural drawings must be numbered as follows:-

- (i) The main drawing number furnished by the Department must be denoted by the prefix S. and the drawing sheets must be numbered consecutively starting from number 1, e.g. S.6148/1. S.6148/2, S.6148/3etc.
- (ii) A complex layout is usually divided into blocks and the same alphabetical numbering of the blocks as shown on the architect's drawings should preferably be used for the structural drawings e.g. S.6148/A/1, S.6148/A/2, S.6148/A/3 etc. or S.6148/B/1, S.6148/B/2, S.6148/B/3 etc. for drawings relevant to block B.

On no account must the sheet number be followed by a letter of the alphabet.

The numbering must be consecutive including the steel schedules, avoiding the omission of any number, as this leads to confusion and endless queries from all parties concerned with documentation, and from the contractor.

- (iii) The Consultant's private drawing numbers must not appear in the official Title Block, but may be shown elsewhere on the drawing.
- (iv) Should the number of drawings exceed 10 an index sheet must be prepared indexing all drawings. This sheet shall be numbered S/...../0.
- (v) Key Plans

These must appear on all layouts in the following cases:-

- (a) Additions, extensions and alterations to existing buildings.
- (b) Building complexes consisting of more than one building.
- (c) Buildings where more than one layout is used per floor area.

The key plans must show the shapes and relative positions of all the buildings / parts of building, together with a North point. The portion of the key plan referring to the particular layout must be hatched.

- (vi) At the completion of all services an index drawing is to be submitted listing all as built drawings.

A7.4.2

AMENDMENTS AND REVISIONS

When drawings are altered or amended during the planning stage, i.e. before the Quantity Surveyor has completed his measuring, the word "Revised" followed by the date of the revision, must be added in the remarks column immediately above the Title Block on the drawing sheet, followed by a short description of the revision or amendment involved. This will simplify locating the altered detail on the drawing.

The suffix VO. Must not be added to the drawing number, neither must the sheet number be followed by any letter of the alphabet.

The above annotation of the amendment(s) must be removed from the drawing before the polyester original is issued as part of the contract documents.

A7 4 3

VARIATION ORDERS

When alterations or amendments to a drawing are necessary after the Quantity Surveyor has completed his measuring, the revised drawing must be designated VO.

Please note that at this stage:

- (i) No erasures must be made on original drawings.
- (ii) Cancelled original drawings must not be destroyed.

- (iii) The suffix VO 1 for the first variation must be added to the drawing number and subsequent variations must be designated VO 2, VO 3 etc.
- (iv) All variation orders must be listed in the variation column above the Title Block, commenced by the letters VO and the appropriate VO number followed by the date and short description of the omissions and/or additions in respect of the variation concerned.

In order to simplify locating the altered details on the drawing and for the sake of clarity, the letters (VO 1) or

(VO 2) etc. must appear in brackets next to, or in close proximity to, the alterations.

The requirements in respect of variation order drawings, are illustrated in Annexure A 12.

Where new drawings are prepared after completion of the Bill of Quantities, these drawings will also be designated by means of VO, the description being VO 1 etc. First Issue.

A7.4.4

GENERAL

The alterations referred to in A 7.4.2 and A 7.4.3 above, must be indicated in such a manner that together with the relevant short description in the remarks column, these alterations may be readily identified on the drawing.

The drawing numbers of the relevant architectural, electrical, mechanical or any other variation order drawings involved, must be mentioned at the end of the description e.g.

"Refer to architectural drawing No 18134/13VO 1 April 1973".

or

"See mechanical drawing No ME 1001/5VO dated 5th June 1973" etc.

Alterations relevant to subsequent variations must be distinguishable from those related to previous variations, and at all times such details must be indicated in an unambiguous manner.

All variations on polyester originals are to be effected in Indian ink, pencil work not being acceptable.

Coloured ink on the original drawings must not be regarded as an aid for identification purposes, as colours do not show up on prints produced from such drawings.

The Departmental Representative must be consulted and his approval obtained before commencing the preparation of Variation Order drawings.

A paper print of the Variation order drawings must be submitted to the Departmental Representative for comment / approval before general distribution, after which a polyester must be forwarded to the Sub-directorate: Structural Engineering Services for record purposes.

A7.5

SUPPLY OF PRINTS

A7.5.1

POLYESTER PRINTS

All working drawings can be drawn on any suitable material initially, but shall be reproduced by the Engineer on sensitised polyester-based material having a thickness of 0,05 mm. The Engineer must ensure that the quality of these prints is such that a further polyester print made from the original polyester print is of such clarity as to enable clear paper prints to be made therefrom.

A8.

THE USER DEPARTMENT

The designated occupant(s) of a building is/are the User Departments). Any discussions which you may wish to have with a User Department must be arranged through the Departmental

Representative. Any requests from the User Department for increased accommodation or for an item involving additional cost must be referred by the User Department to the Director General. Department of Public Works and his written authority obtained before incorporating such additions in your design proposals.

A9. APPROVAL

A9.1 Until formal approval has been given by the Departmental Representative in writing to proceed with the preparation of working drawings, the Department will not entertain any claims for additional payment for any changes which may have to be made thereto.

A9.2 After the sketch plans prepared by the Principal Agent have been approved by the Department, no alterations will be made thereto without approval in writing by the Director-General.

A9.3 Approval of drawings either verbally or in writing by a User Department is not binding on the Director-General and does not relieve you from your responsibility for obtaining written approval from the Departmental Representative.

A10. SUBMISSION OF ACCOUNTS

A10.1 Form of Submission

All accounts must be submitted on the forms provided, Annexure A10 to A10 of this manual, and must be accompanied by invoices where relevant. Use only the appropriate Annexures (A4 to A10) under cover of Annexure A3, and fill in only the appropriate portions of the form.

A10.2 Claims for subsistence and travelling

Such claims must be submitted as soon as possible after the journey has been made and in no circumstances later than three months after the date thereof.

A10.3 Claims for other disbursements

Such claims must be submitted as soon as possible after the event or as soon as you receive receipted invoices, preferably monthly.

A10.4 Fees on Contract Price Adjustments

Your attention is drawn to the provisions of Regulation 3.2.3.4.2 of Government Notice R1113 as amended, which limits the amount of Contract Price Adjustment on which design fees may be claimed to 10% of the Tender Price.

A10.5 Payment of Claims

You are requested to note that the Department may apply the Prescription Act of 1969 as amended.

A11. SUPERVISION

You will be required to carry out inspections during the construction of the works in accordance with clause 3.1.1.4.7 of Government Notice No R1113 of 11 June 1982 as amended. Should the Departmental Representative require further assistance in the form of additional inspections over and above that required under clause 3.1.1.4.7, an application must be made by you in writing to the Departmental Representative setting out the estimated number of additional site visits required and the cost thereof.

B REPORT AND PRELIMINARY DESIGN STAGE

B1. FOUNDATION INVESTIGATION

The Departmental Representative will supply the Consultant with drawings showing the final position of the buildings to enable him to arrange as follows for a foundation investigation to be carried out if deemed necessary.

The Consultant must obtain three quotations, if possible, for the digging/drilling of test holes as well as in-situ testing, the taking of samples and their despatch to the Structural Laboratory at the above address.

A print of the site plan indicating the positions of the holes in relation to the buildings together with his recommendations regarding the acceptance of a tender, must be forwarded to the Departmental Representative for consideration. The Consultant must ensure that the trial holes do not interfere with existing services.

Laboratory test, if considered necessary, will normally be carried out by the Department's Structural laboratory in Pretoria and Consultants should contact the Departmental Representative in this regard.

After completion of the investigation, consulting Engineers are requested to submit the account to this office. Invoices of third parties, certified by the Consultant must be attached but the account must appear under his letterhead. Payment will thus only be made to the Consultant.

The Consultant must note however that the profiling and logging of holes, the interpretation of the laboratory results and the compilation of the report form part of his duties under the Agreement.

If requested, the Consulting Engineer must furnish the necessary information regarding estimated percentages of soil, soft rock and hard rock respectively to the Quantity Surveyor, via the Architect if applicable.

B2 CONCEPT AND SKETCH PLAN STAGE

Where an Architect is involved the Consultant shall co-operate with him to prepare concept and sketch plans in terms of his commission, keeping in mind that economy is of prime importance.

As this is the most important stage of the planning, the Consultant must ensure that he maintains constant liaison with the private Architect to ensure that the architectural scheme does not proceed too far without adequate structural advice.

If any problems are encountered in this respect the Departmental Representative must be advised without delay.

Line drawings and a report outlining his structural proposals i.e. whether buildings are to be framed, type of foundation, and whether any economy can be effected by variations to the architect's proposals etc. Must be submitted to Departmental Representative at least 14 days prior to the Architectural Steering Committee meeting.

In certain cases more comprehensive sketch plans will be required from the Consultant.

The Engineer must advise the Department in writing should temporary or permanent underpinning, lateral support or shoring of adjoining buildings or properties be necessary.

B3. DESIGN CRITERIA

All structural designs are to be based on the latest relevant S A B S Codes of Practice.

Consulting Engineers may as an alternative make use of the Standard Building Regulations (Act 33 of 1962) as amended.

The Department's General Specifications PW 371, as well as Annexure A 2 to this manual (the design stress to be used), takes preference over any of the foregoing where applicable.

B3.1 Statutory Requirements

All town planning regulations and such related by-laws, National Building Regulations and the Occupational Health and Safety Act must be strictly adhered to unless otherwise formally agreed to by the Department.

B4. RESPONSIBILITY FOR DESIGN

Acceptance of the design by the Department shall neither imply that the work has been checked in detail nor relieve the Consulting Engineer of any of his responsibility for the design.

C WORKING DRAWING STAGE

C1. COMMENCEMENT

The Consulting Engineer is not to proceed with working drawings until officially advised in writing by the Departmental Representative, after which he must proceed with his working drawings without delay according to S A B S 0143 - 1980, S ABS 0144 - 1978 and Clause A 7 of this manual.

C2. PREPARATION OF WORKING DRAWINGS

The following requirements must be adhered to:-

- (i) All drawings shall be clear and legible and shall be fully dimensioned so that reference to the Architect's drawings is unnecessary;
- (ii) lay-out plans shall be prepared and drawn to a scale of 1:50 in 50 showing dimensions for setting-out and sizes of beams, slabs, columns, footing, etc. The North point must be indicated in the bottom right hand corner of every lay-out. Foundation pressures and superimposed loading must be indicated on the plans:
- (iii) details and sections of beams, columns, foundations, staircases and similar construction shall be drawn to be scale of at least 1:20.
- (v) Reinforcement details of slabs may be superimposed on a transparent print of the structural lay-out plans;
- (iv) bar-bending schedules, enumerating all bars and stating over-all lengths, diameters and fully dimensioned bending diagrams, not necessarily to scale, or shape codes must be furnished by the Engineer. These must be compiled on standardised drawing sheets and not on foolscap sheets;
- (v) fully dimensioned structural steelwork details, showing all connections, splices, truss shoes, bases and special construction, sizes of members and constituent parts, sizes and spacing of rivets, bolts and welds, sufficient for the preparation of workshop drawings without further reference to the Consulting Engineer. These drawings shall be to a scale of 1:50 for lay-out plans, 1:20 for elevations and 1:10 for details;
- (vi) the Engineer is not required to furnish a general specification for the structural work. but must furnish a specification of any special items and materials, procedures of work to be followed and any other information as may be necessary to convey fully and completely to the Contractor the complete intention of the Engineer. Unless the prior approval of the Department is obtained proprietary articles may not be specified;
- (vii) where provision has been made for future extensions, this is to be clearly indicated by notes and sketches on the index drawing;
- (viii) items normally excluded from the Consultant's brief and not to be shown on his drawings, include conventional timber trusses and beams, conventional wall footings, surface beds, lintels covered by the Department's General Specification PW 371, roads drainage and paving;
- (ix) a senior partner must scrutinise all drawings and details and initial the right bottom corner of the Title Block accordingly;
- (x) on completion of all reinforced concrete and structural steel lay-outs, one paper print of each shall be forwarded for possible comment/approval to Departmental Representative. This is to be followed by the typical reinforcement details for the same purpose, unless otherwise requested;

- (xi) The Consultant Engineer shall under no circumstances whatsoever carry out alterations to the working drawings with a building cost and /or professional fee implication without the prior approval of the Departmental Representative.

C3 DESIGN CALCULATIONS

Calculations must be submitted at completion of working drawings on sheets of paper, size A4, bound in suitable folders or files of size 320 x 240 mm with a spine width of 30 mm maximum. For the cover inscription see Annexure A13.

D ADMINISTRATION AND SUPERVISION AS PRINCIPAL AGENT/LEADER OF THE TEAM

D1 CONTROL BY THE CONSULTING ENGINEER

D1.1 Functions

D1.1.1 As Principal Agent you are responsible for the administration and in conjunction with the Regional Representative, for financial control of the building contract, with interpretation to the Contractor of the intent of the design and documentation and with the quality control of workmanship and materials.

D1.1.2 Your functions in respect of the administration of the contract and supervision of the works are laid down in Government notice R1113 dated 11th. June 1982, and any amendments thereto, and in the following paragraphs:

D1.2 Tendering Procedure

Calling for and acceptance of tenders is a function of the Department. You may, however, be called upon to compile a report on the tenders received.

D1.3 Administration of the Contract

In order to administer the contract efficiently, you are required to acquaint yourself thoroughly with the Departmental Conditions of Contract and to ensure that the consultant team do likewise.

D1.4 Contractual Functions

D1.4.1 Your attention is drawn to the fact that, in terms of the Conditions of Contract, certain functions are reserved for the Director-General, such functions comprising:

approval of variation orders

nomination of Sub-contractors

release of the securities

extension of the contract period

application of penalties and the termination of the contract

various actions should the Contractor be in default

work charged as day-work.

D1.4.2 If the Contractor claims an extension of time in terms of the relative clause of the Conditions of Contract, you must prepare a recommendation thereon and submit it in writing, together with

the contractor's claim, to the Departmental Representative, who will make his own comments thereon.

D1.4.3 Your assistance in the form of reports/recommendations will be required with regard to any of the other matters named in D1.4 hereof. Your Reports/Recommendations must be submitted to Departmental Representative.

D2. HANDING OVER OF THE SITE

It shall be the prerogative of the Departmental Representative on behalf of the Director-General, to conduct the handing-over-of-site meeting and he will be responsible for taking and issuing the minutes of this meeting only. You will be advised by the Departmental Representative of the time and date of the meeting and your attendance will be required. Subsequent meetings shall be chaired by you and the taking and distribution of minutes thereof shall be your responsibility, all as described in D8 Hereof.

D3. CONSTRUCTION PROGRAMME

D3.1 Programme to be submitted by the Contractor

The Contractor is required, immediately upon the site being handed over to him, to prepare and submit to you a detailed construction and cash flow programme, taking into account all trades and aspects of the works and allowing for any procedure requirements. When you are satisfied that the programme is adequate you must submit a copy to the Departmental Representative, and other parties concerned for their records and advise them of any subsequent amendments.

D3.2 Progress in relation to the Programme and Reports thereon

D3.2.1 After having accepted the programme you shall satisfy yourself regularly as to the progress made against such programme, discuss this at all site meetings and record any action taken in item (viii) of the minutes as described in D8.4 hereof.

D3.2.2 If any delay in the progress of the work occurs, or the Contractor reports circumstances which indicates that delay is likely to occur, you must ascertain the cause and minute at the next meeting what steps are to be taken, and by whom, to rectify matters.

D3.2.3 If the delay is due to failure in the supply of necessary drawings or instructions to the Contractor, you must immediately rectify the matter. If you are unable to do so yourself, e.g. due to delay on the part of other Consultants, you must instruct them in writing to rectify the matter immediately and send copies of your instructions to the Departmental Representative, and subsequently inform them of the outcome of your instructions.

D3.2.4 If the delay is due to any other cause outside the control of the Contractor, such as changes in the requirements of this or the User Department, or to organised work stoppages by any workmen not due to any action on the part of the Contractor, you must remind the Contractor of the procedure which he should follow in terms of the relative clause of the Conditions of Contract relating to extension of the contract period and yourself proceed in terms of D1.4.2 hereof.

D3.2.5 If the progress of the works is behind schedule and you are satisfied that the delay is due to default by the Contractor, you must so inform him in writing, stating your reasons and also drawing his attention to the terms of the relative clause of the Conditions of Contract. You must further report the matter to Departmental Representative enclosing a copy of your letter to the Contractor. Copies must also be forwarded to the Departmental Representative.

D3.2.6 If you do not receive a satisfactory response from the Contractor to your notification in writing as described in D.3.2.5 hereof, you must warn the Contractor in writing, on a continuing basis as

long as this stage of affairs prevails, that you will be obliged to recommend that the Department take action in terms of the relative clause of the Conditions of Contract.

D3.2.7 In all cases where you are not satisfied with the progress of the works in relation to the programme, in addition to the other steps to be taken in terms of D3.2.1 to D3.2.6 hereof, you must minute the progress of the works at the monthly minutes of meetings.

D3.2.8 The monthly minutes of progress referred to in D3.2.7 hereof must be completed in such a manner as to enable the Department to take cognisance of the reasons for the unsatisfactory progress of the works. Delays caused by the Contractor himself and/or those beyond his control, as well as those caused by Nominated Sub-contractors or Specialist contractors and/or the Director-General or his Representatives/Agent, must be stated in the minutes. Mention should also be made of what steps you have taken to improve the progress or to rectify matters, as the case maybe, as well as the results of the steps taken by you.

If the unsatisfactory progress is solely or partially due to failure on the part of the Contractor and he fails to respond to your warnings, recommendations must be made in the minutes regarding the application of any one or more of the courses set out in the relevant clause of the Conditions of Contract.

D3.2.9 The Departmental Representative will advise you, what further steps you are required to take or alternatively what action the Department itself intends to take.

D3.3 **Claims for Extension of the Contract Period**

D3.3.1 All claims for extension of the contract period must be dealt with continuously during the contract (decisions must not be delayed until the end of the contract even though this is allowed in terms of the relevant Clause).

D3.3.2 Within 14 days after receiving a claim for extension of the contract period from the Contractor you as Principal Agent must investigate the claim and submit it with your complete motivation and recommendation to the Departmental Representative.

The recommendations must contain the following information in respect of every claim:

- (i) Number of claims
- (ii) Date of event.
- (iii) Period claimed.
- (iv) Date on which claim was made.
- (v) Reasons given by Contractor.
- (vi) Recommendation in respect of extension, condonation and application of penalties.

You must simultaneously send a copy of the claim and recommendation to the Departmental Representative for information.

D3.3.3 The Departmental Representative must examine the recommendation within 14 days.

D3.3.4 The Departmental Representative will make a recommendation to his Director for a decision whereafter the Contractor will be informed in writing by Head Office. The letter from the Department to the Contractor will explain the extension granted or refused and give reasons in the case of refusal.

D3.4 **Notice of Delays and claims for Compensation and Extension of the Contract Period**

D3.4.1 Such notices and claims must be brought to the attention of Head Office immediately with notification of the steps being taken to avoid or end the delay. The claims for extension can be dealt with as set out in D3.3.

D3.4.2 The claims for compensation for delays must be submitted with the Principal Agent's comments to the Departmental Representative.

D3.4.3 In the case of a claim for compensation on purely engineering services such claim must be submitted to the Departmental Representative.

D4. ISSUE OF DRAWINGS

D4.1 By the Regional Representative

The Departmental Representative will furnish the Contractor with three copies of your own and all Consultants' drawings and other documentation at the handing-over-of-site meeting.

D4.2 By the Consulting Engineer

Thereafter you must provide the contractor with three copies of all supplementary or Variation Order drawing and documents which may be required to be issued during the progress of the contract. You must keep a complete record of all such issues. obtain the Contractor's signature for receipt thereof and furnish copies of these records together with polyester copies of all supplementary and Variation Order drawings to the Departmental Representative.

All drawings must be issued under cover of a site instruction and an update drawing schedule must be maintained on site at all times indicating date of issue and drawing number.

D5. SUPERVISION

D5.1 Responsibility for Supervision

You are required to exercise full supervision to ensure that the work as executed conforms to the provisions of the contract. Supervision of the various disciplines is the responsibility of the relevant Consultants or Departmental officials, who will advise you of all instructions which were given in connection with their work, but you must ensure that the co-ordinated installation drawings are completed and that the Contractor and Sub-contractors, nominated or direct, comply with the construction programme.

D5 2 Site Inspections

Throughout the progress of the contract you are required to make such periodic visits to the work or related to the works as are necessary to determine that the work is proceeding in accordance with the requirements of the contract and implied intent of the design and documentation.

D5 3 Quality Control

D5.3.1 You are responsible for exercising quality control of workmanship, materials, components and finishes.

D5.3.2 Concrete test cubes are to be made and cured by the Contractor under supervision of the Structural Consultants or the Departmental Representative.

D5.3.2 Reference must be made to the relevant Specifications and any items not covered should be referred to the Departmental Representative.

D5.4 Clerk of Works, Engineering Assistant, or Resident Engineer

Where in the opinion of the Department the size or complexity of the project requires that you be assisted in the performance of quality control, the Department, either at your request or on its own initiative, may appoint and pay for the services of a clerk of Works or Resident Engineer for day to day supervision. Such a person could alternatively be a member of your own firm, or of the Department's Staff, or be recruited from the private sector. Any request which you may

make for such assistance must be fully motivated and submitted in writing to the Departmental Representative together with the necessary application form PRO 033/1-3 to be obtained from the Departmental Representative.

D5.5 Duties Generally

You are required to perform all the duties normal to the practice of your profession and to give advice on any matter connected with the works which the Department may require.

D5.6 Nominated Sub-contractors

D5.6.1 In the normal course, Consulting Engineers of the various disciplines will be responsible for the day to day supervision and quality control of engineering matters on building works, which are executed by Nominated Sub-contractors, but you as Principal Agent will be responsible for issuing and recording all instructions to the Main Contractor.

D5.6.2 Where Consulting Engineers have not been appointed for an engineering service, then the Departmental Representative will be responsible for quality control of such service and you shall seek the assistance and advice of the relevant Inspectorate staff in giving the necessary instructions on site.

D5.6.3 In the latter case, if you consider the circumstances to be such that it is essential that Consulting Engineers or other Specialists be appointed, you must submit full and detailed written motivation for such appointments to Departmental Representative.

D5.7 Comprehensive Services

If engineering works are carried out on building works without separate tenders having been called for by the Department, the responsibilities will be the same as described for Nominated Sub-contractors.

D5.8 Separate Contracts

In cases where the Department has entered directly into separate contracts for engineering services, the relevant Consultants or the Departmental Representative, as the case may be, will be responsible for all supervision of these services, but they will work in close consultation with you. You will be responsible for co-ordination of separate contracts in so far as they form an integral part of the building project. Refer to D6.1.3 hereof.

D5.9 Co-ordination of all Engineering Services

Whatever form of contract is entered into for such services you must ensure that the Contractor complies with the requirements of your co-ordination drawings in all respects, such as maximum sizes and exact positions of services and fittings.

D6. DECISIONS AND INSTRUCTIONS ON SITE

D6.1 Instructions to Contractors

D6.1.1 Instructions on site may only be given to the Contractor, his foreman or other person specifically nominated by the Contractor for the purpose, by you as Principal Agent or by such other person as you nominate to act on your behalf.

D6.1.2 In all cases where you are co-ordinating engineering services, either comprehensive or where Nominated Sub-contractors are involved, the relevant consulting or Departmental Engineer, or in the latter case Departmental Inspectorate Staff, are authorised to draw the attention of the Sub-contractor to matters affecting the quality of the work. However, instructions must be followed up in writing to the Contractor.

D6.1.3 The same conditions apply in the case of direct contracts between the Department and a separate contractor, provided that you are the Principal Agent in respect of that separate contract and are accordingly co-ordinating the work. This will generally be the case where electrical and mechanical services, as well as other specialist service such as acoustical treatment are involved. In all cases, only to the extent that such works form an integral part of the building project, and which, therefore, you are not involved in co-ordination, supervision or administration. This will be determined by the Department on each individual service.

D6.1.4 If the Contractor or a Sub-contractor should carry out any work without prior authorisation, the said Contractor or Sub-contractor will be responsible for restitution of or making good such work at his own expense. He will also be responsible for the reimbursement of any fruitless expenditure incurred by any other contractor or any Professional Consultant as a consequence of either the original unauthorised work or of its restitution. However, in order to avoid delays and possible litigation over such matters, you are required at all times to maintain a close watch on the execution of the contract to ensure that no departure is made from the work as designed and documented without prior authorisation, by the issue of any appropriate Variation Order in accordance with the procedure described in Chapter E hereof.

D6.2 **Decisions on Matters arising on Site**

D6.2.1 You will deal with all minor matters arising on the site. In the case of engineering services this must be done in co-operation with the relevant Consulting Engineers or Departmental Representative.

D6.2.2 if any major points arise on site which require decisions in principle, you must apply in writing to Departmental Representative.

D6.2.3 All changes affecting the contract must be made by Variation Order in accordance with the procedure laid down in the following chapter E: Variations.

D6.3 **Requests made by User Departments**

Requests from representatives of a User Department for changes must be made officially in writing by the Head Office of that Department to the Director-General. Requests of a minor nature on site which do not involve additional expenditure may however be dealt with by you in terms of paragraph E 6.

D7 **FUNCTIONS CONCERNING THE DEPARTMENTAL REPRESENTATIVE**

D7.1 **The Departmental Representative as Client**

D7.1.1 The Departmental Representative is the authorised representative of the Director-General and as such holds all funds for building contracts and will advise you on any financial negotiations which may become necessary.

D7.1.2 He will give official decisions on the quality of workmanship and materials acceptable to the Department.

D7.1.3 The Departmental Representative must be invited to attend all formal site meetings and may attend personally or appoint a member of his staff to do so.

D7.2 **Payment of Certificates**

The Departmental Representative will arrange for the payment of all certificates prepared by you for issue to the Contractor based on information provided by the Private Quantity Surveyor, the relevant Consultant or Departmental Engineers, or, if they are involved, members of the Regional Inspectorate Staff. The original standard form PW 156: Progress Payment Certificate of the Department is to be used for certifying payments. You will be notified by the Department

of any extension of time which has been authorised. You must deduct the penalties laid down under the relevant clause of the Conditions of Contract from all certificates issued subsequent to the expiry of the contract period or authorised extension thereof.

D7.3 Budget Reporting

D7.3.1 The Department's financial year runs from 1 April to 31 March of the following year.

D7.3.2 As soon as possible after commencement of the contract, the Private Quantity Surveyor, in consultation with you and the Contractor and based on the latter's construction progress chart, will prepare a report of the estimated annual expenditure expected during the currency of the contract, including a monthly cash flow chart and submit this to the Departmental Representative. Thereafter, at regular intervals of not exceeding three months, both the annual expenditure and the final cost of the contract is to be reported upon. For this purpose you are required to keep a record of the estimated costs of omission and to keep a record of the estimated costs of omission and additions by Variation Orders, detail of which is to be included in your report. Reports are to be presented in a form as required by the Departmental Representative.

D7.3.3 The statement of the estimated annual expenditure will also include the work of all nominated sub-contractors or direct contracts for engineering and specialist services. The relevant Consulting Engineers or Specialists will prepare estimates of expenditure for their respective services, but where no Consultant has been appointed and the design and supervision is being undertaken Departmentally, the Departmental Representative will be responsible for the provision of the required information.

D7.3.4 As Principal Agent you will submit this report of estimated annual expenditure to the Departmental Representative.

D7.3.5 The actual progress made by contractors and sub-contractors will be monitored monthly and you will update the estimated expenditure for the remaining portion of the work accordingly. The amended report of estimated expenditure will be passed to the Departmental Representative as before.

D7.3.6 The department's estimated annual expenditure is reviewed in depth twice a year in July and October; these procedures are known as the First Revised and Second Revised Estimates of Expenditure. At these junctures you, in collaboration with the other consultants are required to give special attention to the estimated expenditure for the service during the remainder of the current and any subsequent financial years.

D7.4 Distribution of Variation Orders

You must supply copies of all Variation Orders, including drawings, as issued to the Contractor, to the Departmental Representative, the private Quantity Surveyor and the Regional Representative for record purposes. Where specialist contracts are involved you must also supply copies to the relevant Consulting and Departmental Engineers.

D7.5 Visits of Departmental Officials to the Site

D7.5.1 The Departmental Representative or his appointee shall have the right to visit the site at all reasonable times.

D7.5.2 Similarly an appointee of the Director-General shall have access to the site at all reasonable times.

D8. SITE MEETINGS

D8 1 Agreement of Site meetings

The person acting as Principal Agent must be a principal or partner in your firm. He will convene Site Meetings and act as Chairman. He must cause proper minutes to be kept, of which five copies must be furnished to the Departmental Representative, and one copy each to all other firms or persons concerned.

Technical Meetings in addition to Site Meetings are to be held at the discretion of the Principal Agent.

D8.2 Attendance at Site Meetings

Those represented at Site Meetings besides the Principal Agent, shall be other professional Consultants, the Contractor, Sub-contractors and separate Specialist Contractors, and the Department's Regional and Head Offices as they may decide. together with any others concerned with the work at the discretion of the Chair or the Department. Due notice must be given to all who will attend.

D8.3 Frequency of Meetings

Initially Site Meetings shall be held as required, but at intervals of not more than 14 days. If the contract proceeds satisfactorily the period may be increased at your discretion, but an official Site Meeting must be held at least once a month. Site Minutes must be distributed within seven days of the meeting.

D8.4 Form of Meetings

The following is a list of the main items which are required to form the agenda of and be recorded in the Minutes of al Site Meetings:-

- (i) Official title of the service, and WCS number.
- (ii) Departmental Head Office and erection file number, Regional Office file number and service number in the top right hand corner.
- (iii) Heading giving the date, time and number of the Meeting.
- (iv) Below the heading, the contract starting date, contract period and contract amount.
- (v) List of persons present and whom they represent, with apologies for absence.
- (vii) Approval of minutes of the previous meeting.
- (viii) Matters arising from the minutes of the previous meeting.
- (viii) Progress of the work in comparison with the construction and financial program stating percentage completed and whether progress is satisfactory or not.
- (ix) Consulting Engineer's progress reports, where relevant.
- (x) A statement as to whether the foundation remeasurement drawings have been completed and submitted to the Quantity Surveyor or other relevant party and whether the final value has been agreed.
- (xi) Delays and factors which are causing them, stating steps which are being taken to rectify the position. An escalation of cost by means of the formula is involved, the early establishment of the cost of delays is essential.
- (xii) Time lost through inclement weather.

- (xiii) A list of unsatisfactory work to be rectified by the Contractor.
- (xiv) Information, drawings of Variation Orders required by the Contractor.
- (xv) Information required by any other parties.
- (xvi) Drawings issued since the previous meeting.
- (xvii) Site instructions issued since the previous meeting.
- (xviii) A full description of all Variation Orders issued since the last meeting together with the numbers of all previous Variation orders issued.
- (xix) Discussions which have taken place since the previous meeting, recording any decisions and by whom they were taken.
- (xx) A record must be kept of any work already completed, wholly or partially, which may be affected by intended or proposed omissions or alterations.
- (xxi) General.
- (xxii) Date and time of the next meeting
- (xxiii) Particulars of how copies of the minutes of the meeting are distributed.
- (xxiv) Signature of the Chairman and date.

D8.5 Additional items for inclusion in the Minutes

D8.5.1 Special Equipment

Where the project includes special equipment an additional item must be placed on the agenda for site meetings, to ensure that at the appropriate stage of the contract tenders are called for the equipment.

D8.5.2 Responsibility for Supervision

Responsibility for supervision of the service by the relevant parties must be clear and details given, i.e. day to day supervision, clerk of works, nominal supervision, etc. The names of the persons involved for a specific service must be mentioned.

D8.6 Procedure for the preparation of Minutes

The following procedures must be strictly observed in keeping Site Minutes:-

D8.6.1 Minutes are to be kept in general accordance with the items listed in D8.4 hereof, and the same sequence must be maintained.

D8.6.2 Every clause, with its relevant sub-heading, must be included in all minutes. If an item has already been dealt with, this must be stated giving the date of the minutes when the action was recorded. Where matters have not been fully dealt with, the relevant clause must contain sufficient information to obviate the necessity of referring back to previous minutes.

D8.6.3 Where any item in the minutes calls for further action to be taken e.g. queries to be dealt with, information to be furnished or work to be executed, the name of the person who is to deal with the matter must be recorded alongside the item concerned, in an action column in the right hand margin of the minutes.

D8.6.4 The distribution of the minutes should be done within seven days of the Site meeting.

D8.7 Information required to maintain progress

At each Site Meeting the Chairman must ascertain from the Contractor whether he requires any drawings, information of decisions to ensure the maintenance of progress of the contract and to obviate delay. The Contractor's reply and, where appropriate, the names of persons who are to take the requisite action must be recorded in the minutes.

D8.8 Recording of Variation Orders

Variation Orders required to be issued during construction must be notified at Site Meetings and recorded in the minutes, stating whether-

- (i) they are of a minor nature, for which no drawings are required, and will be covered by a written Variation Order issued directly by you as Principal Agent, or
- (ii) a Variation Order drawing is required, in which case you must prepare a preliminary drawing for estimate and approval in accordance with procedures described in the following Chapter E, and
- (iii) a large Variation Order including engineering services is involved, whether as a comprehensive service or where sub-contractors are nominated, in which cases the estimates of all professional disciplines concerned must be submitted together with all relevant drawings and documents.

D9. FOUNDATION REMEASUREMENT DRAWINGS

D9.1 Preparation of drawings

You are responsible for the measurement of all foundations as constructed on site and for the preparation of accurate drawings in plan and detail section agreed to and signed by the Contractor, for the purpose of re-measurement.

D9.2 Submission of drawings

You are required to submit the necessary copies to the Quantity Surveyor where applicable for the purpose of re-measurement and to provide the Departmental Representative with a set of polyester transparent prints.

D10. APPROPRIATION (AS-BUILT) DRAWINGS

D10.1 Use of Variation Order drawings

Provided that you have complied with the requirements in paragraph E10.3 of the following Chapter, Variations, to furnish the Department with polyester transparent copies of all Variation order drawings for addition to the master set, the latter will be accepted as the appropriation drawings.

D10.2 Drawings required

If you have failed to comply with paragraph D10.1 you are required, at the completion of the contract, to furnish the Department's Head Office with a set of appropriation drawings in the form of polyester transparent prints, brought up to date to show the work as built. All these drawings will be denoted V.O. as previously described.

D10.3 Drawings of underground services

You shall ensure that accurately dimensional drawings of all underground services are prepared. These dimensions shall relate to a permanent fixed point to enable these services to be located at any future date.

E VARIATIONS

E1. NEED FOR VARIATIONS

E1.1 Good documentation avoids variations

You are most earnestly requested to ensure that your working drawings are fully complete in every detail, thereby avoiding the need for an excessive number of unnecessary Variation Orders.

E1.2 Excessive number of variations

If it is found necessary to issue an excessive number of Variation Orders despite the fact that no major variations are asked for by the Department, it will quite obviously be an indication that your working drawings were not adequately documented.

E.1.3 Non-issuing of Variation Orders while the need exists

Any attempt to cover up the lack of proper details on working drawings by persuading the contractor to carry out additional work without issuing proper Variation Orders can cause serious contractual problems and delay claims and will be viewed in a most serious light.

E2 TIMEOUS ISSUE OF VARIATIONS

Timeous issue of Variation Orders will avoid delay claims and it is therefore of great importance that you issue Variation Orders as quickly as possible, as they arise.

The introduction of variations which are late in relation to the critical path of the main contractor's programme and especially towards the end of the building contract may cause serious delays and justifiable claims for delays by the contractor. Obviously the late introduction of variations, particularly extras, will prevent the main Contractor from carrying out extra work concurrently with other work already included in the contract.

You are therefore urged to issue all necessary Variation Orders timeously.

E3. GENERAL PROCEDURE FOR VARIATIONS

E3.1 Responsibility for issuing Variation Orders

As Principal Agent, you are responsible for the issue of all Variation Orders in respect of the building and specialist contracts or subcontractors.

3.2 Method of issuing Variation Orders

E3.2.1 All Variation Orders are to be issued on the standard forms PW 778/1 and 778/2 obtainable from the Departmental Representative. For procedure see E12.1 hereof.

E3.2.2 Many variations also require the amendment of drawings and /or issue of supplementary drawings. For procedure see E 10 and E 12 hereof.

E4. OCCURRENCE OF VARIATIONS

Variations fall into five main categories and occur only when changes are made after completion of the Bills of Quantities:

(a) changes required before the contract is let

- (b) those of a minor nature, mainly arising from the documentation;
- (c) those of a major nature, requiring Departmental authorisation;
- (d) those to be carried out on the instructions of the Department; and
- (e) those arising from alterations to User Department requirements.

E5. CHANGES TO DRAWINGS BEFORE THE CONTRACT IS LET

E5.1 Alternative methods

After completion of the working drawings, during or after preparation of bills of Quantities, but before a contract has been let, you will be instructed whether -

E5.1.1 to attend the drawings; or

E5.1.2 to prepare a V.O. drawing or drawings in the manner described in E 10 hereof and return it/them to the Departmental Representative.

E5 2 Amendment of drawings

Where you are instructed to amend drawings, the date and particulars of amendments are to be annotated as for V.O. drawings, as described in A 7.4.2 hereof, in the right hand panel above the title block, but in this case starting from the bottom.

E6. VARIATIONS DURING CONTRACT OF A MINOR NATURE

E6.1 Authority to issue Variation Orders

As Principal Agent you may, without prior Departmental authorisation, of your own accord or at the instigation of other Consultants, issue Variation Orders of a minor nature, mainly those arising from the documentation in any of the circumstances detailed below.

E6.2 Causes of such Variation Orders

E6.2.1 Variations of a minor nature can result from -
unforeseen site conditions, except those where substantial additional cost is involved, e.g. for special foundations, approval must be obtained from the Department;

E6.2.2 co-ordination of documentation; or

E6.2.3 a need for substitution of materials, components or finishes. either because the items specified are no longer available, or because through interim experience they have been found unsatisfactory or less suitable for the specific application

E6.2.4 instructions required to avoid delay of the works; or

E6.2.5 instructions required to ensure the safety of the works.

E6.3 Effecting minor changes

In order to effect minor changes, provided that –

E6.3 1 the functioning of the building is thereby improved; and

E6.3.2 any additional cost can be covered by savings elsewhere or by the balance available in the relative contingency sum.

E7. VARIATIONS REQUIRING NO DRAWINGS

E7.1 Use of standard form

Where no drawings are required, issue the V.O. on the standard form as described in E 12 hereof.

E7.2 Approval for major variations

If such a V.O. is of a major nature, first obtain approval in principle as described in E 8 hereof.

E8. PROCEDURE FOR OBTAINING APPROVAL IN PRINCIPLE FOR MAJOR VARIATIONS

E8.1 Obtaining prior approval

In case you require to issue Variation orders which -

E8.1.1 fall into any of the foregoing categories but insufficient funds are available; and/or

E8.1.2 involve substantial re-planning; major or basic changes to the design; additions to and/or major substitutions of materials, components or finishes; fruitless expenditure; legal implications or deviations from the conditions of conditions of contract; you must first obtain prior approval in principle from the Department.

E8.2 Particulars required for approval

For the purpose of obtaining such approval you must submit, through the Departmental Representative, full particulars of the proposed Variation Order including:-

E8.2.1 motivation;

E8.2.2 estimated cost;

E8.2.3 an assessment of any fruitless expenditure; and

E8.2.4 a financial report detailing the funds position of all contracts in order that the Department may give consideration to the overall financial position of the contract and any possible effect on the contract period.

E9. FINANCIAL CONTROL

E9.1 Strict expenditure control

Since the Department is required to plan and execute its building programme within fixed budget amounts, strict control over expenditure on variations has to be exercised so that -

E9.1.1 costs limits of the project as stipulated by the Department and/or the Treasury Committee for Building norms and Cost Limits are not exceeded;

E9.1.2 applications for uplifts in cost provision are kept to a minimum;

E9.1.3 fruitless expenditure and claims from contractors are avoided;

E9.1.4 the department is never placed in the position of having to authorise **ex post facto** applications for additional funds for the completion of the service.

E9.2 **Consideration of financial implications**

To this end, estimates of the cost of proposed Variation Orders must be obtained from the appropriate Consultant(s) and the financial implications considered, before the work involved in the Variation Order is put in hand.

E10. IMPLEMENTATION OF MAJOR VARIATIONS REQUIRING THAT DRAWINGS BE PREPARED

E10 1 **Procedures to be followed**

When variations as in E 8 hereof are proposed by you and the approval of the Department has been obtained, follow one of the following procedures;

E10 1 1 **Before the contract is let**

- (a) As alterations cannot be shown on contract drawings, make polyester negative prints from which contract drawings are taken.
- (b) Prepare the V.O. on the original drawings (s) in accordance with the procedure in A7.4.3 hereof.

E10 1.2 **After the contract is let;-**

All variations on drawings issued for contract purposes are to be carried out on the **original drawings** in your possession. The copies which you must furnish in terms of D 10.1 hereof to the Departmental Representative will be retained by him to complete the master set.

E10 2 **Estimate of cost**

E10.2.1 In all cases first prepare draft drawings, in consultation with all other parties concerned as may be necessary, and pass to the Quantity Surveyor, where applicable, for estimate of cost. You must ensure that any separate drawings which have to be prepared have first been approved by the Departmental director concerned.

E10.2.2 If the form of contract is such that a comprehensive service or a service which provides for nominated sub-contractors is involved, obtain estimates of cost from the Private Consultants or Departmental Sub Directorates involved for their part of the work.

E10.2.3 Submit the draft drawings and estimates to Departmental Representative for formal approval.

E10.3 **Preparation of Variation Order drawings**

If the variation is approved, proceed to prepare the Variation Order drawings as prescribed in A7.4.3 hereof, on the original drawings in your possession plus any supplementary negatives which may be necessary.

E10 4 **Electrical and Mechanical Work**

In cases where Electrical and/or Mechanical work is carried out under separate contracts, furnish full particulars of the Variation to the Engineers responsible.

E11. VARIATIONS ARISING FROM USER DEPARTMENT REQUIREMENTS

E11.1 **Processing of applications for variations**

As laid down in D6.3 hereof, applications for changes in the accommodation or other provisions of the service are not to be accepted from individual officers of the User Department, except requests of a minor nature not involving additional expenditure, which can be dealt within terms of E6. hereof. In all other cases applications by User Departments for variations must be made by their Head Offices in writing to the Director-General and may under no circumstances be processed until prior written approval in principle in terms of E8. hereof has been given by this Department.

Upon receipt of approval in principle, prepare the Variation Order in accordance with the same procedure as in A7.4.3 hereof for formal authorisation.

E12. ISSUE OF VARIATION ORDERS

E12.1 Variation Order Forms

All Variation Orders are to be issued on the Standard Variation Order forms obtainable from the Departmental Representative. They are to be numbered in order of date and, where drawings are involved, are to be written out to correspond with the wording of the annotation on the V.O. drawing, as follows:-

- V.O. - number and date
- Omit - describing each item of work involved
- Add - describing each item of work involved
- Note - No costs are to be given on the original V.O. Issued to the Contractor.

E12.2 Distribution of completed Variation Order forms

Copies of the Variation Orders issued to the Contractors) must be submitted to the Departmental Representative and where applicable to the Co-ordinating Architect, and the Private Quantity Surveyor. In the case of specialist contracts, copies must also be submitted to the relevant Sub Directorates and Consultants.

E12.3 Additional information required with Variation Order Forms

Variation Orders submitted must be accompanied by a separate statement listing the following:

- (a) All previous Variation Orders issued with estimates and cumulative total omission and additions.
- (b) All new Variation Orders with estimated omissions and additions.
- (c) Confirmation that funds are available or that prior approval has been obtained in cases where additional funds are required.

E12.4 Forms and drawings to be issued together

Where drawings form part of the variation, they are to be issued . together and concurrently with the Variation form. Prints of the drawings are also to be issued with each of the copies described in E12.2 hereof; except that no drawings are required by the Departmental Representative when a Private Quantity Surveyor has been appointed.

E13. LATE VARIATION ORDERS

You may not issue any Variation Orders after First Delivery unless specific approval therefore is first expressly obtained from the Departmental Representative.

E14. ISSUE OF QUARTERLY FINANCIAL REPORTS

You must submit to the Departmental Representative, with copies of a financial report reflecting the cost implications of all Variation Orders issued and the current total expenditure against the contingency sum(s) and any additional financial authorisation. Refers also to D7.3.

F HANDING OVER OF COMPLETED SERVICE

F1. HANDING OVER OF PROCEDURES

F1.1 Taking first delivery

On completion of the works you must arrange with the contractor and the Departmental Representative for a joint inspection of the works with their appointees. If you are satisfied that the works are complete you will advise the Contractor thereof in writing. This document is known as the First Delivery Certificate (PRM 041) from the date of which the applicable maintenance period commences. You are required to compile a detailed list of defects observed as requiring to be remedied and of work still to be completed. Copies of this list, stating the date of inspection and the names of those present, are to be issued to the Contractor for attention and to the Departmental Representative for record purposes.

F1.2 Patent defects not observed during inspection

Any omissions or defects, which were not observed during the inspection for First Delivery, still remain the responsibility of the Contractor. If discovered subsequently they must be brought to the attention of the Contractor, with instructions to rectify them in addition to the items on the original list.

F1.3 Latent defects

In addition, any latent defects, which become evident after First Delivery, whether specifically mentioned in the building contract or otherwise, remain the responsibility of the Contractor who is to be informed that they must be rectified before final delivery will be taken.

F1.4 Final Delivery

Final delivery shall be taken jointly by you and the Departmental Representative at the end of the maintenance period stipulated in the contract documents and subject to your instructions regarding rectification of defective work having been complied with. This procedure will follow a joint inspection by the parties concerned in First Delivery and a subsequent acceptance in writing of the completed premises addressed by the Departmental Representative to you as Principal Agent.

F1.5 Completion Certificate

On receipt of the written acceptance of the completed premises from the Departmental Representative, as described in Paragraph F1.4 hereof, you shall issue to the Contractor a Final Delivery Certificate (PRM 046), which will entitle him to apply for final payment of all amounts due to him in terms of the contract

F1 6 Contract Completion Report (PRM 043)

Immediately after taking first delivery the Principal Agent must complete this form in consultation with the Departmental Representative and send it to the Department for his attention. The form must reflect all approved extensions of the contract period and recommendations in respect of condonation.

Under "work performance of contractor" you must give your opinion on problems encountered programming of work, quality of work, contractor's capabilities, and whether he is recommended for future contracts.

The Departmental Representative will check the Contract Completion Report and submit it with his own recommendations to the Committee, which decides finally on the application of penalties and condonation.

The Committee's decision is then made known to the Contractor, Departmental Representative, Principal Agent and all departmental disciplines.

F1.7

Final Accounts

Final measurement and quantities for completed sections of the Contract must be agreed with the Contractor as soon as possible after completion of such sections of the work.

The final statement for the Contract must be in accordance with Form PRM 044. Final Statement which can be obtained from the Departmental Representative.

The final account must be certified in accordance with the Certificate of Compliance and Indemnity by Consultants (PRM 045) within three weeks after receiving the official decision regarding imposition of penalties. The Department will forward the final account to the Contractor for signature.

Where work has been done as day-work, the final account must be accompanied by an audited statement regarding the wages paid to the relevant employees as well as time sheets and invoices for all material used, certified by the Representative/Agent.

CONSULTING ENGINEER'S PROGRESS REPORT**DATE: (M/Y)**(N.B. TO BE FORWARDED ON LAST WORKING DAY OF EVERY MONTH)

The Director-General
 Department of Public Works
 Attention: Director: Major Projects
 (Project Manager's Name)
 Private Bag X 65
 PRETORIA
 0001

Consulting Engineer:

PROJECT NAME _____

WCS NO _____ REF NO _____

1. Brief report of activities during month

2. Date of discussions with Architects:

3. Architectural drawings for structural design:

a) 1:100 Scale architectural plans still outstanding: _____

b) The following 1:100 scale and other architectural details have been obtained on the dates given:

4. The structural design is being delayed for the following reason(s):
(If applicable)

5. Expected date of completion

6. Progress: (given as estimated percent completion of each stage)

(a)	Preliminary scheme	_____ %
(b)	Calculations for reinforced concrete	_____ %
(c)	Calculations for structural steelwork	_____ %
(d)	Foundation and floor layouts showing concrete profiles etc. (Without floor reinforcement)	_____ %
(e)	Layouts showing floor reinforcement	_____ %
(f)	Rod bending schedules and any further reinforcement details	_____ %
(g)	Details of structural steelwork	_____ %
(h)	Service as whole	_____ %

SIGNATURE _____ DATE _____

NOTE: Paragraphs 3,4,5 and 6 to be filled in only when instructions to proceed with working drawings have been issued.

DEPARTMENT OF PUBLIC WORKS**DESIGN STRESSES FOR REINFORCED CONCRETE INWORK UNDERTAKEN BY CONSULTING ENGINEERS**

1. The following maximum concrete stresses should be adopted in the design of reinforced concrete to Chapter 5 of the Standard Building Regulations (Act 33 of 1962). In the case where design of R.C. is to S.A.B.C. 0100, the respective 28 day cube strength f.c.u. for Classes E and F is 25 Mpa and 30 Mpa respectively.

CASE DESIGNATION OF STRESS	MEGA NEWTONS PER SQUARE METER	
	NOMINAL	MIX
	1:2:4	1:11/2:3
	25 Mpa	30 Mpa
	Classes D & E	Class F
1. Direct compression	6.25	8.00
2. Compression due to bending	8.50	10.50
3. Shear	0.75	0.90
4. Average bond	0.90	1.00
5. Local bond	1.35	1.50

2. The following maximum stress should be adopted for reinforcing steel in meganewtons per square metre when using chapter 5 of S.B.R. (Act 33 of 1962). When using S.A.B.S. 0100 the relevant characteristic strengths of reinforcement are as defined in that document.

CASE DESIGNATION OF STRESS IN REINFORCEMENT	MAXIMUM PERMISSIBLE STRESS IN REINFORCEMENT OF	
	MILD STEEL	HIGH TENSILE OR COLD WORKED STEEL
1. Tension in helical reinforcement in columns	93	125 or 1/3 the guaranteed yield –or proof stress whichever is less
2. Tension in shear reinforcement in beams	140	175
3. Tension in reinforcement other than designated in cases 1 and 2	140	Half the guaranteed yield – or proof stress but not more than 210
4. Compression in column reinforcement	125	Half the guaranteed yield stress but not more than 175
5. Compression in beam or slab reinforcement when the compressive resistance of the concrete is not taken into account	125	Half the guaranteed yield stress but not more than 175
6. Compression in beam or slab steel when the compressive resistance of the concrete is taken into account		The calculated compressive stress in the concrete surrounding the bars concerned multiplied by 15, provided such stress shall not exceed the value case 5

WCS		SUMMARY OF ACCOUNT	FILE NO:	
			CONTRACT NO:	
IN ACCOUNT WITH:				
FIRM CODE		DIVISION		
PAYEE	AND ASSOCIATE FIRMS			
ADDRESS				
POSTAL CODE				
VAT REG.NO.		DATE OF APPOINTMENT		<u>CONDITIONS</u>
				GOV NOTICE NR
				DATE
PROJECT				
TYPE OF APPOINTMENT (HOURLY/%)			STAGE 1/2/3/4/5	
BUILDING CLASSIFICATION			PAYMENT CERT. NO	
(a) TARIFF OF FEES (Annexure A4 - Part A)				
		Report	Other	
Time Basis Fee (Annexure A4- Part B)				R
Total Time Fee Previously Paid				R
Less: Report Fee now included in tariff				
				R
Total Time Fee to Date				
(b) DISBURSEMENTS				
Subsistence and Travelling (Annexure A5)		R		
Printing (Annexure A6)		R		
Typing and Duplicating (Annexure A7)		R		
Survey and Soil Testing (Annexure A8)		R		
Site Staff (Annexure A9)		R		
Other -Specify		R		
Total Disbursements this Claim		R		R
Total Disbursements Previously Paid		R		
Total Disbursements to Date		R		
AMOUNT OF THIS CLAIM				R
signed	_____ CONSULTING ENGINEER		DATE:	_____
NOTE	Fill in only the appropriate portions of Annexure A4 to A9 and attach to this claim.			

DEPARTMENT OF PUBLIC WORKS		STRUCTURAL
WCS <input style="width: 100px;" type="text"/>	FILE NO.:	<input style="width: 100px;" type="text"/>
TARIFF OF FEES: (% or Time Gov. Gaz. R1113)		
IIN ACCOUNT WITH: SE <input style="width: 150px;" type="text"/> PAYEE <input style="width: 300px;" type="text"/> ADDRESS <input style="width: 300px;" type="text"/>	INVOICE NUMBER <input style="width: 100px;" type="text"/> YOUR REF. <input style="width: 100px;" type="text"/> DATE <input style="width: 100px;" type="text"/>	
POSTAL CODE <input style="width: 100px;" type="text"/> VAT REG.NO <input style="width: 150px;" type="text"/>	CONTRACT NO. <input style="width: 100px;" type="text"/>	PAYMENT CERT NO. <input style="width: 100px;" type="text"/>
PROJECT <input style="width: 500px;" type="text"/>		
(a) FEES FOR DOCUMENTS		
DESIGN	R c	R c
PLUS	_____	_____
BILLS OF QUANTITIES	_____	_____
TOTAL PAYABLE NOW	_____	_____
LESS: PREVIOUS PAYMENTS (DOCUMENTS)	_____	_____
FEES PAYABLE NOW FOR DOCUMENTS (a)	_____	_____
(b) FEES FOR SUPERVISION		
DESIGN	R c	R c
PLUS	_____	_____
BILLS OF QUANTITIES	_____	_____
TOTAL PAYABLE NOW	_____	_____
LESS: PREVIOUS PAYMENTS (DOCUMENTS)	_____	_____
FEES PAYABLE NOW FOR DOCUMENTS (a)	_____	_____
(c) TIME BASED FEES THIS ACCOUNT		
Tariff x 1 x hours	1	R c
Tariff x 2 x hours (See addendum for detail)	2	R c
Tariff x 3 x hours	3	R c
TOTAL PAYABLE NOW	_____	_____
LESS: PREVIOUS PAYMENTS (DOCUMENTS)	_____	_____
ACCUMULATED TOTAL NOW (c)	_____	_____
TOTAL PROFESSIONAL FEES DUE (a) + (b) + (c)		
_____	_____	_____
(d) DISBURSEMENTS THIS ACCOUNT		
Typing, copying, etc	1	R c
Travelling (See addendum for detail and invoices)	2	R c
Subsistence	3	R c
Other charges	_____	_____
TOTAL PAYABLE NOW	_____	_____
LESS: PREVIOUS PAYMENTS (DOCUMENTS)	_____	_____
ACCUMULATED TOTAL NOW	_____	_____
PLUS: VAT @ 14% OF 100% OF		
PLUS: VAT @ 14% OF _____ OF	_____	_____
TOTAL VAT	_____	_____
AMOUNT DUE	_____	_____
TOTAL PAYMENTS TO DATE		
LESS: TOTAL PREVIOUS PAYMENTS	_____	_____
AMOUNT DUE	_____	_____
Account to be certified for payment by Departmental Project Manager/Officer		

WCS		DEPARTMENT OF PUBLIC WORKS	FILE NO:	
			CONTRACT NO:	

IN ACCOUNT WITH:

FIRM CODE		DIVISION		AND ASSOCIATE FIRMS
PAYEE				
ADDRES				
POSTAL CODE				

VAT REG.NO.		DATE OF APPOINTMENT		CONDITIONS	
				GOV NOTICE NR	
				DATE	

PROJECT	

TYPE OF APPOINTMENT (HOURLY/%)		STAGE 1/2/3/4/5	
BUILDING CLASSIFICATION		PAYMENT CERT. NO	

(a)	TARIFF OF FEES (Annexure A4 - Part A)			
		Report	Other	
	Time Basis Fee (Annexure A4- Part B)			R
	Total Time Fee Previously Paid			R
	Less: Report Fee now included in tariff			
	Total Time Fee to Date			R

(b)	DISBURSEMENTS			
	Subsistence and Travelling (Annexure A5)	R		
	Printing (Annexure A6)	R		
	Typing and Duplicating (Annexure A7)	R		
	Survey and Soil Testing (Annexure A8)	R		
	Site Staff (Annexure A9)	R		
	Other -Specify	R		
	Total Disbursements this Claim	R		R
	Total Disbursements Previously Paid	R		
	Total Disbursements to Date	R		
	AMOUNT OF THIS CLAIM			R

ACCOUNTANT

Certified correct and passed for payment please

For **CHIEF DIRECTOR: ACCOMODATION UNIT**

NOTE Fill in only the appropriate portions of Annexure A4 to A9 and attach to this claim.

PROFESSIONAL FEE ACCOUNT
(In terms of R1113 as amended)
(Refer to Annexure A of Letter of Appointment)

Attached to Claim No _____ Dated _____

PART A: Tariff of fees

Form of Contract: _____
(Separate Contract – Reg. 2 or Part of Building Contract – Reg. 3)

Value of Civil Work excluding contingencies (show latest estimate only)

1. Preliminary estimate _____	
2. Tender estimate _____	
3. Tender Price _____	
4. Revised completion estimate _____	
Approved Final Account _____	

Current Progress of Service

1. Report	} Percentage.....	%	
2. Tender Documents			
3. Working Drawings			
4. Construction			
- Payments to date excluding Contract Price Adjustment			R _____
- Contract Price Adjustment			R _____
- Total Payment to Date			R _____

Fee

	Primary	+ _____ % of	Secondary	=	Total
1. Civil	_____	_____ % of	_____	=	R _____
2. Reinforced conc	_____	+ _____ % of	_____	=	R _____
3. Structural Steel	_____	+ _____ % of	_____	=	R _____
4. Mechanical	_____	+ _____ % of	_____	=	R _____
5. Other	_____	+ _____ % of	_____	=	R _____
(Attach Details for Items 2 – 5)					
TOTAL FEE BASED ON CURRENT ESTIMATE					R _____
FEE CLAIMED _____ % of TOTAL FEE					R _____
LESS – Previous Payments iro tariff fees					R _____
TOTAL for PART A (carried to Annexure A3)					R _____

SUBSISTENCE AND TRAVELLING COSTS
(Excluding Site Staff)
(Refer to Letter of Appointment)

Attached to Claim No _____ Dated _____

Purpose of Journey: _____

Staff Member: _____ Salary: = R _____ p.a

TRIP DETAILS

Trip Approval Date: _____

Outward Journey				Return Journey			
Departure		Arrival		Departure		Arrival	
Time	Date	Time	Date	Time	Date	Time	Date

Subsistence and Travelling Time Charges

Subsistence Charges				Travelling Time Charges		
Time Away		Subsis Rate	Amount Claimed	Distance to Destination (min 100km):		
Days	Hours			Travelling Time Claimed	Travel Rate	Amount Claimed
	xxxx				50% x	
xxxx						

Motor Vehicle Charges

From	To	Distance				Vehicle Type	Capac cc	Rate	Amount Claimed
		Out	Ret	Site	Total				

Public Transport

Flight Out	No's Ret	Outward Journey		Return Journey		Cost of Ticket(s)
		From	To	From	To	

TOTAL for Part B (carried over to Annexure A3)

R _____

TYPING AND DUPLICATING COSTS
 (Refer to Annexure B of Letter of Appointment)

Attached to Claim No _____ Dated _____

1 Typing

Description of Document	Pages	Rate	Amount

2 Duplicating

Description of Document	1 Pages	2 Copies	3 Rate	1 x 2 x 3 Amount

3. Covers and Binding

Description of Document	Pages	Rate	Amount

Total typing and duplicating (carried to annexure A3) R _____

Note:
 Attach invoices for work done by an outside organisation

COSTS RELATED TO SURVEYING AND SOIL TESTING

Attached to Claim No _____ Dated _____

Note: Claim Subsistence and Travelling on Annexure A5

PART B: Soil Tests – amount approved: R _____ Date: _____

Name and Designation	Salary + Bonus	Rate	Hours Claimed	R	C
Disbursements (Attach Invoices)					

Total B1 R _____

B2 Laboratory Charges

Description of Test	TMH No	No of Tests	Approved Rate	R	C

Total B1 R _____

Total for Part A (carried to Annexure A3) R _____

Amount previously claimed R _____

Total amount claimed to date R _____

COST RELATED TO SITE STAFF

Attached to Claim No _____ Dated _____

Approval Date(s): _____

PART A: Part Time Supervision

Month	Name	Approved		Hours claimed	R	C
		Hours	Rate			

Total A R _____

PART B: Full Time Supervision

Month	Name	Approved Remuneration	Portion claimed	R	C

Total B R _____

PART C: Travelling Costs

Month	Name	Dist. Approv.	Dist. Claimed	Vehicle Capac	Tariff	R	C

Sub-Total R _____

Sub-Total + 10% TOTAL C R _____

Part D: Other (Details on Attached Statement) TOTAL D R _____

TOTAL for site staff (A or B + C + D carried to Annexure A3) R _____

**FEE CALCULATION WHEN CPA EXCEEDS 10% OF TENDER – REGULATION 2.2.3.5.2 OF GOVERNMENT
NOTICE R1113**

Tender Price		R
Preliminary and General		R
Value of reinforced concrete		R
Re-measured value of work		R
CPA		R
Preliminary and General		R
Value of reinforced concrete		R
Value of work for design fee purposes		R
<u>Basic fee</u>		
Tender Price	R	
Allow 10% for CPA (Reg.2.2.3.5.2)		R
Pro rata CPA on balance of work		R
Re-measured value of work		R
<u>Reinforced concrete portion</u>		
Tender	R	
Pro rata P & G	R	
Allow 10% for CPA (Reg.2.2.3.5.2)		R
Re-measured value of concrete	R	R
Pro rata P & G	R	
Pro rata CPA on balance of concrete		R
		R

Basic fee

Re-measured value of work	R
CPA	R
	R

Reinforced concrete portion

Re-measure value of concrete	R
Pro rata P & G	R
Pro rata CPA on re-measured value of concrete	R
	R

Calculation of fees

Design fee

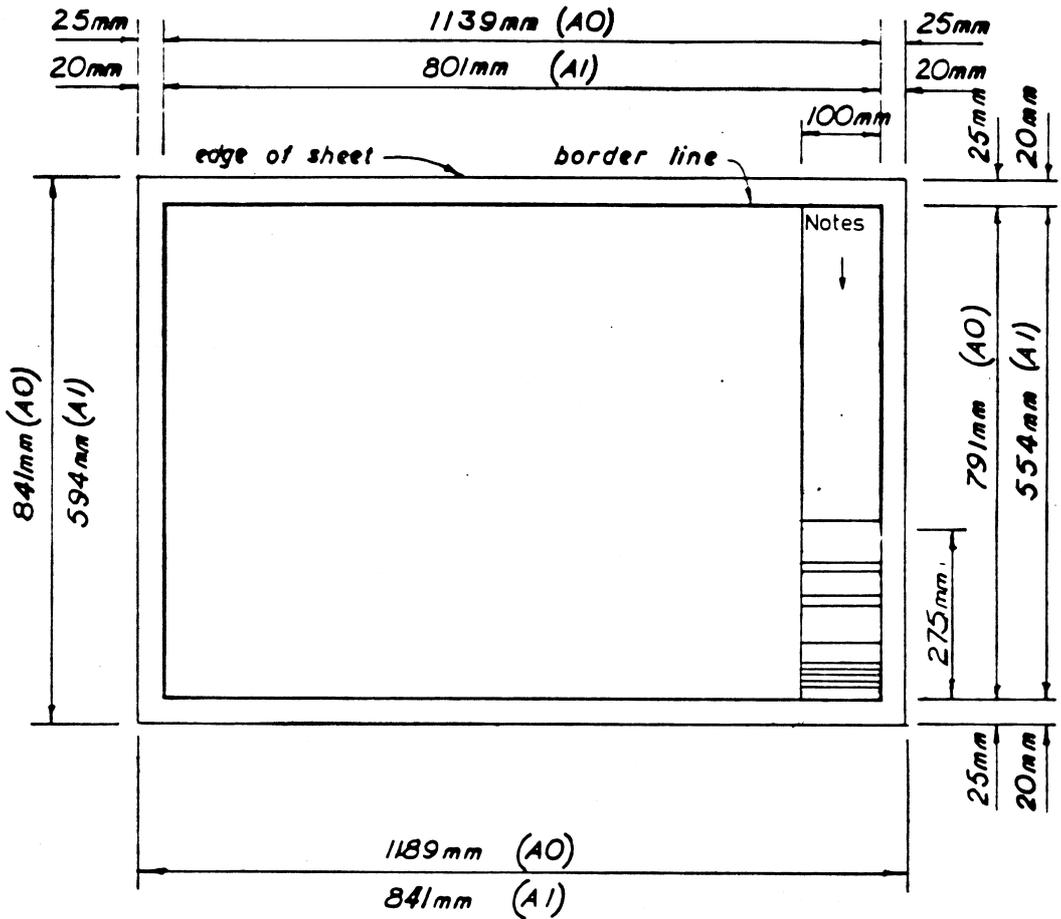
Basic fee	_____ % X(_____ + _____ x _____)	R
Reinforced concrete	_____ % X(_____ + _____ x _____)	R

Suoervision

Basic fee	_____ % X(_____ + _____ x _____)	R
Reinforced concrete	_____ % X(_____ + _____ x _____)	R
		R

The same principles apply for the fee for mechanical and electrical work and to the additional fee for structural steelwork. Similar principles apply to regulation 3.2.1.1.4.

STANDARD DRAWING SHEET SIZES.



A0: 841 x 1189
A1: 594 x 841

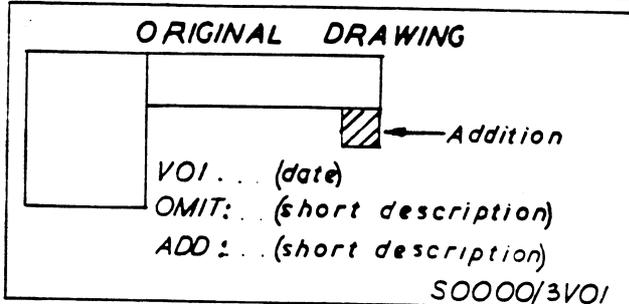
VARIATION ORDERS

ANNEXURE A 12

NOTE: 1. No erasures to be made on original drawings.
2. See para. 11 of the specification for Microfilming of Engineering Drawings regarding density and contrast of lines.

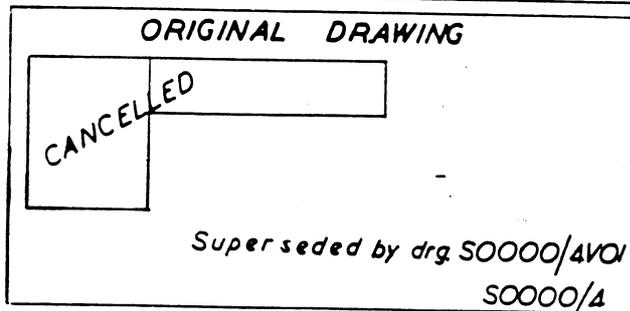
CASE-A

Where the original drawing is re-used for VO purposes.
Subsequent VO's to this drawing to be denoted by changing suffix VO1 of the drawing number to VO2, VO3, etc..



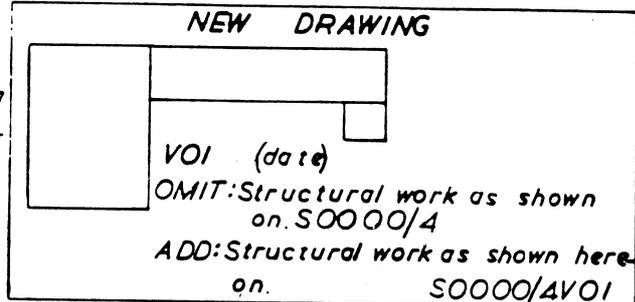
CASE-B

Where an entirely new drawing is prepared on which all information, including portion remaining unchanged, has been indicated.



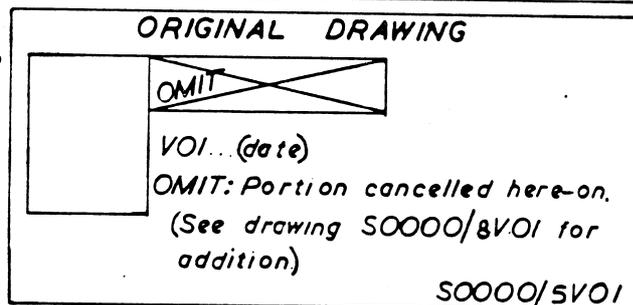
NOTE:

Only drawing S0000/4VO1 to be issued.
Subsequent VO's to this drawing to be denoted by changing suffix VO1 of the drawing number to VO2, VO3 etc..



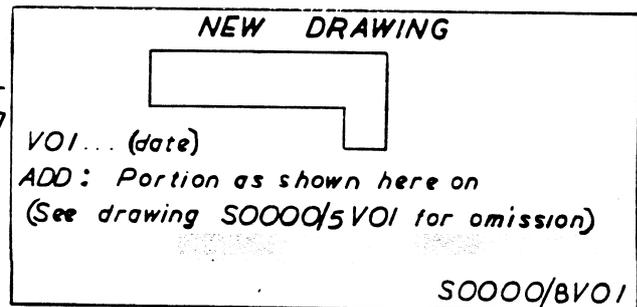
CASE-C

Where a new drawing has been prepared on which only the amended portion has been indicated.



NOTE

Both drawings S0000/5VO1 and /8VO1 to be issued.
Subsequent VO's to these drawings to be denoted by changing suffix VO1 of the drawing numbers to VO2, VO3, etc..



ANNEXURE A 13

EXAMPLE OF INSCRIPTIONS ON
CALCULATION FILE COVERS

PROJECT MANAGER:
DIRECTOR: MAJOR PROJECTS
DEPARTMENT OF PUBLIC WORKS

CALCULATIONS

PROJECT NAME

AT

TOWN/CITY

A.N. OTHER & PARTNERS

CONSULTING ENGINEERS

P.O. BOX 123

PRETORIA

DRAWING NO S0000/