VOLUME 5 CONTRACT DOCUMENT FOR SPECIALIST ACTIVITIES

SECTION 3 GROUND INVESTIGATION

PART 1: STANDARD

SD 13/97 AMENDMENT NO. 1

DOCUMENTATION REQUIREMENTS FOR GROUND INVESTIGATION CONTRACTS

SUMMARY

This Standard sets out the documentation to be used for Ground Investigation Contracts on trunk road schemes, including motorway schemes.

INSTRUCTIONS FOR USE

1. Insert replacement pages listed on the Amendment Sheet. (Amendment No. 1 - May 2005)

2. Remove the corresponding existing pages, which are superseded by this amendment and archive as appropriate.

3. Enter details of Amendment No. 1 - May 2005 on the Registration of Amendments Sheet, sign and date to confirm that the amendment has been incorporated.

4. Please archive this sheet as appropriate.

Note: A quarterly index with a full set of Volume Contents Pages is available separately from The Stationery Office Ltd.

Amendment No. 1 to SD 13/97 - May 2005

Instruction Sheet

Section	Revision
Front Sheet	Replace with new Front Sheet
Chapter 5	Replace pages 5/1 - 5/2 with new pages 5/1 - 5/2
Section 3	Replace pages D/11 to D/12 with new pages D/11 - D/12

MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS SD 13/97
Amendment No. 1
dated May 2005

THE HIGHWAYS AGENCY

SCOTTISH EXECUTIVE

WELSH ASSEMBLY GOVERNMENT
LLYWODRAETH CYNULLIAD CYMRU

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

THE DEPARTMENT FOR REGIONAL DEVELOPMENT
NORTHERN IRELAND

DRD
Department for Regional Development
www.drdni.gov.uk

Document Requirement for Ground Investigation Contracts

Summary: This Standard sets out the documentation to be used for Ground Investigation Contracts on trunk road schemes, including motorway schemes.

REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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SD 13/97

DOCUMENTATION REQUIREMENTS FOR GROUND INVESTIGATION CONTRACTS

Contents

1. INTRODUCTION

General

1.1 This Standard sets out the documentation required for trunk road and motorway Ground Investigation (GI) contracts and introduces the revised Specification and Method of Measurement (MoM) for Ground Investigation for Highway Works (MCHW5.3).

1.2 The Specification and MoM for Ground Investigation have been drawn up so that they may now readily be used in relation to ground investigation work associated with maintenance and new works contracts, whether these be measure and value contracts or contracts procured by other means (eg Design & Build or Design, Build, Finance & Operate contracts).

1.3 Advice on obtaining data on a road scheme and on preparing for a ground investigation contract is provided in Advice Note SA9/97.

1.4 This Standard and Advice Note SA9/97 supersede the following:

(i) HD13/87 "Documentation Requirements for Ground Investigation Contracts";

(ii) HA34/87 "Ground Investigation Procedure".

Scope

1.5 This Standard sets out the documentation to be used on trunk road and motorway ground investigation contracts.

Applicability

1.6 This Standard is applicable to all ground investigation contracts which are to be carried out for the Overseeing Organisations, both directly and by others acting on their behalf.

1.7 For ground investigation contracts to be carried out by other parties for their own purposes, alternative Conditions of Contract and forms of tender and agreement (where applicable) may be opted for in conjunction with the package comprising the Specification, Method of Measurement and Bill of Quantities, as listed in Chapter 2 overleaf, provided that the relevant amendments are listed in Schedule 4 of the Specification to ensure compatibility between documents.

Implementation

1.8 This Standard should be used forthwith for all schemes currently being prepared, provided that, in the opinion of the Overseeing Organisation, this would not result in significant additional expense or delay. Design Organisations shall confirm its application to particular schemes with the Overseeing Organisation.

2. DOCUMENTATION FOR GROUND INVESTIGATION CONTRACTS

2.1 There are 5 main elements to the documentation associated with GI contracts:

(a) Instructions for Tendering.

(b) Forms of Tender and Agreement.

(c) Conditions of Contract.

(d) Specification (including Method of Measurement)

(e) Bill of Quantities.

2.2 Instructions for Tendering, Forms of Tender and Agreement and Conditions of Contract (CoC) to be used in the context of paragraph 1.6 are those found in the Model Contract Document (MCD) for Ground Investigation Contracts (MCHW5.3) published by the Overseeing Organisations.

2.3 Instructions for Tendering do not form part of the Contract. They should not be bound into the tender document but should be issued to tenderers separately with the invitation to tender.

2.4 The Form of Agreement shall be omitted from contracts to be let directly by Overseeing Organisations. For Scottish contracts generally, an exchange of letters of "offer" and "acceptance" is sufficient to execute a contract between the parties.

2.5 In the context of paragraph 1.6, the Conditions of Contract used shall be the ICE Conditions of Contract for Ground Investigation (First Edition) issued in October 1983 jointly by the Institution of Civil Engineers (ICE), the Association of Consulting Engineers and the Federation of Civil Engineering Contractors, modified and added to by the MCD.

2.6 The Specification shall be prefaced by the Preamble as set out in Annex A. The Specification shall be the Specification and Method of Measurement (MoM) for Ground Investigation for Highway Works published by the Stationery Office Ltd (MCHW5.3). This shall not be reproduced in the contract documents but included by reference in the Preamble.

2.7 The Specification is a series of clauses describing how the work shall be carried out. It is not intended that these should be altered from contract to contract. However, a need may arise out of regional variations and scheme specific problems for changes to be made. Changes to the Specification will be listed in "Schedule 4" referred to in the Preamble.

2.8 Amendments shall not be made to the Specification without the prior approval of the Overseeing Organisation. Amended Clauses and Annexes are to be listed in Schedule 4 followed by the actual amendments produced in full, if major, or by deletion and insertion methods, if minor.

2.9 In addition to the above, there is a need to identify and describe what work is to be carried out. This is achieved by a series of Schedules given in Annex B and the Bill of Quantities (BoQ). Schedule 1 shall include the information required by virtue of Clause 1.2 of the Specification. Schedule 2 shall include location, depth, etc of Exploratory Holes. Schedule 3 shall list the requirements for the Engineer's office, office equipment, transport, protective clothing and survey equipment, etc.

2.10 The MoM shall be prefaced by the Preambles to The Bill of Quantities as set out in Annex C. The MoM shall be the Overseeing Organisations' MoM for Ground Investigation Contracts published with the Specification as in paragraph 2.6 above. As with the Specification, the MoM shall not be reproduced in the contract document but included by reference in the Preambles to the Bill of Quantities.

2.11 Amendments required to the MoM resulting from amendments made to the Specification shall be included in the contract document immediately following item 11 of the Preambles to the Bill of Quantities.

2.12 The BoQ shall be prepared based on the Method of Measurement for Ground Investigation published by the Stationery Office Ltd in the same document as the Specification. A library of standard item descriptions suitable for the BoQ is listed in Annex D.

2.13 The Design Organisation shall ensure that it possesses the latest amendments to the MCD, if necessary via enquiry through the Overseeing Organisation.

3. ANNEXES

3.1 The Annexes to this Standard introduce the Preamble to the Specification, the various Schedules required to complete the contract documentation, the Preambles to the Bill of Quantities and a library of standard item descriptions for compiling the BoQ. Guidance on the use and content of the Schedules is given in Notes for Guidance for the Specification for Ground Investigation (MCHW 5.3).

4. REFERENCES

4.1 Specification, Method of Measurement and Notes for Guidance for Ground Investigation for Highway Works published by the Stationery Office Ltd (MCHW5.3).

4.2 Advice Note SA9/97 “Ground Investigation Procedure”.

4.3 Institution of Civil Engineers Conditions of Contract for Ground Investigation First Edition (October 1983) published by Thomas Telford Ltd.

4.4 Model Contract Documents (MCD) for Ground Investigation Contracts (MCHW5.3) published by the Stationery Office Ltd and issued in appropriate versions by the Highways Agency, the Scottish Office Development Department, the Welsh Office and the Department of the Environment for Northern Ireland.

5. ENQUIRIES

All technical enquiries or comments on this Advice Note should be sent in writing as appropriate to:

Chief Highway Engineer
The Highways Agency
123 Buckingham Palace Road
London
SW1W 9HA

G CLARKE
Chief Highway Engineer

Chief Road Engineer
Scottish Executive
Victoria Quay
Edinburgh
EH6 6QQ

J HOWISON
Chief Road Engineer

Chief Highway Engineer
Transport Wales
Welsh Assembly Government
Cathays Parks
Cardiff
CF10 3NQ

M J A PARKER
Chief Highway Engineer
Transport Wales

Assistant Director of Engineering
The Department for Regional Development
Roads Service
Clarence Court
10-18 Adelaide Street
Belfast BT2 8GB

D O'HAGAN
Assistant Director of Engineering

ANNEX A

SPECIFICATION

Preamble

1. The Specification referred to in the Tender shall be the "Specification and Method of Measurement for Ground Investigation for Highway Works (MCHW5.3)", published by the Stationery Office Ltd, modified and extended by any Amended, Additional or Cancelled Clause or Table listed in Schedules 4 and 5.

2. An Amended Clause as indicated by the suffix "M" is a modification originating from the Overseeing Organisation. An Amended Clause suffixed "MR" is a regional or scheme specific modification.

3. An Additional Clause supplementing the Specification with a suffix "A" originates from the Overseeing Organisation. A Clause with suffix "AR" is a regional or scheme specific addition.

4. A Cancelled Clause is indicated by the suffix "C" or "CR" and is a Clause entirely deleted from the Specification either by the Overseeing Organisation, or a scheme specific cancellation respectively.

5. Insofar as any of the numbered Appendices, Additional or Amended Clauses may conflict or be inconsistent with any provision of the Specification for Ground Investigations, then the numbered Appendices, Amended or Additional Clauses shall always prevail.

6. Any reference in the Contract to a Clause number or Appendix shall be deemed to refer to any amended version of that Clause or Appendix as listed in Schedule 4.

7. Reference to Clauses shall apply equally to Tables. Where a Clause is amended, any Tables referred to in the original Clause shall apply unless the Table is also amended. When a Table is amended any reference in a clause to the original Tables shall apply to the amended Table.

8. Any Clauses or Appendices in the Specification which relate to work or materials not required for the Investigation shall be deemed not to apply.

9. Any Schedules referred to in the Specification which are not used shall be deemed not to apply.

ANNEX B

SAMPLE SCHEDULES

SCHEDULE 1

INFORMATION

1.1 Object and scope of the Contract

1.2 Description of the route or development

1.3 Schedule of Drawings

1.4 General description of the site operations including ancillary works

1.5 Geological formations likely to be encountered

1.6 List of affected landowners, tenants and occupiers (including appropriate landplans)

1.7 Form of monthly statement if required (Conditions of Contract Clause 60)

1.8 Particular general requirements (see NG on the Specification)

1.9 Particular borehole requirements (see NG on the Specification)

1.10 Particular rotary drilling requirements (see NG on the Specification)

1.11 Particular pit and trench requirements (see NG on the Specification)

1.12 Particular sampling requirements (see NG on the Specification)

1.13 Particular in situ testing requirements (see NG on the Specification)

1.14 Particular instrumentation and monitoring requirements (see NG on the Specification)

1.15 Particular laboratory testing requirements (see NG on the Specification)

1.16 Particular reporting requirements (see NG on the Specification)

SCHEDULE 2

SCHEDULE OF EXPLORATORY HOLES

Exploratory hole no.	National Grid Reference	Minimum Diameter (mm)	Probable Depths (m)	Approx. Ground Level (m)	Approx. formation level of Proposed road (m) or structure foundation level (marked S)	Location Features and Special Requirements

SCHEDULE 3

1.17 Particular requirements relating to potentially contaminated land (see NG on the Specification)
Engineer's office, equipment, transport, protective clothing and survey equipment

The Engineer's office together with all furnishings, services, equipment and vehicles detailed below shall be ready for occupation and use by the Engineer from the date of commencement of the Site Operations.

3.1 Accommodation

3.2 Furnishings

3.3 Services

3.4 Equipment

3.5 Vehicles

Note: The details under these headings will vary from contract to contract and have therefore not been inserted. It is also necessary to identify any item of equipment and the like which will become the property of the Engineer.

SCHEDULE 4

Specification Amendments

SCHEDULE 5

Specification Additions

ANNEX C

PREAMBLES TO BILL OF QUANTITIES

1. General directions

In this Bill of Quantities, the sub-headings and item descriptions identify the work covered by the respective items read in conjunction with the matters listed against the relevant marginal headings 'Item coverage' in Part IV of the Method of Measurement for Ground Investigation published by the Stationery Office Ltd (MCHW5.3). The nature and extent of the work is to be ascertained by reference to the Drawings, Specification Schedules and Conditions of Contract.

The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items including the following, unless expressly stated otherwise:

(i) Labour and costs in connection therewith.

(ii) The supply of materials, goods, storage and costs in connection therewith including delivery to Site. Taking delivery of materials and goods supplied by others, unloading, storage and costs in connection therewith.

(iii) Fixing, erecting and installing or placing of materials and goods in position, including Ancillary Works.

(iv) Equipment and costs in connection therewith.

(v) General obligations, liabilities and risk involved in the execution of the Works set forth or reasonably implied in the documents on which the tender is based.

(vi) Consultation with relevant local authorities and police in connection with traffic management matters.

(vii) Establishment charges, overheads and profit.

(viii) Waste.

2. Measurement

The measurement of work shall be computed net from the agreed records unless stated otherwise in the Method of Measurement.

3. Pricing of items

Each individual item shall have a rate or price entered against it. Rates and prices shall be expressed to two decimal places.

4. Privately and publicly owned services or supplies

The Contractor shall include in his rates and prices for taking measures for the support and full protection of pipes, cables and other apparatus during the progress of the Site Operations and for keeping the Engineer informed of all arrangements he makes with the owners of privately owned services, statutory undertakers and public authorities as appropriate.

5. Labours

Labours in connection with nominated sub-contractors shall include:

(i) in the case of work or services executed, for affording the use of existing working space, access, temporary roads, erected scaffolding, working shelters, staging, ladders, hoists, storage, latrines, messing, welfare and other facilities existing on Site and the provision of protection, water, electricity for lighting and clearing away rubbish and debris arising from the work.

(ii) in the case of goods, materials or services supplied, for taking delivery, unloading, storing, protecting and returning crates, cartons and packing materials.

6. Work within and below non-tidal water or tidal water

The Contractor shall allow in his rates and prices for taking measures required to execute the work separately measured as being within and below non-tidal open water or tidal water. For the measurement of work affected by non-tidal water or tidal water the datum stated in the Contract shall be used irrespective of the actual level encountered in the Site Operations.

7. Dealing with flows

The Contractor shall allow in his rates and prices for taking measures to deal with the existing flow of water, sewage and the like.

8. Schedule of rates for professional and technical staff

The schedule of rates for professional and technical staff shall be priced at the rates for the various grades of staff who will be employed in the preparation of the interpretative and advisory section of the report, or employed for advisory work for the Engineer on site on the conduct of the investigation, as required by the Engineer. This excludes the superintendence and technical direction required under Clause 15 of the Conditions of Contract which shall be covered by the rates and prices entered in the main Bill of Quantities.

9. Reimbursement by the employer of fees, rates, taxes and Engineer's telephone calls

The Employer will reimburse the Contractor the actual price paid by the Contractor in respect of:

(i) fees, rates and taxes - the sums certified by the Engineer as properly payable and repayable to the Contractor in accordance with Clause 26 of the Conditions of Contract.

(ii) Engineer's telephone calls and facsimile - the telephone calls charged to the number or numbers allocated to the Engineer.

Any other cost, charge or expense in respect of these items shall be allowed for in the rates and prices for temporary accommodation.

10. Work on potentially contaminated land or on samples taken from potentially contaminated land

The Contractor shall allow in his rates and prices for taking measures required to execute the work separately measured as being on potentially contaminated land or on samples taken from potentially contaminated land. The Contractor shall include in his rates and prices for such work for submitting and resubmitting statements of working arrangements, liaison with authorities and the Engineer, complying with hygiene and safety requirements, taking measures necessary to control activities and complying with particular requirements, taking measures in handling and storage of material, complying with particular testing requirements, replacement of solid arisings in pits and trenches and disposing of surplus material to a suitably licensed site.

11. Amendments to the Method of Measurement

For the purpose of this Contract, the Method of Measurement referred to in Preamble 1 General Directions is amended as follows:

[**Note*:*** Where amendments to Part IV of the MoM are required in accordance with paragraph 1(b) of General principles (ref: Part II of the MoM for GI), this preamble should be the last numbered preamble and inserted immediately prior to the amendments.]

ANNEX D

LIBRARY OF STANDARD ITEMS

1. Introduction

1.1 The library has been compiled in accordance with the itemisation features of the MoM of the Specification for Ground Investigation for Highway Works. This is a master library which can be used direct for compiling scheme specific BoQ, or as the basis for tailor-made computer software from which individual BoQ can be produced. Whichever process is followed, the end result should produce directly comparable Bills of Quantities.

1.2 The root narratives contain lettered inserts which can, by the use of a numbered variable from the appropriate lettered group, produce unique item descriptions for all standard work. For example, the information in the specification or on the drawings may show the requirements for a bored exploratory hole 175mm diameter 28m in depth raking.

By referring to the Ground Investigation section, unique item descriptions can be built up as follows:-

Section 2, Site Operations
Root Narrative Item 2 **- D** in a **E** exploratory hole **F** diameter **BG**
Variables
D1 = Cable Percussion Boring
E2 = raking
F4 = 175mm
B0 = no entry
G1 to 3 incl = in steps down to 30 meters below existing ground level

Similarly, a unique item description for infilling requirements which may be shown as 'Cement/Bentonite grout filling to hole 150mm diameter below piezometer' would be as follows:-

Root Narrative Item 15 - **H** filling to hole **F** diameter **U**
Variables
H4 = Cement/Bentonite
F3 = 150mm
U1 = below piezometer

2. Amendments to the Library

2.1 Any variable not listed in a group but belonging to a group generically may be added to it and numbered sequentially. Items which cannot be compiled from the existing root narratives are rogue items and if required they should be drafted on the same principles as the Standard Item Library and inserted as necessary in the BoQ.

Note: If the rogues and additional variables not contained in the Item Library are found to be consistently necessary and are of national application, they should be forwarded to the address of the respective Overseeing Organisation listed in Chapter 6.

SECTION 1 - PRELIMINARIES

Item	Root Narratives	Unit
	Temporary Accommodation	
1	Erection, servicing and dismantling of **A**	Item
	Vehicles for the Engineer	
2	**B** for the Engineer	v/wk
	Equipment	
3	Establishment on Site of all equipment **C**	Item
	Photographs	
4	- Photographs	No
5	**D** bound photograph volumes	No
6	Traffic Safety and Management	Item

SECTION 1 - PRELIMINARIES

Group	Variables
A	1 = Office for the Engineer 2 = Offices and Stores for the Contractor
Temporary Accommodation	Notes: 1. The precise details of the Engineer's requirements in the form of offices, together with any equipment, furniture, fittings, supplies and consumable stores should be given by means of Drawings and Schedules which should also separately identify any items of equipment and the like which will become the property of the Engineer. Supplies are those items which will require maintaining during the currency of the contract but which are capable of being returned to the Contractor when no longer required whilst consumable stores are those which only require replenishing such as soap, paper towels, toilet rolls and the like.
B	1 etc = [each type of vehicle]
C	0 = No Entry
D	1 etc = [number of bound photograph albums]

SECTION 2 - SITE OPERATIONS

Item	Root Narratives	Unit
	Moving of Equipment	
1	Moving of **A** Equipment to the site of each exploratory hole BC	No
	Boring	
2	**D** in a **E** exploratory hole **F** diameter **BG**	m
3	Backfilling **E** exploratory hole **F** diameter **G** with **H**	m
	Hard Strata and Obstructions	
4	Breaking out hard strata and obstructions with **D** equipment	h
	Rotary Drilling	
5	**I** in a **E** exploratory hole **J** diameter **BG**	m
6	Backfilling **E** exploratory hole **J** diameter **G** with **H**	m
	Pits and trenches	
7	Excavate in **K** for **LM**	m^3
8	Backfill **L** with **HM**	m^3
9	Leave open **L**	m^2/day
10	Pumping groundwater	h
	Probing	
11	**NOEBG**	m
	Standing time of Equipment	
12	Standing time of **A** equipment	h
	Sampling	
13	Take **P** sample **QR** by **S**	No
	Standpipes and piezometers	
14	Install **T** in hole **F** or **J** diameter	m
15	**H** filling to hole **F** or **J** diameter **U**	m
16	Piezometer porous element	No
17	**V** protective cover	No
18	Ground water level reading	No
19	Ground water pressure reading	No
20	Gas pressure and emission rate measurement	No
21	Removal of **T**	m

SECTION 2 - SITE OPERATIONS

Item	Root Narratives (cont'd)	Unit
	Insitu testing	
22	**W** test **X**	No
	Self boring pressuremeter	
23	Moving of pressuremeter test equipment to the site of each exploratory hole	No
24	Boring **B G**	m
25	Self boring to form a test pocket	No
26	Pressuremeter test for **Y**	No
27	Backfilling hole with **H**	m
	Closed circuit television surveys	
28	Moving of closed circuit television survey equipment to the site of each exploratory hole	No
29	Carry out closed circuit television surveys in exploratory holes	m

SECTION 2 - SITE OPERATIONS

Group	Variables
A	1 = Boring 2 = Drilling 3 = Grouting 4 = Probing 5 = Pitting and Trenching 6 = Power Auger 7 = Pumping
B	0 = No entry 1 = Over water 2 = Over mineshafts 3 = On a slope of gradient greater than 20%
C	0 = No entry
D	1 = Cable percussion boring 2 = Hand auger boring 3 = Power auger boring 4 = Percussive boring with tube window sampler
E	1 = Vertical 2 = Raking
F	1 = 100mm 2 = 125mm 3 = 150mm 4 = 175mm 5 = 200mm 6 = Other as specified
G	1 = between existing ground level to not exceeding 10 metres depth 2 = between 10 metres to not exceeding 20 metres depth 3 etc = between 20 metres to not exceeding 30 metres depth and so on in steps of 10 metres
H	1 = Excavated material 2 = Imported material 3 = Concrete 4 = Cement/Bentonite grout 5 = Sand 6 = Other as specified
I	1 = Open hole rotary drilling 2 = Rotary drilling to produce continuous cores

SECTION 2 - SITE OPERATIONS

Group	Variables (cont'd)
J	1 = 17.5mm 2 = 18.5mm 3 = 21.5mm 4 = 23.0mm 5 = 30.0mm 6 = 32.5mm 7 = 42.0mm 8 = 44.5mm 9 = 54.5mm 10 = 58.5mm 11 = 76.0mm 12 = 81.0mm 13 = 92.0mm 14 = 112.5mm 15 = 140.0mm 16 = 165.0mm
K	1 = Top soil 2 = Soil 3 = Hard material including pavement construction
L	1 = Inspection pit 2 = Trial pit 3 = Trial trench 4 = Observation pit 5 = Observation trench
M	1 = between ground level to not exceeding 1.2 metres in depth 2 = between 1.2 metres to not exceeding 3 metres in depth 3 etc = between 3 metres to not exceeding 4.5 metres in depth and so on in steps of 1.5 metre
N	1 = Dynamic probing 2 = Static probing
O	1 = By hand 2 = Electrical recording 3 = For soil gas surveys 4 = Gas valves and tubes
P	1 = Small disturbed 2 = Bulk disturbed 3 = Undisturbed 4 = Undisturbed block 5 = Groundwater 6 = Water 7 = Surface water 8 = Gas

SECTION 2 - SITE OPERATIONS

Group	Variables (cont'd)
Q	0 = No entry 1 etc = [unique diameter as required]
R	1 = Weighing not less than 1.0 kg 2 = Weighing not less than 25 kg 3 = Weighing not less than 50 kg 4 = Not less than 500ml 5 = Not less than 1000ml 6 = Length not less than 450mm 7 = Other as specified
S	0 = No entry 1 = Open tube sampling 2 = Piston sampling 3 = Thin-walled tube sampling 4 = Taking sample directly from exploratory holes 5 = Taking sample from groundwater sampling standpipes and combined gas monitoring/groundwater sampling standpipes 6 = Other as specified
T	1 = Standpipe 2 = Standpipe piezometer 3 = Pneumatic piezometer 4 = Vibrating wire piezometer 5 = Gas monitoring standpipe 6 = Ground water sampling standpipe 7 = Combined gas monitoring/ground water sampling standpipe
U	1 = Below piezometer 2 = Above piezometer 3 = Around piezometer 4 = Below standpipe 5 = Around standpipe 6 = Around ground water sampling standpipe 7 = Around gas monitoring standpipe
V	1 = Flush 2 = Projecting 3 = Other as specified

SECTION 2 - SITE OPERATIONS

Group	Variables (contd)
W	1 = Insitu density test 2 = Static cone penetration test (CPT) 3 = Dynamic probing (DP or DPSH) 4 = Standard penetration test (SPT) 5 = Plate loading test 6 = California Bearing Ratio (CBR) 7 = Insitu shear strength by vane 8 = Insitu apparent resistivity test 9 = Insitu redox potential test 10 = Constant head permeability test 11 = Variable head permeability test 12 = Packer permeability test 13 = Hand dynamic probing 14 = Other as specified
X	1 = Test duration up to 3 hours 2 = Test duration 3 hours to 6 hours 3 = Test duration 6 hours to 9 hours 4 = Test duration 9 hours to 12 hours 5 = Test duration 12 hours to 24 hours
Y	1 = Test duration up to 1.5 hours 2 = Test duration 1.5 hours to 3 hours

SECTION 3 - LABORATORY TESTING AND REPORTS

Item	Root Narratives	Unit
	Laboratory tests	
1	Carry out soil laboratory **A** test **C**	No
2	Carry out rock laboratory **B** test **C**	No
	Sample examination	
3	Examination and description of **D** in the laboratory	No
4	Examination and description of rock cores in the laboratory	m
	Extra over laboratory tests	
5	Carry out extra over laboratory test **E**	No
	Contamination tests	
6	Carry out tests to determine **F** in soil	No
7	Carry out tests to determine **F** in water	No
8	Carry out tests to determine **G** gas in sample	No
	Reports	
9	..... copies of factual reports	Item
10	..... copies of interpretative reports	Item
11	..... copies of digital data reports	Item

SECTION 3 - LABORATORY TESTING AND REPORTS

Group	Variable
A	2 = Moisture Condition Value (MCV) 3 = Liquid limit, plastic limit, plasticity index 4 = Particle density 5 = Particle size distribution 6 = Organic matter content 7 = Acid-soluble sulfur content of soil (05/05) 8 = Water-soluble sulfur content of ground water and aqueous soil extracts (05/05) 9 = pH value 10 = Carbonate content - standard method 11 = Carbonate content - simplified method 12 = Choride content 13 = Dry density/moisture content relationship 14 = Dry density 15 = California Bearing Ratio (CBR) 16 = One dimensional consolidation properties 17 = Consolidation test in a hydraulic cell 18 = Unconfined compressive strength 19 = Undrained triaxial compression without the measurement of pore water pressure (single stage) 20 = Undrained triaxial compression without the measurement of pore water pressure (multistage) 21 = Undrained shear strength for remoulded cohesive soil 22 = Consolidated undrained triaxial compression with the measurement of pore water pressure (single stage) 23 = Consolidated undrained triaxial compression with the measurement of pore water pressure (multi stage) 24 = Consolidated drained triaxial compression with measurement of volume change 25 = Consolidated undrained triaxial compression without the measurement of pore water pressure 26 = Isotropic triaxial compression 27 = Anisotropic consolidation in triaxial cell 28 = Permeability in triaxial cell 29 = Standard shearbox test 30 = Large shearbox test 31 = Drained strength and residual strength shearbox test 32 = Laboratory vane test 33 = Residual strength determination using small ring shear apparatus 34 = 10% fines value 35 = Frost heave test 36 = Chalk crushing value 37 = Hand vane test 38 = Total sulfur content (05/05) 39 = Initial consumption of lime 40 = Available lime content 41 = Moisture content for lime stabilisation studies

SECTION 3 - LABORATORY TESTING AND REPORTS

Group	Variable (cont'd)
A	42 = Moisture condition value for lime stabilisation studies 43 = Dry density/moisture content relationship for lime stabilisation studies 44 = CBR for lime stabilisation studies 45 = Swelling test for lime stabilisation studies 46 = Permeability test in a hydraulic consolidation cell 47 = Other as specified
B	1 = Natural water content 2 = Porosity/density 3 = Void index 4 = Carbonate content 5 = Petrographic description 6 = Slake durability index 7 = Soundness by solution of magnesium sulphate 8 = Shore sclerometer 9 = Schmidt rebound hardness 10 = Aggregate crushing value 11 = Ten percent fines 12 = Aggregate impact value 13 = Aggregate abrasion value 14 = Polished stone value 15 = Aggregate frost heave 16 = Uniaxial compressive strength 17 = Deformability in uniaxial compression 18 = Direct tensile strength 19 = Indirect tensile strength by Brazilian method 20 = Undrained triaxial compression without measurement of pore water pressure 21 = Undrained triaxial compression with measurement of pore water pressure 22 = Direct shear strength 23 = Swelling pressure index under conditions of zero volume change 24 = Swelling strain index for a radially confined specimen with axial surcharge 25 = Swelling strain developed in an unconfined rock specimen. 26 = Point load test 27 = Seismic velocity 28 = Other as specified
C	0= No entry 1 = of duration not exceeding 4 days 2 = of duration exceeding 4 days but not exceeding 7 days 3 = of duration exceeding 7 days but not exceeding 14 days 4 = of duration exceeding 14 days
D	1 = Small disturbed soil samples 2 = Bulk disturbed soil samples 3 = Open tube samples 4 = Piston samples 5 = Thin walled tube samples 6 = Undisturbed block samples

SECTION 3 - LABORATORY TESTING AND REPORTS

Group	Variables (cont'd)
E	1 = For amended moisture content drying procedure 2 = For correction to moisture content for material retained on a 425 micron sieve 3 = For correction to moisture content for water absorption 4 = For correction to moisture for dissolved salts
F	1 = Arsenic 2 = Cadmium 3 = Chromium 4 = Copper 5 = Lead 6 = Mercury 7 = Nickel 8 = Zinc 9 = Asbestos 10 = Total Cyanides 11 = Ferro/Ferricyanide 12 = Free Cyanides 13 = Thiocyanate 14 = Sulphide 15 = Ammoniacal nitrogen 16 = Mineral oils 17 = Phenols (Total) 18 = Phenols (Monohydric) 19 = Total Polyaromatic Hydrocarbons 20 = Biochemical Oxygen Demand (BOD) 21 = Chemical Oxygen Demand (COD) 22 = Other as specified
G	1 = Methane 2 = Carbon dioxide 3 = Oxygen 4 = Hydrogen 5 = Hydrogen sulphide 6 = Nitrogen 7 = Carbon Monoxide 8 = Other as specified