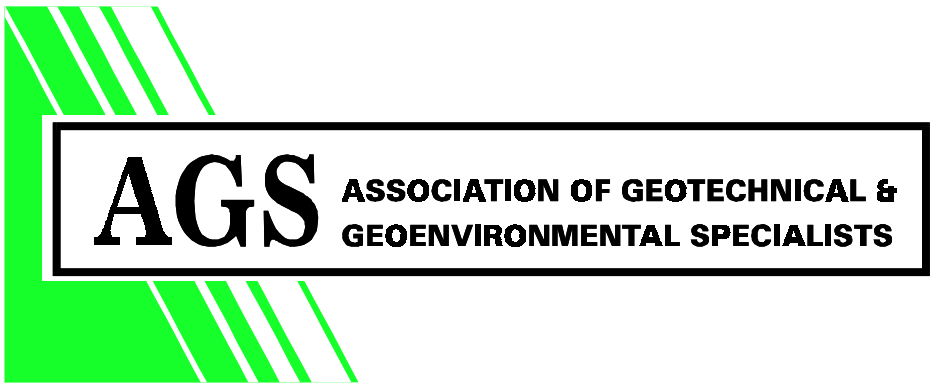
Electronic Transfer of Geotechnical and Geoenvironmental Data

(3rd Edition)

1999

Published by
Association of Geotechnical and Geoenvironmental Specialists



ACKNOWLEDGEMENTS

This document has been prepared by the Association of Geotechnical and Geoenvironmental Specialists (AGS) with the encouragement and support of the working party members. The AGS acknowledges the generous time and resources given to the project by the individual members and their employers. Without their enthusiastic support this ongoing project would not be possible.

Comment and feedback from the wider geotechnical industry has also been fundamental to the ongoing evolution of the AGS Format, ensuring that the needs of the geotechnical and geoenvironmental industry and its clients continue to be met.

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First Published 1992
Revised 1994
Revised 1999
ISBN 0 9519271 8 3

Edition No. 3 November 1999
Amendments

Edition No.	Date of issue	Amendment
03/92	March 1992	Original Issue
07/94	July 1994	Rules, Appendix 1, Appendix 2 and Appendix 3 amended as marked in margin.
3	November 1999	See Appendix 7

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FOREWORD

The use of computers to collect, collate and analyse data is now the accepted norm. This is complemented by a broad selection of software that has been developed to meet the widely differing elements of the geotechnical and geoenvironmental industry, ranging from determination of test data, to analysis and archive retrieval systems.

To maintain efficiency and reliability it is essential that all this software has access to the same technical data set; data should not have to be re-entered each time it is used. Achievement of this requires the data set to be in a standard format meeting agreed conventions and protocols known to all producing and receiving software. This was first met in 1992 when the first edition of the AGS Format was published after much consultation with the industry.

The AGS Format proved to be very successful in its aims and has been adopted in most specifications for ground investigations within the UK and by bodies in other countries who have been seeking to achieve similar objectives. This Third Edition is issued in order to ensure that it is kept up to date, to include new groups and fields and to allow non-standard groups or fields which future developments may render as standard. In addition, the structure has been modified to incorporate Associated Files which may be in other formats such as picture or CAD files. The Format has been shown to be robust and the amendments serve to clarify or amplify it rather than to change any fundamental concepts. This should encourage its widespread confident use throughout the industry world-wide.

This edition also introduces a fundamental change in philosophy through its use of the Internet. For the first time the document is available for universal downloading free of cost, recognising the widespread international adoption of the AGS Format as a default standard. The use of the Internet also allows features such as a discussion board with its question and answer facility and should improve the continual evolution of the Format.

Rodney Hutchison
Working Party Chairman

CONTENTS

CONTENTS

APPENDICES

1 INTRODUCTION

Prior to the establishment of the AGS Format, which has now been accepted by all components of the industry as being appropriate to data preparation, analysis, transfer and storage in electronic format, there was a proliferation of software systems that differed both in form and purpose even though much of their content was common. This was recognised by the Association of Geotechnical and Geoenvironmental Specialists (AGS) in 1991 and led to the setting up of a Working Party to establish an interchange format which allowed transfer of data between systems with minimal change to the systems themselves. The outcome of this work was embodied in the First Edition of this document. In 1994, following its success, the Second Edition was published containing a series of updates and developments reflecting the ongoing needs of the industry.

Computer technology has continued to advance and is now a fundamental part of the geotechnical industry. The producers of geotechnical data have adopted database systems for the efficient preparation and presentation of reports in printed format and the receivers for its analysis. Clearly, the transfer of data by electronic means to the receivers systems without the need for a printed interface helps to minimise costs, time and the potential for error. It also encourages more and better use of the data. However, much remains to be done to encourage the use of data in the electronic format, not only in site investigation but also in the design, bidding and construction phases of the project.

Most new systems for data recording and analysis now embody the AGS Format from inception. Once in place each system should be capable of interfacing with any other system which recognises the same format.

Whilst providing benefit in relation to data transfer, the AGS Format allows both producers and receivers to continue to use their own familiar forms and facilities and hence aids the implementation of quality assurance procedures. Storage and access to the data is rendered far more efficient and the establishment of data banks by producers, receivers and national bodies is facilitated.

This Third Edition continues the trend of updating the Format in response to industry requirements. In a major step to further encourage its use, the AGS has taken the decision to provide free access to the document through its web site. However, users are encouraged to register themselves when downloading in order that they can gain access to discussion boards and make suggestions for future developments.

The main enhancements included in this edition are the ability to append associated files such as drawing files, picture files and text files. Facilities for including rock discontinuity descriptions and “pick lists” for standard items such as hole and sample types as well as chemical test determinands are added. This last development reflects the development of chemical testing as part of the study of brown-field sites and other environmental investigations which have increased rapidly in recent years. It is envisaged that the “pick lists” will be subject to ongoing additions that will be posted on the web site on a periodic basis. Registered users of the AGS Format will be automatically informed of any updates. The concept of Additional Groups and Fields has been dropped leaving only Key and Common categories.

2 SCOPE

The transmission by electronic media of most of the data currently presented on forms such as Borehole Records, Trial Pit Records, In Situ Test Data and Laboratory Test Summaries, is considered a realistic objective. However, the transmission of **all** data, particularly from more complex testing, is not covered by this document.

Although the ability to record the descriptive introductory elements of a report on electronic media is considered desirable in order to provide compact storage, word processor functions such as tabulations, underlining and fonts could not be reproduced without the use of identical word processing packages by both producer and receiver. The format of the transmission of large bodies of text and drawings, if required, is covered by other means. However, the AGS Format now allows reference to these documents so that reports, drawings and photographs may also be transferred separately by electronic means.

3 USER SUPPORT

The benefits provided by Internet communications are now widely acknowledged. The AGS has therefore made provision on its web site not only for downloading of the document, but also for discussion boards so that user needs can be more readily identified. Similarly, any amendments can be immediately communicated to registered users. Further details are given in Appendix 5. The AGS web site can be found at **www.ags.org.uk**.

4 PRESENTATION

This document presents the AGS Format which should be adopted in conjunction with software used for the preparation of geotechnical and geoenvironmental data, its analysis and storage. It explains the concepts which have been used in preparing the format and the way in which it can be implemented in relation to future projects. The structure of data files is defined and examples are presented.

5 CONCEPTS

5.1 Base Data

In general, the files which are used should contain basic data such as exploratory hole records and the test data required to be reported by the relevant British Standards and other recognised documents and which would normally be contained within a Factual Report. Any calculated or interpreted data should be derived by the receiver, rather than being transferred within the data files.

5.2 File Format

The file format is intended to provide the widest possible level of acceptance and, in view of this, it is considered that the data should be transmissible using American Standard Code for Information Interchange (ASCII) files. The rules for creating Data Files are detailed in Section 10. They have been drawn up to enable the use of the AGS Format by the simplest existing programs, in particular spreadsheets, as well as more comprehensive database systems. An example AGS format file is given in Appendix 2.

5.3 Data Dictionary

In order to provide maximum flexibility and to allow the file formats to be more easily recognised by the non-specialist, the Data Dictionary approach has been adopted. The Data Dictionary can be compatible with a wide range of existing programs and should aid the structuring of future software. The Groups and Fields constituting the Data Dictionary are given in Section 11.

5.4 Groups and Fields

In order to structure the data in a consistent and logical manner it has been divided into Data Groups within which a series of Fields are defined. The Data Groups have been chosen to relate to specific elements of data which are obtained, such as project information, exploratory hole details and strata details. For data of a more complex nature it has been necessary to define two or more linked Data Groups.

Fields within each Data Group identify specific items such as stratum description, sample depth etc. They have been defined as having the status of **KEY** or **COMMON**.

Key Fields are necessary in order to define the data unambiguously. The Common Data Fields contain the associated data. The Data Fields and Data Groups listed are extensive and should cover the majority of requirements. However, rules are given for the creation of other Fields and Groups, should the need arise to transfer particular data not otherwise covered by the AGS Format. The AGS Format relies on strict adherence to the 'RULES' and the creation of additional Fields or Groups should be considered as a last resort.

It must also be recognised that there is a hierarchy of Groups, as most are reliant on others to maintain uniqueness of data. This hierarchy is defined in Section 10.3.

5.5 Units

Details of the default units to be used for each of the Data Fields are given in Section 11. These are the preferred units for each of the data dictionary definitions and should be used wherever possible. They will be either the appropriate SI units or the unit defined by the particular British Standard relating to that specific item of data. A “data units” field is included within the data set in accordance with the rules. It is recommended that these data units are used whenever possible in order to avoid potential confusion.

It is recognised that situations will occur where neither the SI unit nor the British Standard unit is being used. Provision is made for non-standard data units to be declared in the data transfer file. Reference should be made to Section 10.1; Rule 18 for the appropriate data format rules relating to non-standard units.

6 FILE SECURITY

6.1 Labelling

Clear labelling of files and media and conventions for its security and management are vital to the implementation of a practical system. These aspects are dealt with in Appendix 3.

6.2 Virus Protection

The transfer of data between computer systems can render the data vulnerable to attack by a virus. Precluding executable files from the data set reduces the risk of transfer of a virus. Proprietary virus scanning programs, of which there are a number commonly available, check the files for the presence of viruses. A virus-checking program should be used by the producer of the data to scan each data set medium prior to despatch and also by the receiver of the file before using it.

7 PRELIMINARY AND FINAL DATA

The data files are structured in order to allow the presentation of preliminary data as well as its updating during the course of a project, prior to issue of the final data. Preliminary data in electronic format can be useful on major projects where design is undertaken during the period of the investigation. However, the need for this facility needs to be very carefully considered by the receivers before including it in their Contract Specifications since it will require the imposition of rigorous management procedures. The highlighting of changes in data is considered to pose significant difficulties and hence preliminary data should be replaced by subsequent data and not merely updated by it. Where the highlighting of changes is required, this should be a facility incorporated in the receivers' software. This does not preclude submission of parts of the data on separate disks but the producer must ensure that the data within all separate issues are compatible, and that updates are carried through all sub-sets of the data. Each issue must be given a unique issue sequence number.

8 MANAGEMENT

In order to provide a framework, within which the data can be used, it is necessary to have specifications which fall into the following categories: -

National Specification
General Specification
Particular Specification

The National Specification is likely to include the general requirement for data in electronic format, whilst examples of General Specification clauses and Particular Specification clauses are presented in Appendix 4.

9 UPDATING

To meet the rapidly changing needs of its users the AGS Format must continue to develop. The publication of a First Edition in 1992, and a Second Edition in 1994, both in hard copy forms have achieved promulgation of changes. However, the broadening of the user base has required more flexibility for updating and dissemination of the amendments. It was therefore decided to make use of the AGS web site to publish this Third Edition. Whilst placing the Format in open access on the web site permits more frequent updates, all changes are subject to rigorous control and notification procedures. Extensions to the Format will become necessary from time to time but any modification cannot be considered to comply with the AGS format until it has been approved by the AGS. Further details are given in Appendix 5.

Any problems in the use of this format that may arise from time to time should be brought to the attention of the AGS via the discussion board on the AGS website. Problems with proprietary software, however, should be directed to the suppliers.

10 RULES

The Rules have been the subject of much discussion and these notes seek to explain the overall framework within which they are formulated.

A fundamental consideration has been that potential users of the Format should be able to use standard software tools to produce the data files. The spreadsheet is the most basic tool for the task, allowing data "tables" to be created and ASCII data files to be produced. Likewise, data files produced according to the Rules can be read directly by spreadsheet software. Although the Rules make it possible for users to manipulate AGS data files using spreadsheets alone, it is to be expected that more specific software will be used to automate the reading and writing of the data files. These software systems may range from simple data entry and edit programs through to complete database systems with data translation modules for AGS files.

Another fundamental point to bear in mind when assessing these Rules is that the resulting data file has been designed to be easy for the computer to read. The data files do not replace the printed reports which they accompany. However, the layout does allow data items to be readily identified should the need arise.

10.1 The Rules

The following rules must be used when creating an AGS Format file.

Rule 1
The data file shall be entirely composed of ASCII characters. The extended ASCII character set must not be used.

Rule 2
Each data file shall contain one or more data GROUPs. Each data GROUP contains related data.

Rule 3
Within each GROUP, data items are contained in data FIELDs. Each data FIELD contains a single data VARIABLE. Each line of the AGS Format file can contain several data FIELDs.

Rule 4
The order of data FIELDs on each line within a GROUP is defined at the head of each GROUP by a set of data HEADINGs.

Rule 5
Data HEADINGs and GROUP names must be taken from the approved Data Dictionary for data covered by these. In cases where there is no suitable entry, a user-defined HEADING may be used in accordance with Rules 21,22 and 23.

Rule 6
The data HEADINGs fall into one of 2 categories: KEY or COMMON

KEY fields must appear in each GROUP, but may contain null data (see Rule 15).
KEY fields are necessary to uniquely define the data.

The following sub-rules apply to KEY fields and are required to ensure Data Integrity.
(See Note 3)

Rule 6a
*HOLE_ID should always be the first field except in the **PROJ GROUP, where *PROJ_ID should be the first field. *HOLE_ID is also omitted from the **ABBR,**DICT, **CODE , **UNIT and **FILE GROUPs.

Rule 6b
There must not be more than one line of data in each GROUP with the same combination of KEY field entries.

Rule 6c
Within each project every data entry made in the KEY fields in any GROUP must have an equivalent entry in it's PARENT GROUP.

e.g. All HOLES referenced in any GROUP must be defined in the **HOLE GROUP.
See GROUP HIERARCHY TABLE in Section 10.3.

Rule 7
All data VARIABLEs can contain any alphanumeric data (i.e. both text and numbers). Numerical data should be in numerals. e.g. 10 not TEN. (See also Note 2).
Note that all numerals must be presented as a text field.

Rule 8
Data GROUP names, data field HEADINGs and data VARIABLEs must be enclosed in double quotes ("...").
e.g. for inches or seconds, (") must not appear as part of the data variable.

Rule 9
The data field HEADINGs and data VARIABLEs on each line of the data file should be separated by a comma (,).

Rule 10
Each GROUP name shall be preceded by 2 asterisks (**).

e.g. "**HOLE"

Rule 11
HEADINGs shall be preceded by 1 asterisk (*).

e.g. "*HOLE_ID"

Rule 12
No line of data HEADINGs or data VARIABLEs shall exceed 240 characters. The character count should include delimiting quotes and commas.

e.g. "*HOLE_ID","*HOLE_NATE" = 23 characters

Rule 13
A line of data HEADINGs exceeding 240 characters can be continued on immediately following lines. A data HEADING must not itself be split between lines. A comma must be placed at the end of a HEADINGs line that is to be continued.

e.g. "*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SPEC_REF",
"*CLSS_LL","*CLSS_PL","*CLSS_BDEN"

Rule 14
A line of data VARIABLEs exceeding 240 characters must be continued on immediately following lines. Data VARIABLEs can be split between lines. A VARIABLE continuation line shall begin with the special name <CONT> in place of the first data VARIABLE (PROJ_ID or HOLE_ID). The continued data is then placed in the correct field order by inserting the appropriate number of Null data VARIABLEs before it. Note that each line of data in a GROUP should contain the same number of VARIABLEs.
(See also Note 4).

e.g.
```
"**GEOL"
"*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC","*GEOL_LEG"
"<UNITS>","m","m","",""
"501","1.2","2.4","Very stiff brown CLAY with",""
"<CONT>","","","extremely closely spaced fissures","CLAY"
```

Rule 15
Null data VARIABLEs must be included as 2 consecutive double quotes ("").
(See also Note 2)

e.g. ,"",

Rule 16
Data GROUPs can be repeated within a file with different HEADINGs.

Rule 17
The number of data HEADINGs per GROUP shall not exceed 60.

Rule 18
A UNITS line must be placed immediately after the HEADINGS line in all GROUPs except **ABBR, **CODE,**DICT and **UNIT. An entry must be made for each data VARIABLE. Null entries ("") must be used for data VARIABLES that are unitless, e.g. text. The line must begin with the special name <UNITS> in place of the first data variable (PROJ_ID or HOLE_ID).
(See also Note 5)

e.g.
```
"**GEOL"
"*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC"
"<UNITS>","m","m",""
```

Rule 18a
A line of UNITS exceeding 240 characters can be continued on immediately following lines. A UNIT must not itself be split between lines. A comma must be placed at the end of a UNITS line that is to be continued.

e.g.
```
"**GEOL"
"*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC"
"<UNITS>","m",
"m",""
```

Rule 18b
Each data file shall contain the **UNIT GROUP. See Section 11 for the **UNIT GROUP defining the units used. This GROUP uses units defined in the 'pick' list in Appendix 1 which contains all the standard SI units used in all other AGS GROUPs, as well as some common non-SI equivalents. Every UNIT entered in a <UNITS> line of a GROUP and the CNMT_UNIT field of the **CNMT GROUP must be defined in the **UNIT GROUP. Both standard and non-standard UNITS must be defined in the **UNIT GROUP.

Rule 19
Each data file shall contain the **PROJ GROUP.

Rule 20
Each data file shall contain the **ABBR GROUP to define any data abbreviations where these have been used as data entries in the data GROUPs. This applies to standard abbreviations selected from the 'pick' lists in Appendix 1 and user defined abbreviations.

Rule 21
Each file shall contain the **DICT GROUP to define non-standard GROUP and HEADING names where these have been used in the data GROUPs.

Rule 22
Each non-standard GROUP name shall contain the prefix **?.
A GROUP name shall not be more than 4 characters long excluding the **? prefix and shall consist of uppercase letters only.

e.g. "**?TESX"

Rule 23
Each non-standard HEADING shall contain the prefix *?.
A HEADING name shall not be more than 9 characters long excluding the *? prefix and shall consist of uppercase letters, numbers or the underscore character only. HEADING names shall start with the GROUP name followed by an underscore character, except for HEADINGs which duplicate a HEADING in another GROUP, in which case this HEADING shall be used instead.

e.g. "*?ISPT_CALN"

Rule 24
Miscellaneous computer files (e.g. digital images) may be included with a data file. Each such file should be defined in a **FILE GROUP. File names shall not contain more than 8 characters in the main body and not more than 3 characters in the extension.

Correct example:	FNAME.XLS
Incorrect example:	A LONG NAME.XYZ

Rule 25
Every data file that contains a **CNMT GROUP for chemical test results must also contain a **CODE GROUP that defines the codes used for each determinand given in the CNMT_TYPE field of the **CNMT GROUP. This applies to standard codes selected from the 'pick' lists in Appendix 1 and user defined codes.

10.2 Notes on the Rules

The following notes explain some points of detail in the Rules.

Note 1
ASCII 'CSV' Files

The Rules define ASCII data files of a type commonly referred to as CSV (Comma Separated Value). This type of file is produced and read by some spreadsheet (and other) systems. The data items are separated by commas and are surrounded by quotes (").

Note 2
Numeric and Character Data - Delimiters

The Rules permit any Data Field to contain text, since this allows characters in numeric fields and caters for those countries which use the comma in place of the decimal point. For these reasons ALL Data Fields must be surrounded by quotes.

Note that most spreadsheet and database systems provide a VALUE( ) function (or similar) to convert text data to numeric data. This function can be used where calculations need to be carried out on data imported from AGS files.

Note 3
Key and Common Fields

The Data Fields defined by the Format fall into one of two categories:

KEY Fields must be included every time a Data Group appears in a data file.
COMMON Fields are all other fields.

KEY Fields are important for maintaining data integrity. Without this the receiving software may not be able to use the data in a meaningful way.

For the purpose of creating AGS files this means that data entered into KEY Fields must be unique in each GROUP and that the corresponding entries are made in the PARENT GROUP. See GROUP HIERARCHY TABLE (Section 10.3).

Note 4
Continuation Lines

It should be noted that some spreadsheets impose a finite limit (e.g. 240) on the number of characters within a single Data Field. The Rules define a scheme for producing continuation lines where there are long Data Fields. Although the scheme may seem complex at first sight, it is the system automatically produced by spreadsheets if the long data items are continued on additional rows IN THE SAME DATA COLUMN. Similarly, these Data Files will read into spreadsheets and preserve the long data items in their correct column order, for any length of data. The special <CONT> symbol must appear in the HOLE_ID Field, and thus <CONT> should never be used as a HOLE_ID.

Note 5
Units

Note that a UNITS line must be included in every GROUP (except ABBR, CODE, DICT and UNIT) **even where the default units are used.**

Details of the default units to be used for each of the Data Fields are given in the Data Groups below. These are the preferred units for each of the data dictionary definitions and should be used wherever possible. They will either be the appropriate SI units or the unit defined by the particular British Standard relating to that specific item of data. It is recognised that situations will occur where neither the SI unit nor the British Standard unit are being used. All entries in the <UNITS> line must be defined in the **UNIT GROUP.

10.3 Group Hierarchy

The AGS Format Data Groups are organised in a hierarchy with an inverted tree like structure. At the top of the tree is the HOLE Group, and all other Groups lie below this. One of the Groups immediately below HOLE is SAMP, all the laboratory testing Groups lie below SAMP. HOLE is termed the "parent" Group of SAMP. Each Group has only one parent, but there can be many Groups below each parent. Each Group is linked to its parent (the Group above it in the hierarchy) by Key Fields. Equally, each Group is linked to the Group(s) below it by Key Fields. For this structure to work, and the link to be made correctly between related Groups, the data in the Key Fields must be consistent and unique. If a Data Group is included in an AGS submission, its parent Group must also be included, and this applies all the way up to the top of the tree. Therefore the HOLE Group must always be present and if there is any laboratory testing the SAMP Group must be present.

The following table defines the Group hierarchy by indicating the parent for each Group. The Key Fields that create the link between these Groups are indicated in the Data Dictionary below.

There are six Groups that are not part of this hierarchy. The PROJ, ABBR, CODE, DICT, FILE and UNIT Groups sit above the tree, and each have a general purpose. The PROJ, ABBR and UNIT Groups must always be included in an AGS Format submission as they define the project, the abbreviations and the units used within the Groups. The CODE Group must be included if the CNMT Group is used for chemical test results, as the CODE Group defines the determinand codes used within CNMT. The DICT Group must be included if any user defined Groups or Fields are present. The FILE Group must be included if any associated files (non-AGS format files) are included in the submission.

Group Name	Contents	Parent Table	
ABBR	Abbreviation Definitions		***New***
CBRG	CBR Test - General	SAMP	
CBRT	CBR Test	CBRG	
CDIA	Casing Diameter by Depth	HOLE	***New***
~~**CHEM**~~	~~Chemical Tests~~	~~SAMP~~	***Del***
CHIS	Chiselling Details	HOLE	***New***
CHLK	Chalk Tests	SAMP	
CLSS	Classification Tests	SAMP	
CMPG	Compaction Tests General	SAMP	
CMPT	Compaction Tests	CMPG	
CNMT	Contaminant and Chemical Testing	SAMP	
CODE	Chemical Testing Codes		***New***
CONG	Consolidation Test - General	SAMP	
CONS	Consolidation Test	CONG	
CORE	Rotary Core Information	HOLE	
DETL	Stratum Detail Descriptions	HOLE	
DICT	User Defined Groups and Headings		***New***
DISC	Discontinuity Data	HOLE	***New***
DPRB	Dynamic Probe Test	DPRG	
DPRG	Dynamic Probe Test - General	HOLE	***New***
DREM	Depth Related Remarks	HOLE	
FILE	Associated Files		***New***
FLSH	Rotary Core Flush Details	HOLE	***New***
FRAC	Fracture Spacing	HOLE	
FRST	Frost Susceptibility	SAMP	
~~**GAST**~~	~~Gas Constituents~~	~~SAMP~~	***Del***
GEOL	Stratum Descriptions	HOLE	
GRAD	Particle Size Distribution Analysis Data	SAMP	
HDIA	Hole Diameter by Depth	HOLE	
HOLE	Hole Information		
HPGI	Horizontal Profile Gauge Installation Details	HOLE	
HPGO	Horizontal Profile Gauge Observations	HPGI	
ICBR	In Situ CBR Test	HOLE	
IDEN	In Situ Density Test	HOLE	
INST	Single Point Instrument Installation Details	HOLE	
IOBS	Single Point Instrument Readings	INST	
IPRM	In Situ Permeability Test	HOLE	
IRDX	In Situ Redox Test	HOLE	
IRES	In Situ Resistivity Test	HOLE	
ISPT	Standard Penetration Test Results	HOLE	
IVAN	In Situ Vane Test	HOLE	

Group Name	Contents	Parent Table	
MCVG	MCV Test - General	SAMP	
MCVT	MCV Test	MCVG	
POBS	Piezometer Readings	PREF	
PREF	Piezometer Installation Details	HOLE	
PROB	Profiling Instrument Readings	PROF	
PROF	Profiling Instrument Installation Details	HOLE	
PROJ	Project Information		
PRTD	Pressuremeter Test Data	PRTG	
PRTG	Pressuremeter Test Results, General	HOLE	
PRTL	Pressuremeter Test Results, Individual Loops	PRTG	
PTIM	Hole Progress by Time	HOLE	
PTST	Laboratory Permeability Tests	SAMP	
PUMP	Pumping Test	HOLE	
RELD	Relative Density Test	SAMP	
ROCK	Rock Testing	SAMP	
SAMP	Sample Reference Information	HOLE	
SHBG	Shear Box Testing - General	SAMP	
SHBT	Shear Box Testing	SHBG	
STCN	Static Cone Penetration Test	HOLE	
SUCT	Suction Tests	SAMP	
TNPC	Ten Per Cent Fines	SAMP	
TRIG	Triaxial Test - General	SAMP	
TRIX	Triaxial Test	TRIG	
UNIT	Definition of <UNITS> and CNMT_UNIT		***New***
WETH	Weathering Grades	HOLE	***New***
WSTK	Water Strike Details	HOLE	

See Section 11 for definitions of ***New***, ***Rev*** and ***Del***

11 DATA DICTIONARY

11.1 Data Sets

This Section defines the data dictionary entries for the Data Groups with their associated Key and Common Data Fields.

The status of the individual Data Fields is shown by

Status	Symbol
KEY	*
COMMON	

11.2 Units of Measurement

The units of measurement shall be those given in the UNITS line. The preferred units are defined. The unit of measurement shall not be included in the ASCII Data Field.

11.3 Examples

Typical examples are given against most of the Data Fields to indicate the type of information which may be expected. They are not intended to be representative of any one soil or rock and hence may not be mutually compatible.

11.4 Notes

See Appendix 1 for a list of the standard abbreviations to be used in the indicated fields. Other abbreviations may be defined as required, see Rules 20 and 25.

11.5 Key to Change Control Used

New New Field or Group in Edition 3
Rev Revised from previous edition
Del Field or Group maintained for backward compatibility. Its use should be discontinued. It will be deleted in the next edition of the AGS Format, as the data is contained in other Groups.

Group Name : PROJ - Project Information

Status	Heading	Unit	Description	Example	
*	**PROJ_ID**		Project identifier	6421/A	
	PROJ_NAME		Project title	Acme Gas Works	
	PROJ_LOC		Location of site	London Road, Croydon	
	PROJ_CLNT		Client name	Acme Enterprises	
	PROJ_CONT		Contractors name	Acme Drilling Ltd	
	PROJ_ENG		Project Engineer	Acme Consulting	
	PROJ_MEMO		General project comments		
	PROJ_DATE	dd/mm/yyyy	Date of production of data	31/07/1999	***Rev***
	PROJ_AGS		AGS Edition Number	3	***Rev***
	FILE_FSET		Associated file reference	FS1	***New***

Group Name : ABBR - Abbreviations					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**ABBR_HDNG**		Field Heading in Group	HOLE_TYPE	***New***
	ABBR_CODE		Abbreviation used	TP	***New***
	ABBR_DESC		Description of Abbreviation	Trial pit/Trench	***New***

Group Name : CBRG - CBR Test – General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6491/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	22	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
	CBRG_COND		Sample condition	Undisturbed, Remoulded etc	
	CBRG_METH		Method of remoulding	Heavy compaction	
	CBRG_REM		Notes on CBR test	Natural, soaked, duration of soaking, 10kN/m^2 surcharge	
	CBRG_NMC	%	Natural moisture content	20	
	CBRG_2ØØ	%	Weight percent retained on 20mm sieve	10	
	CBRG_SWEL	mm	Amount of swell recorded	3.0	
	FILE_FSET		Associated file reference	FS16	***New***

Group Name : CBRT - CBR Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6491/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	22	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
*	**CBRT_TESN**		CBR test number	1	
	CBRT_TOP	%	CBR at top	6.4	
	CBRT_BOT	%	CBR at bottom	5.2	
	CBRT_MCT	%	Moisture content at top	15	
	CBRT_MCBT	%	Moisture content at bottom	14	
	CBRT_BDEN	Mg/m3	Bulk density	1.84	
	CBRT_DDEN	Mg/m3	Dry density	1.60	

Group Name : CDIA - Casing Diameter by Depth					New
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***New***
*	**CDIA_CDEP**	m	Depth achieved at CDIA_HOLE	18.0	***New***
	CDIA_HOLE	mm	Casing Diameter	200	***New***
	CDIA_REM		Remarks		***New***

Group Name : CHEM - Chemical Tests **N.B. Provision for reporting of this data is included in group CNMT, group CNMT should be used in preference. Group CHEM will be deleted from future editions.**					*Del*
Status	**Heading**	**Unit**	**Description**	**Example**	
~~*~~	~~**HOLE_ID**~~		~~Exploratory hole or traverse name/number~~	~~6421/A~~	***Del***
~~*~~	~~**SAMP_TOP**~~	~~m~~	~~Depth to TOP of test sample~~	~~6.50~~	***Del***
~~*~~	~~**SAMP_REF**~~		~~Sample reference number~~	~~12~~	***Del***
~~*~~	~~**SAMP_TYPE**~~		~~Sample type~~	~~U (See Appendix 1)~~	***Del***
~~*~~	~~**SPEC_REF**~~		~~Specimen reference number~~	~~1~~	***Del***
~~*~~	~~**SPEC_DPTH**~~	~~m~~	~~Specimen depth~~	~~6.60~~	***Del***
	~~**CHEM_TSUL**~~	~~%~~	~~Total soil or rock sulphate content~~	~~0.06~~	***Del***
	~~**CHEM_ASUL**~~	~~g/l~~	~~Sulphate aqueous extract 2:1 soil/water~~	~~0.17~~	***Del***
	~~**CHEM_WSUL**~~	~~g/l~~	~~Water sulphate content~~	~~0.01~~	***Del***
	~~**CHEM_TSUD**~~	~~%~~	~~Total soil or rock sulphur content~~	~~0.04~~	***Del***
	~~**CHEM_PH**~~		~~Soil/water pH value~~	~~7.2~~	***Del***
	~~**CHEM_REM**~~		~~Remarks~~		***Del***
	~~**CHEM_ORGM**~~		~~Method of organic test~~	~~Dichromate~~	***Del***
	~~**CHEM_ORG**~~	~~%~~	~~Organic matter content~~	~~12~~	***Del***
	~~**CHEM_020**~~	~~%~~	~~Percentage passing 2mm sieve~~	~~80~~	***Del***
	~~**CHEM_LOI**~~	~~%~~	~~Mass loss on ignition~~	~~26~~	***Del***
	~~**CHEM_CO2M**~~		~~Method of carbonate test~~		***Del***
	~~**CHEM_CO2**~~	~~%~~	~~Carbonate content (as CO_2)~~	~~15~~	***Del***
	~~**CHEM_ACL**~~	~~%~~	~~Percentage of acid soluble chloride ions~~	~~0.1~~	***Del***
	~~**CHEM_WCL**~~	~~%~~	~~Percentage of water soluble chloride ions~~	~~0.05~~	***Del***
	~~**CHEM_DCL**~~	~~mg/l~~	~~Dissolved chloride ions~~	~~70~~	***Del***
	~~**CHEM_CLN**~~		~~Notes on chloride test~~		***Del***
	~~**CHEM_TDSM**~~		~~Total dissolved solids, test method and notes~~		***Del***
	~~**CHEM_TDS**~~	~~%~~	~~Total dissolved solids in water~~	~~1.0~~	***Del***
	~~**CHEM_RESM**~~		~~Resistivity test method~~		***Del***
	~~**CHEM_RES**~~	~~ohm~~	~~Resistivity of soil sample corrected to 20 degrees C~~	~~2000~~	***Del***
	~~**CHEM_REMC**~~	~~%~~	~~Moisture content of sample for resistivity~~	~~11.0~~	***Del***
	~~**CHEM_REBD**~~	~~Mg/m3~~	~~Bulk density of sample for resistivity~~	~~2.10~~	***Del***
	~~**CHEM_RDXM**~~		~~Redox test information~~		***Del***
	~~**CHEM_RDX**~~		~~Redox potential~~	~~400~~	***Del***
	~~**CHEM_RDPH**~~		~~pH of redox sample~~	~~7.0~~	***Del***

Group Name : CHIS - Chiselling Details					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***New***
*	**CHIS_FROM**	m	Depth at start of chiselling	5.20	***New***
	CHIS_TO	m	Depth at end of chiselling	5.35	***New***
	CHIS_TIME	hhmm	Time taken	0030	***New***
	CHIS_TOOL		Chiselling tool used	Shell	***New***
	CHIS_REM		Chiselling notes	Chiselling sandstone boulder	***New***

Group Name : CHLK - Chalk Tests					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6131/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	2.50	
*	**SAMP_REF**		Sample reference number	10	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	2.50	
*	**CHLK_TESN**		Chalk crushing test number	1	
	CHLK_CCV		Chalk crushing value as BS 1377 Part 4 Cl 6	3.5	
	CHLK_MC	%	Chalk natural moisture content	20	
	CHLK_SMC	%	Chalk saturated moisture content	25	
	CHLK_Ø1Ø	%	Weight percent of material retained on 10mm sieve		
	CHLK_REM		Remarks		
	CHLK_CARB	%	Chalk calcium carbonate content	42	
	FILE_FSET		Associated file reference	FS21	***New***

Group Name : CLSS - Classification Tests					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	1	
*	**SPEC_DPTH**	m	Specimen depth	6.60	
	CLSS_NMC	%	Natural moisture content	57	
	CLSS_LL	%	Liquid limit	62	
	CLSS_PL	%	Plastic limit	38 or NP	
	CLSS_BDEN	Mg/m3	Bulk density	1.66	
	CLSS_DDEN	Mg/m3	Dry density	1.06	
	CLSS_PD		Particle density	2.65	
	CLSS_425	%	Percentage passing 425 μm sieve	12	
	CLSS_PREP		Method of preparation	Wet sieve etc	
	CLSS_SLIM	%	Shrinkage limit	17	
	CLSS_LS	%	Linear shrinkage	11	
	CLSS_HVP	kN/m2	Hand vane undrained shear strength (peak)	40	
	CLSS_HVR	kN/m2	Hand vane undrained shear strength (remoulded)	15	
	CLSS_PPEN	kN/m2	Pocket penetrometer undrained shear strength	40	
	CLSS_VNPK	kN/m2	Laboratory vane undrained shear strength (peak)	35	***New***
	CLSS_VNRM	kN/m2	Laboratory vane undrained shear strength (remoulded)	25	***New***

Group Name : CMPG - Compaction Tests - General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	7.50	
*	**SAMP_REF**		Sample reference number	15	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	7.50	
	CMPG_TYPE		Compaction test type	2.5kg, 4.5kg or vibro	
	CMPG_MOLD		Compaction mould type	Standard or CBR	
	CMPG_375	%	Weight percent of material retained on 37.5mm sieve	7	
	CMPG_2ØØ	%	Weight percent of material retained on 20mm sieve	15	
	CMPG_PDEN		Particle density measured or assumed (#)	#2.65	
	CMPG_MAXD	Mg/m3	Maximum dry density	2.06	
	CMPG_MCOP	%	Moisture content at maximum dry density	14	
	CMPG_REM		Notes on compaction test required under BS 1377: 1990		
	CMPG_FSET		Associated file reference	FS23	***New***

Group Name : CMPT - Compaction Tests					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	7.50	
*	**SAMP_REF**		Sample reference number	15	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	7.50	
*	**CMPT_TESN**		Compaction point number	1	
	CMPT_MC	%	Moisture content	7.8	
	CMPT_DDEN	Mg/m3	Dry density at CMPT_MC moisture content	1.85	

Group Name : CNMT - Contaminant and Chemical Testing					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	4	
*	**SPEC_DPTH**	m	Specimen depth	6.90	
*	**CNMT_TYPE**		Determinand	CL (See Appendix 1)	***Rev***
*	**CNMT_TTYP**		Test type	SOLID_WAT (See Appendix 1)	***New***
	CNMT_RESL		Test result		
	CNMT_UNIT		Test result units	(See Appendix 1)	***Rev***
	CNMT_CAS		Chemical Abstract Service registry number (where appropriate)		***New***
	CNMT_METH		Test method		
	CNMT_PREP		Sample preparation	Air dried	
	CNMT_REM		Comments on test		
	CNMT_LIM		Method detection limit		***Rev***
	CNMT_NAME		Client/laboratory preferred name of determinand	Dry weight Chloride	***New***
	CNMT_LAB		Name of testing laboratory/Organisation	Chemical Test House	***New***
	CNMT_CRED		Accrediting body (When appropriate)	UKAS	***New***
	FILE_FSET		Associated file reference	FS22	***New***

Group Name : CODE - CNMT 'Pick' List Codes					***New***
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**CODE_CODE**		Code	CL	***New***
	CODE_DESC		Code Description	Chloride	***New***

Group Name : CONG - Consolidation Test - General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	4	
*	**SPEC_DPTH**	m	Specimen depth	6.90	
	CONG_TYPE		Oedometer or Rowe, primary or secondary consolidation	Oed, Rowe	
	CONG_COND		Sample condition	Undisturbed, remoulded etc	
	CONG_REM		Test details including method statement	Log time method, temperature 21 degrees C, sample from base of U100 sample, axis vertical	
	CONG_INCM	m2/MN	Coefficient of volume compressibility over CONG_INCD	0.36	
	CONG_INCD	kN/m2	Defined stress range	p'o to p'o+ 100	
	CONG_DIA	mm	Test specimen diameter	75	
	CONG_HIGT	mm	Test specimen height	19	
	CONG_MCI	%	Initial moisture content	21	
	CONG_MCF	%	Final moisture content	18	
	CONG_BDEN	Mg/m3	Initial bulk density	2.12	
	CONG_DDEN	Mg/m3	Initial dry density	1.75	
	CONG_PDEN		Particle density (BS 1377) with # if assumed	#2.65	
	CONG_SATR	%	Initial degree of saturation	98	
	CONG_SPRS	kN/m2	Swelling pressure	100	
	CONG_SATH	%	Height change of specimen on saturation as percentage of original height	+1.1	
	FILE_FSET		Associated file reference	FS9	***New***

Group Name : CONS - Consolidation Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	4	
*	**SPEC_DPTH**	m	Specimen depth	6.90	
*	**CONS_INCN**		Oedometer stress increment number	3	
	CONS_IVR		Initial voids ratio	0.80	
	CONS_INCF	kN/m2	Stress at end of stress increment/decrement	400	
	CONS_INCE		Voids ratio at end of stress increment	0.62	
	CONS_INMV	m2/MN	Coefficient of volume compressibility over stress increment	0.32	
	CONS_INCV	m2/yr	Coefficient of consolidation over stress increment	4.12	
	CONS_INSC		Coefficient of secondary compression over stress increment	0.12	

Group Name : CORE - Rotary Core Information					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6423/A	***Rev***
*	**CORE_TOP**	m	Depth to TOP of core run	2.54	
*	**CORE_BOT**	m	Depth to BOTTOM of core run	3.54	
	CORE_PREC	%	Percentage of core recovered in core run (TCR)	32	
	CORE_SREC	%	Percentage of solid core recovered in core run (SCR)	23	
	CORE_RQD	%	Rock Quality Designation for core run (RQD)	20	***Rev***
	CORE_REM		Rotary remarks	Rods dropped 200mm at 3.10m	***Rev***
	CORE_DIAM	mm	Core diameter	75	
	FILE_FSET		Associated file reference	FS5	***New***

Group Name : DETL - Stratum Detail Descriptions					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**DETL_TOP**	m	Depth to TOP of detail description	3.46	
*	**DETL_BASE**	m	Depth to BASE of detail description	3.76	
	DETL_DESC		Detail description	Claystone	

Group Name : DICT - User Defined Groups and Headings					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**DICT_TYPE**		Flag to indicate Group or Heading definition	HEADING	***New***
*	**DICT_GRP**		Group Name	ISPT	***New***
*	**DICT_HDNG**		Heading Name	ISPT_CALN	***New***
	DICT_STAT		Heading status KEY or COMMON (blank for Group)	COMMON	***New***
	DICT_DESC		Description	Corrected N value	***New***
	DICT_UNIT		Units		***New***
	DICT_EXMP		Example	20	***New***

Group Name : DISC - Discontinuity Data					***New***
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***New***
*	**DISC_TOP**	m	Depth to top in hole, or distance to start on traverse, of discontinuity zone, or discontinuity	10.26	***New***
*	**DISC_BASE**	m	Depth to base in hole, or distance to end on traverse, of discontinuity zone	12.67	***New***
*	**FRAC_SET**		Discontinuity set reference number	J3	***New***
*	**DISC_NUMB**		Discontinuity number	57	***New***
	DISC_TYPE		Type of discontinuity	Joint	***New***
	DISC_DIP	deg	Dip of discontinuity	08	***New***
	DISC_DIR	deg	Dip direction of discontinuity	247	***New***
	DISC_RGH		Small scale roughness (ISRM 1978)	Smooth	***New***
	DISC_PLAN		Intermediate scale planarity (ISRM 1978)	Planar	***New***
	DISC_WAVE	m	Large scale waviness, wavelength (ISRM 1978)	15	***New***
	DISC_AMP	m	Large scale waviness, amplitude (ISRM 1978)	0.5	***New***
	DISC_JRC		Joint Roughness Coefficient	10	***New***
	DISC_APP		Surface appearance	Slightly polished	***New***
	DISC_APT	mm	Discontinuity aperture measurement	2	***New***
	DISC_APOB		Discontinuity aperture observation	Infilled	***New***
	DISC_INFM		Infilling material	Soft clay	***New***
	DISC_TERM		Discontinuity termination (lower, upper) (ISRM 1978)	XR (See Appendix 1)	***New***
	DISC_PERS	m	Persistence measurement	10.5	***New***
	DISC_STR	MPa	Discontinuity wall strength	50	***New***
	DISC_WETH		Discontinuity wall weathering	Slightly weathered	***New***
	DISC_SEEP		Seepage rating (ISRM 1978)	VI	***New***
	DISC_FLOW	l/min	Water flow estimate	2	***New***
	DISC_REM		Remarks		***New***
	FILE_FSET		Associated File Reference	FS24	***New***

Group Name : DPRB - Dynamic Probe Test					
NB. The type of probe should be recorded in the Group DPRG					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6451/A	***Rev***
*	**DPRB_DPTH**	m	Depth to start of dynamic probe increment	2.50	
	~~**DPRB_TYPE**~~		~~Dynamic probe type~~	~~Macintosh~~	***Del***
	DPRB_BLOW		Dynamic probe blows for increment DPRB_INC	7	
	DPRB_TORQ	Nm	Maximum torque required to rotate rods	75	***New***
	DPRB_DEL	hhmm	Duration of delay before increment started	0	***New***
	DPRB_INC	mm	Dynamic probe increment	100	
	DPRB_REM		Notes on events during increment		***Rev***

Group Name : DPRG - Dynamic Probe Test - General					***New***
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6451/A	***New***
	DPRG_TYPE		Dynamic probe type	DPH	***New***
	DPRG_TEST		Test method	BS 1377 Part 9: 3.2	***New***
	DPRG_MASS	kg	Hammer mass	50	***New***
	DPRG_DROP	mm	Standard drop	500	***New***
	DRPG_CONE	mm	Cone base diameter	43	***New***
	DPRG_ROD	mm	Rod diameter	35	***New***
	DPRG_DAMP		Type of anvil damper	None	***New***
	DPRG_TIP	m	Depth of cone if left in ground	8.00	***New***
	DPRG_REM		General remarks	Hole backfilled on completion	***New***
	FILE_FSET		Associated File Reference	FS25	***New***

Group Name : DREM - Depth Related Remarks					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***Rev***
*	**DREM_DPTH**	m	Depth of DREM_REM	12.50	
	DREM_REM		Depth related remark	Driving boulder ahead of casing from 12.50 to 13.80	

Group Name : FILE - Associated Files					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**FILE_FSET**		File set reference number	FS128	***New***
*	**FILE_NAME**		File name	BH1COR08.JPG	***New***
	FILE_DESC		Description of content	BH1 Core photo box 8	***New***
	FILE_TYPE		File type	JPG	***New***
	FILE_PROG		Parent program and version number	Paintshop Pro v 5.0	***New***
	FILE_DATE	dd/mm/yyyy	File date	31/07/1999	***New***

Group Name : FLSH - Rotary Core Flush Details					***New***
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***New***
*	**FLSH_FROM**	m	Depth to top of flush zone	10.00	***New***
*	**FLSH_TO**	m	Depth to bottom of flush zone	20.00	***New***
	FLSH_TYPE		Type of flush	Water	***New***
	FLSH_RETN	%	Flush return	50	***New***
	FLSH_COL		Colour of flush return	White	***New***

Group Name : FRAC - Fracture Spacing					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6423/A	***Rev***
*	**FRAC_TOP**	m	Depth to top in hole, or distance to start on traverse, of the zone	31.20	***Rev***
*	**FRAC_BASE**	m	Depth to base in hole, or distance to end on traverse, of the zone	33.65	***Rev***
*	**FRAC_SET**		Discontinuity set reference number	J3	***New***
	FRAC_FI		Fracture Index over zone (fractures per metre)	15	***Rev***
	FRAC_IMAX	mm	Maximum Fracture Spacing over zone	350	***Rev***
	FRAC_IAVE	mm	Average Fracture Spacing over zone	220	***Rev***
	FRAC_IMIN	mm	Minimum Fracture Spacing over zone	NI	***Rev***
	FILE_FSET		Associated file reference	FS4	***New***

Group Name : FRST - Frost Susceptibility					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6341/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	11	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen depth	6.50	
	FRST_COND		Sample condition	Undisturbed	***Rev***
	FRST_REM		Notes on frost susceptibility testing as per TRRL SR 829		
	FRST_DDEN	Mg/m3	Dry density	1.96	
	FRST_MC	%	Moisture content	24	
	FRST_HVE1	%	Frost heave, first specimen	3.0	
	FRST_HVE2	%	Frost heave, second specimen	4.5	
	FRST_HVE3	%	Frost heave, third specimen	3.5	
	FRST_HVE	%	Mean heave of 3 specimens	3.67	
	FILE_FSET		Associated file reference	FS20	***New***

Group Name : GAST - Gas Constituents

N.B. **Provision for reporting of this data is included in group CNMT, group CNMT should be used in preference. Group GAST will be deleted from future editions.**

Status	Heading	Unit	Description	Example	
*	~~HOLE_ID~~		~~Exploratory hole or traverse name/number~~	~~6151/A~~	~~Del~~
*	~~SAMP_TOP~~	~~m~~	~~Depth to TOP of test sample~~	~~6.50~~	~~Del~~
*	~~SAMP_REF~~		~~Sample reference number~~	~~6~~	~~Del~~
*	~~SAMP_TYPE~~		~~Sample type~~	~~G (See Appendix 1)~~	~~Del~~
*	~~SPEC_REF~~		~~Specimen reference number~~	~~ii)~~	~~Del~~
*	~~SPEC_DPTH~~	~~m~~	~~Specimen Depth~~	~~8.50~~	~~Del~~
*	~~GAST_DATE~~	~~dd/mm/yyyy~~	~~Date of sampling~~	~~26/03/1991~~	~~Del~~
*	~~GAST_TIME~~	~~hhmmss~~	~~Time of sampling~~	~~092800~~	~~Del~~
	~~GAST_REM~~		~~Remarks~~		~~Del~~
	~~GAST_TEMP~~	~~DegC~~	~~Temperature of gas at time of sampling~~	~~8~~	~~Del~~
	~~GAST_OX~~	~~% vol~~	~~Oxygen~~	~~0.16~~	~~Del~~
	~~GAST_NIT~~	~~% vol~~	~~Nitrogen~~	~~2.4~~	~~Del~~
	~~GAST_CARD~~	~~% vol~~	~~Carbon Dioxide~~	~~33.6~~	~~Del~~
	~~GAST_METH~~	~~% vol~~	~~Methane~~	~~63.8~~	~~Del~~
	~~GAST_HYDS~~	~~% vol~~	~~Hydrogen Sulphide~~	~~0.00002~~	~~Del~~
	~~GAST_ETHA~~	~~% vol~~	~~Ethane~~	~~0.005~~	~~Del~~
	~~GAST_PROP~~	~~% vol~~	~~Propane~~	~~0.002~~	~~Del~~
	~~GAST_HYD~~	~~% vol~~	~~Hydrogen~~	~~0.05~~	~~Del~~
	~~GAST_HEL~~	~~% vol~~	~~Helium~~	~~0.0000005~~	~~Del~~
	~~GAST_HIGA~~	~~% vol~~	~~Higher Alkanes~~	~~0.1~~	~~Del~~
	~~GAST_CARM~~	~~% vol~~	~~Carbon Monoxide~~	~~0.001~~	~~Del~~
	~~GAST_ETHE~~	~~% vol~~	~~Ethene~~	~~0.018~~	~~Del~~
	~~GAST_ACET~~	~~% vol~~	~~Acetaldehyde~~	~~0.005~~	~~Del~~
	~~GAST_ISOB~~	~~% vol~~	~~Isobutane~~	~~0.002~~	~~Del~~
	~~GAST_NBUT~~	~~% vol~~	~~n - butane~~	~~0.001~~	~~Del~~
	~~GAST_SATH~~	~~% vol~~	~~Saturated Hydrocarbons other than Methane, Ethane, Propane, Butane~~	~~0.005~~	~~Del~~
	~~GAST_UNSH~~	~~% vol~~	~~Unsaturated Hydrocarbons other than Ethene~~	~~0.009~~	~~Del~~
	~~GAST_HALO~~	~~% vol~~	~~Halogenated Compounds~~	~~0.00002~~	~~Del~~
	~~GAST_ORGS~~	~~% vol~~	~~Organosulphur Compounds~~	~~0.00001~~	~~Del~~
	~~GAST_ALCO~~	~~% vol~~	~~Alcohols~~	~~0.00001~~	~~Del~~
	~~GAST_HYDC~~	~~% vol~~	~~Hydrogen Cyanide~~	~~0.00001~~	~~Del~~
	~~GAST_DIES~~	~~% vol~~	~~Diethyl Sulphide~~	~~0.0000005~~	~~Del~~
	~~GAST_RAD~~	~~Bq/m3~~	~~Radon~~	~~200~~	~~Del~~
	~~GAST_OTHR~~	~~% vol~~	~~Other Types~~	~~0.023~~	~~Del~~
	~~GAST_OTH~~		~~Definition of GAST_OTHR~~		~~Del~~

Group Name : GEOL - Stratum Descriptions					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**GEOL_TOP**	m	Depth to the TOP of stratum	16.21	
*	**GEOL_BASE**	m	Depth to the BASE of description	17.25	
	GEOL_DESC		General description of stratum	Stiff grey silty CLAY	
	GEOL_LEG		Legend code	4A (See Rule 20)	***Rev***
	GEOL_GEOL		Geology code	LC (See Rule 20)	***Rev***
	GEOL_GEO2		Second Geology code	SAND (See Rule 20)	***New***
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***Rev***
	FILE_FSET		Associated file reference	FS4	***New***

Group Name : GRAD - Particle Size Distribution Analysis Data					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.60	
*	**GRAD_SIZE**	mm	Sieve or particle size	3.35	
	GRAD_PERP	%	Percentage passing/finer	25	
	GRAD_TYPE		Grading analysis test type	WS (See Appendix 1)	***Rev***

Group Name : HDIA - Hole Diameter by Depth **NB. Casing information should now be recorded in the CDIA group**					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***Rev***
*	**HDIA_HDEP**	m	Depth achieved at HDIA_HOLE	18.0	
	HDIA_HOLE	mm	Borehole diameter	200	
	~~**HDIA_CASG**~~	~~mm~~	~~Casing diameter~~ *(included for backward compatibility only)*	~~200~~	***Del***
	~~**HDIA_CDEP**~~	~~m~~	~~Depth to which HDIA_CASG taken~~ *(included for backward compatibility only)*	~~18.0~~	***Del***

Group Name : HOLE - Hole Information					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	327/16A	***Rev***
	HOLE_TYPE		Type of exploratory hole	CP (See Appendix 1)	***Rev***
	HOLE_NATE	m	National Grid Easting of hole or start of traverse	523145	***Rev***
	HOLE_NATN	m	National Grid Northing of hole or start of traverse	178456	***Rev***
	HOLE_GL	m	Ground level relative to Datum of hole or start of traverse	16.23	***Rev***
	HOLE_FDEP	m	Final depth of hole	32.60	
	HOLE_STAR	dd/mm/yyyy	Date of start of excavation	18/03/1991	
	HOLE_LOG		The definitive person responsible for logging the hole	DPG	
	HOLE_REM		General remarks on hole	Abandoned on engineer's instruction	***Rev***
	HOLE_ETRV	m	National Grid Easting of end of traverse	523195	***New***
	HOLE_NTRV	m	National Grid Northing of end of traverse	178486	***New***
	HOLE_LTRV	m	Ground level relative to datum of end of traverse	9.67	***New***
	HOLE_LETT		Ordnance Survey letter grid reference	TQ 123 456	
	HOLE_LOCX	m	Local grid x co-ordinate	565	
	HOLE_LOCY	m	Local grid y co-ordinate	421	
	HOLE_LOCZ	m	Level to local datum	+106.6	
	HOLE_ENDD	dd/mm/yyyy	Hole end date	22/03/1991	
	HOLE_BACD	dd/mm/yyyy	Hole backfill date	22/03/1991	
	HOLE_CREW		Name of driller	A.B. Driller	
	HOLE_ORNT	deg	Orientation of hole or traverse (degrees from north)	010	***Rev***
	HOLE_INCL	deg	Inclination of hole or traverse (measured positively down from horizontal)	65	***Rev***
	HOLE_EXC		Plant used	JCB - 3CX	***Rev***
	HOLE_SHOR		Shoring/support used	None	
	HOLE_STAB		Stability	Stable during excavation	
	HOLE_DIML	m	Trial pit or logged traverse length	27.56	***Rev***
	HOLE_DIMW	m	Trial pit or logged traverse width	1.35	***Rev***
	HOLE_LOCM		Method of location	dGPS	***New***
	HOLE_LOCA		Location sub division within project	SubStation 1	***New***
	HOLE_CLST		Hole cluster reference number	CLST01	***New***
	FILE_FSET		Associated file reference	FS2	***New***

Group Name : HPGI - Horizontal Profile Gauge Installation Details					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6423/A	***Rev***
*	**HPGI_ID**		Instrument reference number	H2345	
	HPGI_DATE	dd/mm/yyyy	Installation date	22/03/1994	
	HPGI_DLN	m	Level of datum point relative to HOLE_GL or HOLE_LOCZ	0.30	***Rev***
	HPGI_FDIS	m	Distance to furthest reference point from datum point	20	
	HPGI_NDS	m	Distance to nearest reference point from datum point	2.00	
	HPGI_DIRH	deg	Direction of HPG from datum point (degrees from north)	142	
	HPGI_REM		Remarks, details of instrument		
	FILE_FSET		Associated file reference	FS14	***New***

Group Name : HPGO - Horizontal Profile Gauge Observations					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6423/A	***Rev***
*	**HPGI_ID**		Instrument reference number	H2345	
*	**HPGO_DATE**	dd/mm/yyyy	Date of reading	26/03/1994	
*	**HPGO_TIME**	hhmmss	Time of reading	164000	
*	**HPGO_DIS**	m	Distance from datum point to reading point	15.05	***Rev***
	HPGO_RLEV	m	Level of reading point relative to datum point	0.73	
	HPGO_REM		Remarks	Embankment at 2.00m	

Group Name : ICBR - In Situ CBR Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A or CBR 6	***Rev***
*	**ICBR_DPTH**	m	Depth to top of CBR test	0.50	
	ICBR_REM		Details of apparatus and surcharge	10kg surcharge	
	ICBR_ICBR	%	CBR value	1.2	
	ICBR_MC	%	Moisture content relating to test	25	
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***New***

Group Name : IDEN - In Situ Density Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6461/A or DEN 7	***Rev***
*	**IDEN_DPTH**	m	Depth of in situ density test	1.25	
	IDEN_REM		Details of in situ density test	Nuclear probe	
	IDEN_IDEN	Mg/m3	In situ bulk density	1.86	
	IDEN_MC	%	Moisture content relating to in situ test	18	
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***New***

Group Name : INST - Single Point Instrument Installation Details **NB. Piezometer installations should be recorded in Group PREF**					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***Rev***
*	**INST_TDEP**	m	Depth to reference level of instrument from HOLE_GL or HOLE_LOCZ	7.25	***Rev***
*	**INST_ID**		Instrument reference number	A2345	
	INST_TYPE		Instrument type	ESET (See Appendix 1)	***Rev***
	INST_DATE	dd/mm/yyyy	Instrument installation date	22/03/1994	
	~~**INST_TRPS**~~	~~m~~	~~Depth to top of response zone from HOLE_GL or HOLE_LOCZ~~	~~6.50~~	***Del***
	~~**INST_BRPS**~~	~~m~~	~~Depth to base of response zone from HOLE_GL or HOLE_LOCZ~~	~~7.50~~	***Del***
	INST_DIP	deg	Inclination of instrument (measured positively down from horizontal)	90	
	INST_DIR	deg	Direction of INST_DIP (degrees from north)	270	
	INST_INTZ	kN/m2	Pressure reading at zero applied pressure	15	
	INST_REM		Remarks		
	FILE_FSET		Associated file reference	FS13	***New***

Group Name : IOBS - Single Point Instrument Readings

NB. Piezometer readings should be recorded in Group POBS

Status	Heading	Unit	Description	Example	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**INST_TDEP**	m	Depth to reference level of instrument from HOLE_GL or HOLE_LOCZ	7.25	***Rev***
*	**INST_ID**		Instrument reference number	A2345	
*	**IOBS_DATE**	dd/mm/yyyy	Date of reading	26/03/1994	
*	**IOBS_TIME**	hhmmss	Time of reading	164000	
	~~**IOBS_DEP**~~	~~m~~	~~Depth to water from HOLE_GL or HOLE_LOCZ~~	~~2.25~~	***Del***
	~~**IOBS_HEAD**~~	~~m~~	~~Head of water above INST_DEP~~	~~5.00~~	***Del***
	IOBS_PRES	kN/m2	Reading of pressure	80	
	IOBS_LEVL	m	Level of settlement point relative to datum	11.56	
	IOBS_REM		Remarks	Reading taken during heavy rain	

Group Name : IPRM - In Situ Permeability Test

Status	Heading	Unit	Description	Example	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6471/A	***Rev***
*	**IPRM_TOP**	m	Depth to top of test zone	12.20	***Rev***
*	**IPRM_BASE**	m	Depth to base of test zone	12.95	
*	**IPRM_STG**		Stage number of multistage packer test	1	***Rev***
	IPRM_TYPE		Type of test	Rising, Falling, Constant Head	
	IPRM_PRWL	m	Depth to water in borehole or piezometer immediately prior to test	10.60	
	IPRM_SWAL	m	Depth to water at start of test	5.40	
	IPRM_TDIA	m	Diameter of test zone	0.150	
	IPRM_SDIA	m	Diameter of standpipe or casing	0.019	
	IPRM_IPRM	m/s	Permeability	5E-9	***Rev***
	IPRM_REM		Test remarks		
	IPRM_FLOW	l/s	Average flow during packer test stage	2.3	
	IPRM_AWL	m	Depth to assumed standing water level	10.0	
	IPRM_HEAD	m	Applied total head of water during test stage at centre of packer test zone	20.5	
	FILE_FSET		Associated File Reference	FS26	***New***

Group Name : IRDX - In Situ Redox Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A or RDX 2	***Rev***
*	**IRDX_DPTH**	m	Depth of redox test	1.0	
	IRDX_REM		Details of redox test and probe type		
	IRDX_PH		pH	7.0	
	IRDX_IRDX	mV	Redox potential	400	
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***New***

Group Name : IRES - In Situ Resistivity Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A or RES/12	***Rev***
*	**IRES_DPTH**	m	Depth range to which in situ resistivity test relates	0 to 10	
	IRES_TYPE		Type of resistivity test		
	IRES_IRES	ohmcm	Result	2000	
	IRES_REM		Details of test e.g. electrode spacing and configuration		
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***New***

Group Name : ISPT - Standard Penetration Test Results					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**ISPT_TOP**	m	Depth to top of test	13.50	
	ISPT_SEAT		Number of blows for seating drive	14	
	ISPT_MAIN		Number of blows for main test drive	35	
	ISPT_NPEN	mm	Total penetration for test	450	
	ISPT_NVAL		SPT 'N' value	35	
	ISPT_REP		SPT reported result	6,8/8,9,9,9 N=35	***New***
	ISPT_CAS	m	Casing depth at time of test	12.00	
	ISPT_WAT	m	Depth to water at time of test	2.50	
	ISPT_TYPE		Type of SPT test	S (See Appendix 1)	***Rev***
	ISPT_REM		Remarks relating to the test		
	ISPT_INC1		Number of blows for 1st Increment (Seating)	6	***Rev***
	ISPT_INC2		Number of blows for 2nd Increment (Seating)	8	***Rev***
	ISPT_INC3		Number of blows for 1st Increment (Test)	8	***Rev***
	ISPT_INC4		Number of blows for 2nd Increment (Test)	9	***Rev***
	ISPT_INC5		Number of blows for 3rd Increment (Test)	9	***Rev***
	ISPT_INC6		Number of blows for 4th Increment (Test)	9	***Rev***
	ISPT_PEN1	mm	Penetration for 1st Increment (Seating Drive)	75	***Rev***
	ISPT_PEN2	mm	Penetration for 2nd Increment (Seating Drive)	75	***Rev***
	ISPT_PEN3	mm	Penetration for 1st Increment (Test)	75	***Rev***
	ISPT_PEN4	mm	Penetration for 2nd Increment (Test)	75	***Rev***
	ISPT_PEN5	mm	Penetration for 3rd Increment (Test)	75	***Rev***
	ISPT_PEN6	mm	Penetration for 4th Increment (Test)	75	***Rev***

Group Name : IVAN - In Situ Vane Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A or VAN 15	***Rev***
*	**IVAN_DPTH**	m	Depth of vane test	13.50	
*	**IVAN_TESN**		Vane test number	1	***New***
	IVAN_REM		Details of vane test, vane size, vane type		
	IVAN_IVAN	kN/m2	Vane test result	60	
	IVAN_IVAR	kN/m2	Vane test remoulded result	45	
	IVAN_IPEN	kN/m2	Hand penetrometer result	23	***New***
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***New***

Group Name : MCVG - MCV Test - General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6481/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	18	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
	MCVG_REM		Notes on MCV test as BS 1377 Part 4 Cl. 5.4, and 5.5. Test report items a) and c)		
	MCVG_2ØØ	%	Weight percent of material retained on 20mm sieve	15	
	MCVG_NMC	%	Natural moisture content	21	
	MCVG_PRCL		MCV precalibrated value as BS 1377 Part 4 and whether higher or lower.	>10	
	FILE_FSET		Associated file reference	FS15	***New***

Group Name : MCVT - MCV Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6481/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	18	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
*	**MCVT_TESN**		MCV test number	1	
	MCVT_MC	%	Moisture content	17	
	MCVT_RELK		MCV value at MCVT_MC moisture content	12.3	
	MCVT_BDEN	Mg/m3	Bulk density related to the MCVT_RELK MCV	2.0	

Group Name : POBS - Piezometer Readings					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**PREF_TDEP**	m	Depth to reference level of piezometer tip	7.25	
*	**POBS_DATE**	dd/mm/yyyy	Date of piezometer reading	26/03/1991	
*	**POBS_TIME**	hhmmss	Time of piezometer reading	164000	
	POBS_DEP	m	Depth to water below ground surface	6.40	
	POBS_HEAD	m	Head of water above piezometer tip	0.85	
	POBS_REM		Remarks	Reading taken during heavy rain	

Group Name : PREF - Piezometer Installation Details					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**PREF_TDEP**	m	Depth to reference level of piezometer tip	7.25	
	PREF_DATE	dd/mm/yyyy	Piezometer installation date	22/03/1991	
	PREF_TYPE		Piezometer type	PPIE (See Appendix 1)	***Rev***
	PREF_TRPS	m	Depth to top of response zone	6.50	
	PREF_BRPS	m	Depth to base of response zone	7.50	
	PREF_REM		Details of type and depths of grouting and readout arrangements/locations		
	FILE_FSET		Associated file reference	FS6	***New***

Group Name : PROB - Profiling Instrument Readings					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6422/A	***Rev***
*	**PROF_ID**		Instrument reference number	B2345	
*	**PROB_DATE**	dd/mm/yyyy	Date of reading	26/03/1994	
*	**PROB_TIME**	hhmmss	Time of reading	164000	
*	**PROB_DEP**	m	Depth of reading from HOLE_GL or HOLE_LOCZ	6.50	***Rev***
	PROB_GAUG		Rod or inclinometer gauge length	0.50	
	PROB_TDEP	m	Depth to top of slip obstruction from HOLE_GL or HOLE_LOCZ for slip indicator	3.20	***Rev***
	PROB_BDEP	m	Depth to base of slip obstruction from HOLE_GL or HOLE_LOCZ for slip indicator	4.00	***Rev***
	PROB_A	mm	Primary keyway displacement direction A	3	
	PROB_B	mm	Displacement direction B	-3	
	PROB_C	mm	Displacement direction C	2	
	PROB_D	mm	Displacement direction D	-2	
	PROB_REM		Details for instrument reference, probe logger, serial numbers		

Group Name : PROF - Profiling Instrument Installation Details					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6422/A	***Rev***
*	**PROF_ID**		Instrument reference number	B2345	
	PROF_DATE	dd/mm/yyyy	Installation date	22/03/1994	
	PROF_TYPE		Profiling instrument type	INCL (See Appendix 1)	***Rev***
	PROF_TRPS	m	Depth to top of response zone from HOLE_GL or HOLE_LOCZ	0.00	***Rev***
	PROF_BRPS	m	Depth to base of response zone from HOLE_GL or HOLE_LOCZ	7.50	***Rev***
	PROF_DIRA	deg	Orientation of primary keyway (degrees from north)	120	
	PROF_REM		Remarks	Primary keyway (A) orientated downslope, secondary direction (C) across slope to left looking down	
	FILE_FSET		Associated File Reference	FS27	***New***

Group Name : PRTD - Pressuremeter Test Data					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**PRTD_TREF**		Reference number of test	1	
*	**PRTD_DPTH**	m	Depth of test	2.70	
*	**PRTD_SEQ**		Sequence number	1	
	PRTD_DATE	dd/mm/yyyy	Date of test	22/12/1993	
	PRTD_TYPE		Pressuremeter type	SBP (See Appendix 1)	***Rev***
	PRTD_DIA	mm	Uninflated diameter of pressuremeter	82.9	
	PRTD_ARM1	mm	Arm (pair) 1 displacement	1.0	
	PRTD_ARM2	mm	Arm (pair) 2 displacement	1.0	
	PRTD_ARM3	mm	Arm (pair) 3 displacement	1.0	
	PRTD_TPC1	kN/m2	Total pressure/arm (pair) 1	54.40	
	PRTD_TPC2	kN/m2	Total pressure/arm (pair) 2	54.40	
	PRTD_TPC3	kN/m2	Total pressure/arm (pair) 3	54.40	
	PRTD_PPA	kN/m2	Pore pressure cell A	2.90	
	PRTD_PPB	kN/m2	Pore pressure cell B	2.90	
	PRTD_REM		Remarks		
	PRTD_PRES	kN/m2	Total pressure in test cell	60.1	***New***
	PRTD_VOL	cm3	Volume change in test cell	2.6	***New***

Group Name : PRTG - Pressuremeter Test Results, General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**PRTD_TREF**		Reference number of test	1	
*	**PRTD_DPTH**	m	Depth of test	2.70	
	PRTD_DATE	dd/mm/yyyy	Date of test	22/12/1993	
	PRTD_TYPE		Pressuremeter type	SBP (See Appendix 1)	***Rev***
	PRTD_DIA	mm	Uninflated diameter of pressuremeter	82.9	
	PRTG_HA1	kN/m2	Estimated horizontal stress, arm (pair) 1	700	
	PRTG_HA2	kN/m2	Estimated horizontal stress, arm (pair) 2	700	
	PRTG_HA3	kN/m2	Estimated horizontal stress, arm (pair) 3	700	
	PRTG_HAA	kN/m2	Estimated horizontal stress, average	700	
	PRTG_GIA1	MN/m2	Initial shear modulus, arm (pair) 1	70	
	PRTG_GIA2	MN/m2	Initial shear modulus, arm (pair) 2	70	
	PRTG_GIA3	MN/m2	Initial shear modulus, arm (pair) 3	70	
	PRTG_GIAA	MN/m2	Initial shear modulus, average	70	
	PRTG_CUA1	kN/m2	Undrained shear strength, arm (pair) 1	420	***Rev***
	PRTG_CUA2	kN/m2	Undrained shear strength, arm (pair) 2	420	***Rev***
	PRTG_CUA3	kN/m2	Undrained shear strength, arm (pair) 3	420	***Rev***
	PRTG_CUAA	kN/m2	Undrained shear strength, average	420	***Rev***
	PRTG_PLA1	kN/m2	Limit pressure, arm (pair) 1	3400	***Rev***
	PRTG_PLA2	kN/m2	Limit pressure, arm (pair) 2	3400	***Rev***
	PRTG_PLA3	kN/m2	Limit pressure, arm (pair) 3	3400	***Rev***
	PRTG_PLAA	kN/m2	Limit pressure, average	3400	***Rev***
	PRTG_AFA1	deg	Angle of friction, arm (pair) 1	39	
	PRTG_AFA2	deg	Angle of friction, arm (pair) 2	39	
	PRTG_AFA3	deg	Angle of friction, arm (pair) 3	39	
	PRTG_AFAA	deg	Angle of friction, average	39	
	PRTG_ADA1	deg	Angle of dilation, arm (pair) 1	10	
	PRTG_ADA2	deg	Angle of dilation, arm (pair) 2	10	
	PRTG_ADA3	deg	Angle of dilation, arm (pair) 3	10	
	PRTG_ADAA	deg	Angle of dilation, average	10	
	PRTG_AFCV	deg	Angle of friction at constant volume (ϕ_{cv}) used	35	
	PRTG_REM		Remarks		
	FILE_FSET		Associated file reference	FS11	***New***

Group Name : PRTL - Pressuremeter Test Results, Individual Loops					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**PRTD_TREF**		Reference number of test	1	
*	**PRTD_DPTH**	m	Depth of test	2.70	
*	**PRTL_LNO**		Unload/Reload loop number	1	
	PRTD_DATE	dd/mm/yyyy	Date of test	22/12/1993	
	PRTD_TYPE		Pressuremeter type	SBP (See Appendix 1)	***Rev***
	PRTD_DIA	mm	Uninflated diameter of pressuremeter	82.9	
	PRTL_GA1	MN/m2	Unload/reload shear modulus, arm (pair) 1	70	
	PRTL_GA2	MN/m2	Unload/reload shear modulus, arm (pair) 2	70	
	PRTL_GA3	MN/m2	Unload/reload shear modulus, arm (pair) 3	70	
	PRTL_GAA	MN/m2	Unload/reload shear modulus, average	70	

Group Name : PTIM - Hole Progress by Time					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**PTIM_DATE**	dd/mm/yyyy	Date of progress reading	20/03/1991	
*	**PTIM_TIME**	hhmm	Time of progress reading	1435	
	PTIM_DEP	m	Hole depth at PTIM_TIME	22.13	
	PTIM_CAS	m	Depth of casing at PTIM_TIME	20.50	
	PTIM_WAT	m	Depth to water at PTIM_TIME	16.56	
	PTIM_REM		Remarks at PTIM_TIME	Stopped drilling on client's instruction	

Group Name : PTST - Laboratory Permeability Tests					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6411/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
*	**PTST_TESN**		Permeability test number	2	
	PTST_REM		Permeability test method	Constant head permeability test	
	PTST_COND		Sample condition	Undisturbed	
	PTST_SZUN	mm	Size cut off of material too coarse for testing	5	
	PTST_UNS	%	Proportion of material too coarse for testing - BS 1377 Part 5 cl 5.7	36	
	PTST_DIA	mm	Diameter of test sample	102	
	PTST_LEN	mm	Length of test sample	200	
	PTST_MC	%	Initial moisture content of test sample	20	
	PTST_BDEN	Mg/m3	Initial bulk density of test sample	2.24	
	PTST_DDEN	Mg/m3	Dry density of test sample	1.87	
	PTST_VOID		Voids ratio of test sample	0.37	
	PTST_K	m/s	Coefficient of permeability	4E-6	***Rev***
	PTST_TSTR	kN/m2	Mean effective stress at which permeability measured (when measured in triaxial cell).	112	
	PTST_ISAT	%	Initial degree of saturation	72	
	PTST_FSAT	%	Final degree of saturation	98	
	PTST_PDEN		Particle density, measured or (#) assumed	2.65	
	FILE_FSET		Associated File Reference	FS28	***New***

Group Name : PUMP - Pumping Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**PUMP_DATE**	dd/mm/yyyy	Date of reading	16/03/1991	***Rev***
*	**PUMP_TIME**	hhmmss	Time of reading	143500	
	PUMP_DPTH	m	Depth to water below ground	12.5	
	PUMP_QUAT	l/s	Pumping rate from hole	0.8	
	PUMP_REM		Remarks	Double packer	
	FILE_FSET		Associated File Reference	FS29	***New***

Group Name: RELD - Relative Density Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	8.50	
*	**SAMP_REF**		Sample reference number	16	
*	**SAMP_TYPE**		Sample type	LB (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen depth	8.50	
	RELD_REM		Method of test		
	RELD_DMAX	Mg/m3	Maximum dry density as BS 1377 part 4 cl 4	2.15	
	RELD_375	%	Weight percent of sample retained on 37.5mm sieve	7.0	
	RELD_Ø63	%	Weight percent of sample retained on 6.3mm sieve	10	
	RELD_Ø2Ø	%	Weight percent of sample retained on 2mm sieve	5.0	
	RELD_DMIN	Mg/m3	Minimum dry density as BS 1377 part 4 cl 4	1.65	

Group Name : ROCK - Rock Testing					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6423/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	2.54	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	C (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen depth	2.54	
	ROCK_PLS	MN/m2	Uncorrected point load (I_s)	2.3	
	ROCK_PLSI	MN/m2	Size corrected point load index (I_s 50)	2.5	
	ROCK_PLTF		Point load test type (A, D, L or P)	A	
	ROCK_UCS	MN/m2	Uniaxial compressive strength (size corrected)	16.8	
	ROCK_REM		Remarks		
	ROCK_PREM		Details additional to ROCK_PLTF		
	ROCK_UREM		Notes on uniaxial compressive strength test, including sample dimensions	ISRM 76mm diameter 205mm high	***Rev***
	ROCK_E	MN/m2	Elastic modulus	220	
	ROCK_MU		Poisson's ratio	0.3	
	ROCK_BRAZ	MN/m2	Tensile strength by the Brazilian method	50	
	ROCK_BREM		Notes on Brazilian tensile strength test including sample dimensions	ISRM 76mm diameter 32mm thick	***Rev***
	ROCK_PORO	%	Rock porosity	17	
	ROCK_PORE		Notes on type of porosity test	ISRM Caliper method	***Rev***
	ROCK_MC	%	Natural moisture content	18	
	ROCK_BDEN	Mg/m3	Rock bulk density	2.22	***Rev***
	ROCK_DDEN	Mg/m3	Rock dry density	1.88	***Rev***

Group Name : ROCK - Rock Testing (continued)					
Status	**Heading**	**Unit**	**Description**	**Example**	
	ROCK_PDEN	Mg/m3	Aggregate particle density	2.53	***New***
	ROCK_DREM		Aggregate particle density test method and notes	BS812 Gas jar method. Saturated, surface dried10mm aggregate	***New***
	ROCK_WTAB	%	Aggregate water absorption	2.6	***New***
	ROCK_WREM		Aggregate water absorption test method and notes	BS812 Gas jar method 10mm aggregate	***New***
	ROCK_SDI	%	Slake durability Index	23.2	***Rev***
	ROCK_SREM		Slake durability test method and notes	ISRM 2nd cycle Tap water at 20 deg C	***Rev***
	ROCK_SOUN	%	Aggregate Soundness Test	95	***Rev***
	ROCK_MREM		Aggregate soundness test method and notes	BS 812 Magnesium sulphate 10-14mm aggregate 5 cycles % retained	***Rev***
	ROCK_ACV	%	Aggregate Crushing Value	16.5	***New***
	ROCK_CREM		Aggregate Crushing Value test method and notes	BS812 10-14mm aggregate	***New***
	ROCK_AIV	%	Aggregate Impact Value	15	***New***
	ROCK_IREM		Aggregate Impact Value test method and notes	BS812 10-14mm aggregate, saturated 15 blows	***New***
	ROCK_LOSA	%	Aggregate Los Angeles abrasion	15	***New***
	ROCK_LREM		Aggregate Los Angeles abrasion test method and notes	ASTM C131 9.5-19mm aggregate 500 revolutions	***New***
	ROCK_AAV		Aggregate Abrasion Value	8.32	***New***
	ROCK_PSV		Aggregate Polished Stone Value	67	***New***
	ROCK_FI	%	Aggregate Flakiness Index	9	***New***
	ROCK_EI	%	Aggregate Elongation Index	12	***New***
	ROCK_DESC		Specimen description	Mudstone	
	ROCK_SHOR		Shore hardness	29.7	
	ROCK_PWAV	m/s	P-wave velocity	3000	
	ROCK_SWAV	m/s	S-wave velocity	1800	
	ROCK_EMOD	GPa	Dynamic Elastic Modulus	20	***Rev***
	ROCK_SG	GPa	Shear modulus derived from ROCK_SWAV	8	***Rev***
	ROCK_SWEL	kN/m2	Rock swelling index	50	***New***
	FILE_FSET		Associated file reference	FS10	***New***

Group Name : SAMP - Sample Reference Information					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of sample	24.55	
*	**SAMP_REF**		Sample reference number	24	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
	SAMP_DIA	mm	Sample diameter	100	
	SAMP_BASE	m	Depth to BASE of sample	25.00	
	SAMP_DESC		Sample description	Stiff brown very silty CLAY	
	SAMP_UBLO		Number of blows required to drive sampler	35	
	SAMP_REM		Sample remarks	60% recovery	
	SAMP_DATE	dd/mm/yyyy	Date sample taken	26/03/1991	***New***
	SAMP_TIME	hhmmss	Time sample taken	092800	***New***
	SAMP_BAR	kPa	Barometric Pressure at time of sampling	99.1	***New***
	SAMP_WDEP	m	Depth to water below ground surface at time of sampling	4.50	***New***
	SAMP_TEMP	DegC	Sample temperature at time of sampling	8	***New***
	SAMP_PRES	kPa	Gas pressure (above barometric)	0.2	***New***
	SAMP_FLOW	l/min	Gas flow	0.2	***New***
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	***Rev***
	FILE_FSET		Associated file reference	FS3	***New***

Group Name : SHBG - Shear Box Testing - General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6331/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
	SHBG_TYPE		Test type e.g. small shear box, large shear box, ring shear	Small shear box	
	SHBG_REM		Test notes e.g. undisturbed, pre-existing shear, recompacted, rock joint, cut plane	Undisturbed	
	SHBG_PCOH	kN/m2	Peak cohesion intercept	5	
	SHBG_PHI	deg	Peak angle of friction	26.5	
	SHBG_RCOH	kN/m2	Residual cohesion intercept	1	
	SHBG_RPHI	deg	Residual angle of friction	13.0	
	FILE_FSET		Associated file reference	FS18	***New***

Group Name : SHBT - Shear Box Testing					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6331/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
*	**SHBT_TESN**		Shear box stage number	1	
	SHBT_MC	%	Specimen initial moisture content	20	
	SHBT_BDEN	Mg/m3	Bulk density	1.96	
	SHBT_DDEN	Mg/m3	Dry density	1.63	
	SHBT_NORM	kN/m2	Shear box normal stress	100	
	SHBT_DISP	mm/s	Displacement rate		
	SHBT_PEAK	kN/m2	Shear box peak shear stress	65.5	
	SHBT_RES	%	Shear box residual shear stress	47.2	
	SHBT_PDIS	mm	Displacement at peak shear strength	2.35	
	SHBT_RDIS	mm	Displacement at residual shear strength	12.41	
	SHBT_PDEN		Particle density. measured or, (#) assumed	2.65	
	SHBT_IVR		Initial voids ratio	0.5	
	SHBT_MCI	%	Initial moisture content	20	
	SHBT_MCF	%	Final moisture content	18	

Group Name : STCN - Static Cone Penetration Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6421/A	***Rev***
*	**STCN_DPTH**	m	Depth of result for static cone test	12.10	
	STCN_TYP		Cone test type	PC (See Appendix 1)	***Rev***
	STCN_REF		Cone identification reference	PQ47	
	~~**STCN_FORC**~~	~~kN~~	~~Axial force (Qc)~~		***Del***
	~~**STCN_FRIC**~~	~~kN~~	~~Frictional force on sleeve (Qs)~~		***Del***
	STCN_RES	MN/m2	Cone resistance	20	
	STCN_FRES	kN/m2	Local unit side friction resistance	1000	
	STCN_PWP1	kN/m2	Porewater pressure	15.0	
	STCN_PWP2	kN/m2	Second porewater pressure	15.0	
	STCN_PWP3	kN/m2	Third porewater pressure	15.0	
	STCN_CON	uS/cm	Conductivity	0.01	
	STCN_TEMP	DegC	Temperature	10	
	STCN_PH		pH reading	7.2	***New***
	STCN_SLP1	deg	Slope Indicator no. 1	4.1	***New***
	STCN_SLP2	deg	Slope Indicator no. 2	6.3	***New***
	STCN_REDX	mV	Redox potential reading	13.3	***New***
	STCN_FFD	%	Fluorescence intensity	96.3	***New***
	STCN_PMT	counts/s	Photo-multiplier tube reading	26	***New***
	STCN_PID	uV	Photo ionization detector reading	3650	***New***
	STCN_FID	uV	Flame ionization detector reading	151260	***New***
	FILE_FSET		Associated file reference	FS12	***New***

Group Name : SUCT - Suction Tests					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	1	
*	**SPEC_DPTH**	m	Specimen depth	6.60	
	SUCT_METH		Test method	Chandler	
	SUCT_VAL	kN/m2	Suction value	50	

Group Name : TNPC - Ten Per Cent Fines					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/number	6321/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	25	
*	**SAMP_TYPE**		Sample type	B (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	2	
*	**SPEC_DPTH**	m	Specimen Depth	6.50	
	TNPC_TESN		Ten per cent fines test number	1	
	TNPC_REM		Notes on testing as per BS 812		
	TNPC_DRY	kN	10% fines values on dry aggregate	70	***Rev***
	TNPC_WET	kN	10% fines value on wet aggregate	60	***Rev***
	FILE_FSET		Associated file reference	FS19	***New***

Group Name : TRIG - Triaxial Test - General					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	3	
*	**SPEC_DPTH**	m	Specimen depth	6.80	
	TRIG_TYPE		Test type	UU (See Appendix 1)	***Rev***
	TRIG_COND		Sample condition	Undisturbed	
	TRIG_REM		Test method, additional information, failure criteria.		
	TRIG_CU	kN/m2	Value of undrained shear strength	75	
	TRIG_COH	kN/m2	Cohesion intercept associated with TRIG_PHI	2	
	TRIG_PHI	deg	Angle of friction for effective shear strength triaxial test	32	
	FILE_FSET		Associated file reference	FS7	***New***

Group Name : TRIX - Triaxial Test					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6431/A	***Rev***
*	**SAMP_TOP**	m	Depth to TOP of test sample	6.50	
*	**SAMP_REF**		Sample reference number	12	
*	**SAMP_TYPE**		Sample type	U (See Appendix 1)	***Rev***
*	**SPEC_REF**		Specimen reference number	3	
*	**SPEC_DPTH**	m	Specimen depth	6.80	
*	**TRIX_TESN**		Triaxial test/stage number	1	
	TRIX_SDIA	mm	Specimen diameter	38	
	TRIX_MC	%	Specimen initial moisture content	15	
	TRIX_CELL	kN/m2	Total cell pressure	100	***Rev***
	TRIX_DEVF	kN/m2	Deviator stress at failure	360	***Rev***
	TRIX_SLEN	mm	Sample length	76	
	TRIX_BDEN	Mg/m3	Initial bulk density	2.12	
	TRIX_DDEN	Mg/m3	Initial dry density	1.84	
	TRIX_PWPF	kN/m2	Porewater pressure at failure	60	***Rev***
	TRIX_PWPI	kN/m2	Porewater pressure at start of shear stage	50	***Rev***
	TRIX_STRN	%	Strain at failure	9	
	TRIX_MODE		Mode of failure	Brittle, plastic	

Group Name : UNIT - Unit Codes					***New***
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**UNIT_UNIT**		Unit Used	ohmcm	***New***
	UNIT_DESC		Description	Ohm centimetres	***New***

Group Name : WETH - Weathering Grades					***New***
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***New***
*	**WETH_TOP**	m	Depth to TOP of weathering subdivision	3.50	***New***
*	**WETH_BASE**	m	Depth to BASE of weathering subdivision	3.95	***New***
	WETH_GRAD		Material weathering grade	IV	***New***
	WETH_REM		Remarks, weathering system used	Geoguide 3	***New***

Group Name : WSTK - Water Strike Details					
Status	**Heading**	**Unit**	**Description**	**Example**	
*	**HOLE_ID**		Exploratory hole or traverse name/ number	6421/A	***Rev***
*	**WSTK_DEP**	m	Depth to water strike	17.20	
*	**WSTK_NMIN**	min	Minutes after strike	20	***Rev***
	WSTK_CAS	m	Casing depth at time of water strike	15.70	
	WSTK_DATE	dd/mm/yyyy	Date of water strike	19/03/1991	
	WSTK_TIME	hhmm	Time of water strike	1640	
	WSTK_POST	m	Depth to water after WSTK_NMIN minutes	10.23	
	WSTK_FLOW		Flow rate remarks	Steady flow of water into hole	
	WSTK_SEAL	m	Depth at which water strike sealed by casing	19.10	

APPENDIX 1

Pick Lists

Groups ABBR, CODE and UNIT

Introduction

Codes or abbreviations are used in a number of the AGS Format Groups in order to ensure consistency in terminology and for brevity. This Appendix defines a series of 'pick' lists of the standard codes and abbreviations and the Group and Field in which each is to be used.

The CNMT Group is used for all chemical test results. The codes used in the CNMT_TYPE Field of the CNMT Group define the determinand tested. The standard codes are given in the CODE Group 'pick' list below. For all other Groups the standard abbreviations are given in the ABBR Group 'pick' list below.

Whilst these lists are extensive, they are not intended to be exhaustive and it may be necessary to use some additional codes on a specific project. Guidance on using additional codes is given in Appendix 6.

All the abbreviations and codes used in any Group within an AGS Format submission must be defined in the ABBR and CODE Groups included in the submission. This applies to both standard codes given in the following 'pick' lists, and user defined, project specific codes.

The units used to report test results must be stated in the <UNITS> line of each Group and for chemical testing must be given in the CNMT_UNIT field of the CNMT Group. The abbreviations to be used for standard units are given in the UNIT 'pick' list below. All units used in an AGS Format submission must be defined in a UNIT group. This applies to both standard units given in the following 'pick' list and user defined units.

Notes on 'Pick' List Codes

1) Combined abbreviations may be used as appropriate from the ABBR 'pick' list. e.g. IP+CP+RC
Combined codes must not be used from the CODE 'pick' list.

2) See Appendix 6, section 18 on the use of in-situ testing abbreviations.

3) See Appendix 6, section 11 on the use of amalgamated samples.

4) All abbreviations and codes used must be defined in the ABBR and CODE Groups as appropriate. See Appendix 6, Section 7 for guidelines.

Group Name : ABBR - Abbreviations 'Pick' List			New
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**	
CNMT_TTYP	GAS	Gas	*New*
CNMT_TTYP	LIQUID	Liquid	*New*
CNMT_TTYP	SOLID	Solid	*New*
CNMT_TTYP	SOLID_21WAT	Solid (2:1 Soil/Water extract)	*New*
CNMT_TTYP	SOLID_ACID	Solid (Acid extract)	*New*
CNMT_TTYP	SOLID_AVAIL	Solid (Available)	*New*
CNMT_TTYP	SOLID_DRY	Solid (Dry weight)	*New*
CNMT_TTYP	SOLID_EDTA	Solid (EDTA extract)	*New*
CNMT_TTYP	SOLID_FREE	Solid (Free)	*New*
CNMT_TTYP	SOLID_PRES	Solid (Presence of)	*New*
CNMT_TTYP	SOLID_TOT	Solid (Total)	*New*
CNMT_TTYP	SOLID_WAT	Solid (Water extract)	*New*
CNMT_TTYP	WATER	Water	*New*
CNMT_TTYP	WATER_ACIDHY	Water (Acid hydrolysable)	*New*
CNMT_TTYP	WATER_DISS	Water (Dissolved)	*New*
CNMT_TTYP	WATER_ELEM	Water (Elemental)	*New*
CNMT_TTYP	WATER_FREE	Water (Free)	*New*
CNMT_TTYP	WATER_ORG	Water (Organic)	*New*
CNMT_TTYP	WATER_PRES	Water (Presence of)	*New*
CNMT_TTYP	WATER_SOLRE	Water (Soluble reactive)	*New*
CNMT_TTYP	WATER_TOT	Water (Total)	*New*
DISC_TERM	D	Terminates against another discontinuity	*New*
DISC_TERM	R	Terminates within rock	*New*
DISC_TERM	X	Extends beyond exposure	*New*
GRAD_TYPE	DS	Dry sieve	
GRAD_TYPE	HY	Hydrometer	
GRAD_TYPE	PP	Pipette	
GRAD_TYPE	WS	Wet sieve	
HOLE_TYPE	CH	Slope surface protection stripping	*New*
HOLE_TYPE	CP	Cable percussion (shell and auger)	
HOLE_TYPE	DCP	Dynamic cone penetrometer	
HOLE_TYPE	DP	Dynamic probe sampling	
HOLE_TYPE	EXP	Logged exposure	*New*
HOLE_TYPE	GCOP	GCO probe	*New*
HOLE_TYPE	ICBR	In situ CBR test (see note 2)	
HOLE_TYPE	IDEN	In situ density test (see note 2)	
HOLE_TYPE	INST	Instrument	
HOLE_TYPE	IRDX	In situ redox test (see note 2)	
HOLE_TYPE	IRES	In situ resistivity (see note 2)	
HOLE_TYPE	IVAN	In situ penetration vane test (see note 2)	
HOLE_TYPE	IP	Inspection pit	
HOLE_TYPE	OP	Observation pit/trench	
HOLE_TYPE	RC	Rotary cored	
HOLE_TYPE	RCG	Rotary drilling in common ground	*New*
HOLE_TYPE	RO	Rotary open hole	
HOLE_TYPE	SCP	Static cone penetrometer	
HOLE_TYPE	TP	Trial pit/trench	
HOLE_TYPE	TRAV	Linear logging traverse or scanline survey	*New*
HOLE_TYPE	VC	Vibrocore	*New*
HOLE_TYPE	W	Wash boring	
INST_TYPE	EPCE	Embedment pressure cell - electronic	
INST_TYPE	EPCH	Embedment pressure cell - hydraulic	
INST_TYPE	EPCP	Embedment pressure cell - pneumatic	
INST_TYPE	ESET	Electronic settlement cell/gauges	
INST_TYPE	HSET	Hydraulic settlement cell/gauges	
INST_TYPE	IPCE	Interface pressure cell - electronic	

Group Name : ABBR - Abbreviations 'Pick' List			
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**	
INST_TYPE	IPCH	Interface pressure cell - hydraulic	
INST_TYPE	IPCP	Interface pressure cell - pneumatic	
INST_TYPE	MSET	Levelling point or plate	
INST_TYPE	PPCE	Push in pressure cell - electronic	
INST_TYPE	PPCH	Push in pressure cell - hydraulic	
INST_TYPE	PPCP	Push in pressure cell - pneumatic	
INST_TYPE	PSET	Pneumatic settlement cell/gauges	
INST_TYPE	XSET	Extensometer settlement point	
ISPT_TYPE	C	Cone	
ISPT_TYPE	S	Split spoon	
PREF_TYPE	SP	Standpipe	***New***
PREF_TYPE	SPIE	Standpipe piezometer	
PREF_TYPE	HPIE	Hydraulic piezometer	
PREF_TYPE	PPIE	Pneumatic piezometer	
PREF_TYPE	EPIE	Electronic piezometer	
PROF_TYPE	INCL	Inclinometer	
PROF_TYPE	SLIP	Slip indicator	
PRTD_TYPE	SBP	Self boring pressuremeter	***New***
PRTD_TYPE	HPD	High pressure dilatometer	***New***
PRTD_TYPE	WRSBP	Weak rock self boring pressuremeter	***New***
PRTD_TYPE	MPM	Menard type pressuremeter	***New***
PRTD_TYPE	PIP	Push-in pressuremeter	***New***
SAMP_TYPE	AMAL	Amalgamated sample (see note 3)	***New***
SAMP_TYPE	B	Bulk disturbed sample	
SAMP_TYPE	BLK	Block sample	
SAMP_TYPE	C	Core sample	
SAMP_TYPE	CBR	CBR mould sample	
SAMP_TYPE	D	Small disturbed sample	
SAMP_TYPE	G	Gas sample	
SAMP_TYPE	LB	Large bulk disturbed sample (for earthworks testing)	
SAMP_TYPE	M	Mazier type sample	***New***
SAMP_TYPE	P	Piston sample	
SAMP_TYPE	SPTLS	Standard penetration test liner sample	***New***
SAMP_TYPE	TW	Thin walled push in sample	
SAMP_TYPE	U	Undisturbed sample - open drive	
SAMP_TYPE	W	Water sample	
STCN_TYP	CC	Conductivity cone	***New***
STCN_TYP	EC	Electric cone	
STCN_TYP	FFD	Fuel fluorescence cone	***New***
STCN_TYP	MC	Mechanical cone	
STCN_TYP	PC	Piezo cone	
STCN_TYP	TC	Temperature cone	***New***
TRIG_TYPE	CD	Consolidated drained (single stage)	
TRIG_TYPE	CDM	Consolidated drained (multi-stage)	
TRIG_TYPE	CU	Consolidated undrained with pwp measurement (single stage)	
TRIG_TYPE	CUM	Consolidated undrained with pwp measurement (multi-stage)	
TRIG_TYPE	UU	Unconsolidated quick undrained (single stage)	
TRIG_TYPE	UUM	Unconsolidated quick undrained (multi-stage)	

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
Bacteriological		
ADSC	Aerobic dip slide colonies	***New***
ABC	Anaerobic bacteria count	***New***
ANTHS	Anthrax (Presence of)	
CPERF	C. Perfringens	***New***
COLO	Coliform organisms	***New***
PNEU	L Pneumophila bacterium	***New***
LEG	Legionella bacterium	***New***
TCOL	Thermotolerant Coliforms	***New***
TVC	Total viable count	***New***
ESCC	Escherichia Coli	***Rev***
FCOL	Faecal Coliforms	***Rev***
FSTP	Faecal Streptococci	***Rev***
GPS	Gram Positive Spore	***Rev***
SALM	Salmonellae excluding S typhi	
TCC	Total Coliform count	
TPC	Total plate count	
BTEX		
BENZ	Benzene	
ETHYL	Ethylbenzene	
MXYL	m & p - Xylene	***Rev***
OXYL	o - Xylene	
TOL	Toluene	
Chlorinated Hydocarbons		
11DEA	1,1 - Dichloroethane	
11DEE	1,1 - Dichloroethene	
111TCE	1,1,1 - Trichloroethane	
112TCE	1,1,2 - Trichloroethane	
1122TCE	1,1,2,2 - Tetrachloroethane	
12DB	1,2 - Dichlorobenzene	
12DEA	1,2 - Dichloroethane	
12DP	1,2 - Dichloropropane	
13DB	1,3 - Dichlorobenzene	
14DB	1,4 - Dichlorobenzene	
BROMO	Bromodichloromethane	
BROMF	Bromoform	
BROMM	Bromomethane	
CTET	Carbon tetrachloride	
DIBM	Dibromochloromethane	
DCHLB	Dichlorobenzene (Total)	***New***
DCFM	Dichlorodifluormethane	
~~MCHLO~~	~~Methylene chloride~~	***Del***
MCHLB	Monochlorobenzene (Total)	***New***
PCHLB	Pentachlorobenzene (Total)	***New***
4CB	Tetrachlorobenzene (Total)	***New***
TCE	Tetrachloroethane	
TETC	Tetrachloroethene	***New***
T12DE	Trans - 1,2 - Dichloroethene	
T13DP	Trans - 1,3 - Dichloropropene	

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
TCHLB	Trichlorobenzene (Total)	***New***
TRCE	Trichloroethene	
TCFE	Trichlorofluoromethane	
VCHL	Vinyl chloride	
CLHYS	Chlorinated hydrocarbons	
CBENZ	Chlorobenzene	
CETH	Chloroethane	
CFM	Chloroform	
CMN	Chloromethane	
C13DP	cis - 1,3 - Dichloropropane	
Gases		
GBUT	Butane	***New***
GCARD	Carbon dioxide	***New***
GCARM	Carbon monoxide	***New***
GDIES	Diethyl sulphide	***New***
GETHA	Ethane	***New***
GETHE	Ethene	***New***
GHEL	Helium	***New***
GHYD	Hydrogen	***New***
GHYDC	Hydrogen cyanide	***New***
GHYDS	Hydrogen sulphide	***New***
GMETH	Methane	***New***
GNIT	Nitrogen	***New***
GOX	Oxygen	***New***
GPROP	Propane	***New***
GSATH	Saturated hydrocarbons	***New***
Herbicides		
AMET	Ametryn	***New***
ATZ	Atrazine	***New***
PROM	Prometryn	***New***
PROPZ	Propazine	***New***
SIMZ	Simazine	***New***
SIMT	Simetryne	***New***
TERB	Terbutryn	***New***
TRIZ	Trietazine	***New***
Hydrocarbons		
DECA	Decane	
DOCS	Docosane	***New***
DOD	Dodecane	
DOTC	Dotriacontane	***New***
EICO	Eicosane	
HEPD	Heptadecane	
~~HEPTA~~	~~Heptane~~	***Del***
HEPTE	Heptene	***New***
HEXAC	Hexacosane	***New***
HEXD	Hexadecane	
HDTS	Hydrocarbons (Total)	
~~NOND~~	~~Nonadecane~~	***Del***
~~NONA~~	~~Nonane~~	***Del***

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
OCTC	Octacosane	***New***
OCTD	Octadecane	
~~OCTA~~	~~Octane~~	***Del***
~~PENTD~~	~~Pentadecane~~	***Del***
TETRC	Tetracosane	***New***
TETRD	Tetradecane	
TTC	Tetratriacontane	***New***
TCONT	Triacontane	***New***
~~TRID~~	~~Tridecane~~	***Del***
~~UND~~	~~Undecane~~	***Del***
Inorganics		
AIMS	Acid insoluble matter	
ACIDW	Acidity as Calcium carbonate	***New***
ACALW	Acidity/Alkalinity	***Rev***
AMMOW	Ammonia	***Rev***
AMMNS	Ammoniacal nitrogen	
ASB	Asbestos	***New***
~~ASBPS~~	~~Asbestos (Presence of)~~	***Del***
~~ASBCS~~	~~Asbestos fibre count~~	***Del***
BICS	Bicarbonate	
BROMW	Bromide	***New***
CACOS	Calcium carbonate	
CALOS	Calorific value	
COS	Carbonate	
CATIS	Cation exchange capacity	***Rev***
CL	Chloride	***Rev***
~~CHLOS~~	~~Chloride (percent of dry weight)~~	***Del***
COMBS	Combustibility	
CN	Cyanide	***New***
~~CNCS~~	~~Cyanide (Complex)~~	***Del***
~~CNFS~~	~~Cyanide (Free)~~	***Del***
~~CNTS~~	~~Cyanide (Total)~~	***Del***
~~ELCOS~~	~~Electrical conductivity at 20° C~~	***Del***
FERCS	Ferricyanide	
FERFS	Ferro-ferricyanide	
FLS	Fluoride	
IOW	Iodide	***New***
NITRS	Kjeldahl nitrogen (Total)	
IGNIS	Loss on ignition	***Rev***
MOIST	Moisture content	***New***
NIRS	Nitrate	
NIIS	Nitrite	
OMS	Organic matter	
ORTHS	Orthophosphate	
PHS	pH	
PHOS	Phosphate	
PHOTS	Phosphorous	***Rev***
SILS	Silica	***New***
STONE	Stone content	***New***

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
SULWS	Sulphate	***Rev***
~~SULTS~~	~~Sulphate (Total) (percent of dry weight)~~	***Del***
SULIS	Sulphide	
~~SULFS~~	~~Sulphide (Free)~~	***Del***
SULES	Sulphur	***Rev***
~~SUFS~~	~~Sulphur (Free)~~	***Del***
~~SULPS~~	~~Sulphur (Total)~~	***Del***
THIOS	Thiocyanate	
ORGCW	Total organic carbon	***Rev***
Metals		
AL	Aluminium	***New***
~~ALAS~~	~~Aluminium (Available)~~	***Del***
~~ALTS~~	~~Aluminium (Total)~~	***Del***
SB	Antimony	***Rev***
~~ANAS~~	~~Antimony (Available)~~	***Del***
~~ANTS~~	~~Antimony (Total)~~	***Del***
AS	Arsenic	***Rev***
~~ASAS~~	~~Arsenic (Available)~~	***Del***
~~ASTS~~	~~Arsenic (Total)~~	***Del***
BA	Barium	***Rev***
~~BAAS~~	~~Barium (Available)~~	***Del***
~~BAS~~	~~Barium (Total)~~	***Del***
BE	Beryllium	***Rev***
~~BEAS~~	~~Beryllium (Available)~~	***Del***
~~BES~~	~~Beryllium (Total)~~	***Del***
B	Boron	***Rev***
~~BORAS~~	~~Boron (Available)~~	***Del***
~~BORTS~~	~~Boron (Total)~~	***Del***
CD	Cadmium	***Rev***
~~CDAS~~	~~Cadmium (Available)~~	***Del***
~~CATS~~	~~Cadmium (Total)~~	***Del***
CA	Calcium	***Rev***
CR	Chromium	***Rev***
~~CHROS~~	~~Chromium (Hexavalent)~~	***Del***
~~CHRTS~~	~~Chromium (Total)~~	***Del***
CO	Cobalt	***Rev***
~~COAS~~	~~Cobalt (Available)~~	***Del***
~~COTA~~	~~Cobalt (Total)~~	***Del***
CU	Copper	***Rev***
~~CUAS~~	~~Copper (Available)~~	***Del***
~~CUTS~~	~~Copper (Total)~~	***Del***
FE	Iron	***Rev***
~~FEAS~~	~~Iron (Available)~~	***Del***
~~FESS~~	~~Iron (Soluble)~~	***Del***
~~FETS~~	~~Iron (Total)~~	***Del***
PB	Lead	***Rev***
~~PBAS~~	~~Lead (Available)~~	***Del***
~~PBTS~~	~~Lead (Total)~~	***Del***
MG	Magnesium	***Rev***

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
~~MGAS~~	~~Magnesium (Available)~~	***Del***
~~MGDS~~	~~Magnesium (Dry weight)~~	***Del***
~~MGTS~~	~~Magnesium (Total)~~	***Del***
MN	Manganese	***Rev***
~~MNAS~~	~~Manganese (Available)~~	***Del***
~~MNDS~~	~~Manganese (Dry weight)~~	***Del***
~~MNGS~~	~~Manganese (Total)~~	***Del***
HG	Mercury	***Rev***
~~HGAS~~	~~Mercury (Available)~~	***Del***
~~HGDS~~	~~Mercury (Dry weight)~~	***Del***
~~HGTS~~	~~Mercury (Total)~~	***Del***
MO	Molybdenum	***Rev***
~~MOAS~~	~~Molybdenum (Available)~~	***Del***
~~MODS~~	~~Molybdenum (Dry weight)~~	***Del***
~~MOTS~~	~~Molybdenum (Total)~~	***Del***
NI	Nickel	***Rev***
~~NIAS~~	~~Nickel (Available)~~	***Del***
~~NIDS~~	~~Nickel (Dry weight)~~	***Del***
~~NITS~~	~~Nickel (Total)~~	***Del***
K	Potassium	***Rev***
~~POAS~~	~~Potassium (Available)~~	***Del***
~~POTS~~	~~Potassium (Total)~~	***Del***
SE	Selenium	***Rev***
~~SEAS~~	~~Selenium (Available)~~	***Del***
~~SES~~	~~Selenium (Total)~~	***Del***
SI	Silicon	***New***
AG	Silver	***New***
~~SIAS~~	~~Silver (Available)~~	***Del***
~~SITS~~	~~Silver (Total)~~	***Del***
NA	Sodium	***Rev***
SR	Strontium	***Rev***
SN	Tin	***Rev***
~~SNAS~~	~~Tin (Available)~~	***Del***
~~SNS~~	~~Tin (Total)~~	***Del***
V	Vanadium	***Rev***
~~VNAS~~	~~Vanadium (Available)~~	***Del***
~~VNS~~	~~Vanadium (Total)~~	***Del***
ZN	Zinc	***Rev***
~~ZNAS~~	~~Zinc (Available)~~	***Del***
~~ZNTS~~	~~Zinc (Total)~~	***Del***
Non-specific organics		
ALCO	Alcohols	***New***
HYDRS	Aromatic hydrocarbons	
AVF	Aviation fuel	***New***
COALS	Coal tar derivatives	
~~CYCLS~~	~~Cyclohexane extract~~	***Del***
DRO	Diesel range organics	***New***
HALO	Halogenated compounds	***New***
MOILS	Mineral oils	

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
NSOS	NSO/Resins	***New***
PRO	Petrol range organics	***New***
HCARS	Polynuclear aromatic hydrocarbons (Total)	
SOLVS	Solvent extractable matter	
TPH	Total petroleum hydrocarbons	***New***
Organochlorine Pesticides		
44DDD	4,4 - DDD	
44DDE	4,4 - DDE	
44DDT	4,4 - DDT	
ALD	Aldrin	
ABHC	alpha - BHC	
AHCH	alpha - HCH	***New***
BBHC	beta - BHC	***Rev***
BHCH	beta - HCH	***New***
DBHC	delta - BHC	***Rev***
DIEL	Dieldrin	
ENDOI	Endosulfan I	
ENDOII	Endosulfan II	
ENDSUL	Endosulfan sulphate	
ENDR	Endrin	
ENDALD	Endrin aldehyde	
GBHC	gamma - BHC	***Rev***
GHCH	gamma - HCH	***New***
HEPC	Heptachlor	
HEPEPO	Heptachlor epoxide	
HCHLB	Hexachlorobenzene	***New***
ISOD	Isodrin	***New***
LIND	Lindane	***New***
METXC	Methoxychlor	***New***
PPTDE	ppTDE	***New***
TECZ	Tecnazene	***New***
TRIF	Trifluralin	***New***
Organophosphorus Pesticides		
AZPE	Azinphos-ethyl	***New***
AZPM	Azinphos-methyl	***New***
CFP	Chlorfenvinphos	***New***
CPYR	Chlorpyrifos	***New***
DEMS	Demeton - S	***New***
DIAZ	Diazinon	***New***
DCV	Dichlorvos	***New***
DMETH	Dimethoate	***New***
DST	Disulfoton	***New***
EPAR	Ethyl parathion	***New***
ETRP	Etrimphos	***New***
FTT	Fenotrothion	***New***
FENT	Fenthion	***New***
HEPP	Heptenophos	***New***
IODP	Iodofenphos	***New***
MALTH	Malathion	***New***

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
METC	Methacriphos	***New***
METP	Methyl parathion	***New***
MEVP	Mevinphos	***New***
PARTH	Parathion	***New***
PHOR	Phorate	***New***
POSPM	Phosphamidon	***New***
PIRIM	Pirimiphos	***New***
PROPP	Propetamphos	***New***
TRIZP	Triazophos	***New***
PAHs		
ACNEN	Acenaphthene	
ACNAP	Acenaphthylene	
ANTHN	Anthracene	
BENA	Benzo (a) anthracene	
BENAP	Benzo (a) pyrene	
BENB	Benzo (b) fluoranthene	
BENGI	Benzo (ghi) perylene	
BENK	Benzo (k) fluoranthene	
CRYN	Chrysene	
DIABN	Dibenzo (ah) anthracene	***Rev***
FLNN	Fluoranthene	
FLN	Fluorene	
INDP	Indeno (1,2,3 - cd) pyrene	
NAPTHH	Naphthalene	***Rev***
NAP1M	Naphthalene 1 - methyl -	***New***
NAP12D	Naphthalene 1,2 - dimethyl -	***New***
PAHS	PAH (Total)	***New***
PPENN	Phenanthrene	
PYRN	Pyrene	
PCBs		
A1016	Aroclor 1016	***New***
A1221	Aroclor 1221	***New***
A1232	Aroclor 1232	***New***
A1242	Aroclor 1242	***New***
A1248	Aroclor 1248	***New***
A1254	Aroclor 1254	***New***
A1260	Aroclor 1260	***New***
A1262	Aroclor 1262	***New***
BICPB	Bichlorobiphenyl	
DECPB	Decachlorobiphenyl	
HEPPB	Heptachlorobiphenyl	
HEXPB	Hexachlorobiphenyl	
MONPB	Monochlorobiphenyl	
NONPB	Nonachlorobiphenyl	
OCTPB	Octachlorobiphenyl	
PCB101S	PCB101	***New***
PCB118S	PCB118	***New***
PCB138S	PCB138	***New***
PCB153S	PCB153	***New***

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
PCB156S	PCB156	***New***
PCB180S	PCB180	***New***
PCB28S	PCB28	***New***
PCB31S	PCB31	***New***
PCB52S	PCB52	***New***
PENPB	Pentachlorobiphenyl	
PCBS	Polychlorinated biphenyls	
~~PCBPS~~	~~Polychlorinated biphenyls - presence of (<50mg/kg or >50mg/kg)~~	***Del***
TETPB	Tetrachlorobiphenyl	
TRICPB	Trichlorobiphenyl	
Phenols		
2CP	2 - Chlorophenol	
~~2M46DNP~~	~~2 - Methyl - 4,6 - Dinitrophenol~~	***Del***
2MP	2 - Methylphenol	***New***
2NP	2 - Nitrophenol	
2346TCP	2,3,4,6 - Tetrachlorophenol	***Rev***
24DCP	2,4 - Dichlorophenol	
24DMP	2,4 - Dimethylphenol	
~~24DNP~~	~~2,4 - Dinitrophenol~~	***Del***
245TCP	2,4,5 - Trichlorophenol	
246TCP	2,4,6 - Trichlorophenol	
26DCP	2,6 - Dichlorophenol	
34MP	3,4 - Methylphenol	***New***
4C3MP	4 - Chloro - 3 - Methlphenol	
4CP	4 - Chlorophenol	***New***
4MP	4 - Methylphenol	***New***
4NP	4 - Nitrophenol	
CPHE	Chlorophenols (Total)	***New***
CRES	Cresols	***New***
DCPHE	Dichlorophenol (Total)	***New***
DIMPH	Dimethylphenols	***New***
IPP	Isopropyl phenol	***New***
METHP	Methylphenols	***New***
MCPHE	Monochlorophenol (Total)	***New***
NAPHOLS	Naphthols	***New***
NONP	Nonylphenol	***New***
OCP	o - Cresol	
PCP	p - Cresol	
PNCP	Pentachlorophenol	
PHE	Phenol	***New***
PHEMS	Phenol (Monohydric)	
PHETS	Phenol (Total)	
PHEIDX	Phenol Index	***New***
4TCP	Tetrachlorophenol (Total)	***New***
TCPHE	Trichlorophenol (Total)	***New***
TMPHE	Trimethylphenols	***New***
XYL	Xylenols	***New***
XEP	Xylenols & Ethylphenols	***New***
Radioactive		

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
RDN	Radon	***New***
Semivolatile Organics		
2CNAP	2 - Chloronaphthalene	***New***
2MNAP	2 - Methylnaphthalene	***New***
2NA	2 - Nitroaniline	***New***
24DNT	2,4 - Dinitrotoluene	***New***
26DNT	2,6 - Dinitrotoluene	***New***
3NA	3 - Nitroaniline	***New***
4BPPE	4 - Bromophenylphenyl ether	***New***
4CA	4 - Chloroaniline	***New***
4CPPE	4 - Chlorophenyl phenyl ether	***New***
4NA	4 - Nitroaniline	***New***
AZB	Azobenzene	***New***
B2CEE	bis (2 - chloroethoxy) ether	***New***
B2CEM	bis (2 - chloroethoxy) methane	***New***
B2CIPE	bis (2 - chloroisopropyl) ether	***New***
BBP	Butyl benzyl phthalate	***New***
DNOP	Di - n - octyl phthalate	***New***
DBF	Dibenzofuran	***New***
DEP	Diethyl phthalate	***New***
DIMP	Dimethyl phthalate	***New***
HCCP	Hexachlorocyclopentadiene	***New***
HCE	Hexachloroethane	***New***
ISOP	Isophorone	***New***
NNNP	n - Nitrosodi - n - Propylamine	***New***
NITB	Nitrobenzene	***New***
PHTH	Phthalates (Total)	***New***
Unclassified		
11BIP	1,1 - Biphenyl	***New***
12BIP	1,2 - Biphenyl	***New***
2BUT	2 - Butanone	***New***
ACET	Acetaldehyde	***New***
BUTA	Butanoic acid, 1 - methyloctyl ester	***New***
CARB	Carbaryl	***New***
CARF	Carbofuran	***New***
CATE	Catechol	***New***
CHETH	Chloroethene	***New***
CNAP	Chloronaphthalene	***New***
CNA	Chloronitroaniline	***New***
DBE	Dibromoethane	***New***
DBT	Dibutyl tin	***New***
EGLW	Ethylene glycol	***New***
FCAM	Furancarboxaldehyde methyl-	***New***
LANGW	Langelier Index	***New***
MANE	Maneb (ACN)	***New***
~~OCHLS~~	~~Organic chlorine~~	***Del***
PBLS	Organo lead	
TIOS	Organo tin	
ORGS	Organosulphur compounds	***New***

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
PGLW	Propylene glycol	***New***
PYR	Pyridine	***New***
RESO	Resorcinol	***New***
TR4MS	Tetrachloromethane	***New***
THF	Tetrahydrofuran	***New***
THT	Tetrahydrothiophene	***New***
TBT	Tributyl tin	***New***
TPT	Triphenyl tin	***New***
UREA	Urea	***New***
VOLS	Volatiles	***New***
Volatile Organics		
11DCP	1,1 - Dichloropropene	***New***
1112TCE	1,1,1,2 - Tetrachloroethane	***New***
112T122T	1,1,2 - Trichloro - 1,2,2 - Trifluoroethane	***New***
12D3C	1,2 - Dibromo - 3 - Chloropropane	***New***
12DIB	1,2 - Dibromoethane	***New***
123TCB	1,2,3 - Trichlorobenzene	***New***
123TCP	1,2,3 - Trichloropropane	***New***
124TCB	1,2,4 - Trichlorobenzene	***New***
124TMB	1,2,4 - Trimethylbenzene	***New***
13DP	1,3 - Dichloropropane	***New***
135TCB	1,3,5 - Trichlorobenzene	***New***
135TMB	1,3,5 - Trimethylbenzene	***New***
2CT	2 - Chlorotoluene	***New***
22DP	2,2 - Dichloropropane	***New***
4CT	4 - Chlorotoluene	***New***
4IPT	4 - Isopropyltoluene	***New***
BROMBE	Bromobenzene	***New***
BROMCM	Bromochloromethane	***New***
12DEE	cis 1,2 - Dichloroethene	***New***
13DCPE	cis 1,3 - Dichloropropene	***New***
DIBROM	Dibromomethane	***New***
DICM	Dichloromethane	***New***
HEXBUT	Hexachlorobutadiene	***New***
IPB	iso - Propylbenzene	***New***
MTBE	MTBE	***New***
NBUT	n - Butylbenzene	***New***
NPB	n - Propylbenzene	***New***
SECB	sec - Butylbenzene	***New***
STY	Styrene	***New***
TERTB	tert - Butylbenzene	***New***
TBM	Tribromomethane	***New***
TR3MS	Trichloromethane	***New***
Water tests		
ALKBW	Alkalinity - Bicarbonate as CaCO3	***New***
ALKCW	Alkalinity - Carbonate as CaCO3	***New***
~~AMMNW~~	~~Ammoniacal nitrogen~~	***Del***
AIDW	Anionic detergents	***New***
BICAW	Bicarbonate	

Group Name : CODE - CNMT 'Pick' List Codes		
CODE_CODE	**CODE_DESC**	
BIOXW	Biochemical oxygen demand	
~~CAW~~	~~Calcium~~	***Del***
HARDW	Calcium hardness as Calcium carbonate	***New***
CATW	Cationic detergents	***New***
CHOXW	Chemical oxygen demand	***Rev***
~~CHHYW~~	~~Chlorinated hydrocarbons~~	***Del***
CHLOW	Chlorine	***Rev***
CHDW	Chlorine demand	***New***
~~CNCW~~	~~Cyanide (Complex)~~	***Del***
~~CNFW~~	~~Cyanide (Free & Simple)~~	***Del***
~~CNTW~~	~~Cyanide (Total)~~	***Del***
DO	Dissolved oxygen	***New***
CONDW	Electrical conductivity	
EHW	Electrolytic potential	***New***
~~FECNW~~	~~Ferro-ferricyanide~~	***Del***
~~FLW~~	~~Fluoride~~	***Del***
~~CHRH~~	~~Hexavalent chromium~~	***Del***
~~HDW~~	~~Hydrocarbons (Total)~~	***Del***
~~NITRW~~	~~Kjeldahl nitrogen (Total)~~	***Del***
~~MOILW~~	~~Mineral oils~~	***Del***
~~NITAW~~	~~Nitrate~~	***Del***
~~NITIW~~	~~Nitrite~~	***Del***
NIDW	Nonionic detergents	***New***
~~ORTHW~~	~~Orthophosphate (Total)~~	***Del***
~~OXYDW~~	~~Oxygen (Dissolved)~~	***Del***
~~PETRW~~	~~Petroleum ether extractable matter~~	***Del***
~~PHS~~	~~pH~~	***Del***
~~PHEMW~~	~~Phenol (Monohydric)~~	***Del***
~~PHETW~~	~~Phenol (Total)~~	***Del***
~~PHOTW~~	~~Phosphate (Total)~~	***Del***
~~PHPTW~~	~~Phosphorous (Total)~~	***Del***
~~PCBW~~	~~Polychlorinated biphenyls~~	***Del***
~~PLBPW~~	~~Polychlorinated biphenyls - presence of (<50mgl-1 or >50mgl-1)~~	***Del***
~~HCARW~~	~~Polynuclear aromatic hydrocarbons~~	***Del***
REPTW	Redox potential	
~~SULAW~~	~~Sulphate~~	***Del***
~~SULIW~~	~~Sulphide~~	***Del***
~~ESULW~~	~~Sulphur (Elemental)~~	***Del***
~~THIOW~~	~~Thiocyanate~~	***Del***
DISS	Total dissolved solids	
THW	Total hardness	***New***
TIC	Total inorganic carbon	***New***
TONIW	Total oxidised nitrogen	
SUSP	Total suspended solids	
TURBW	Turbidity N T U	***New***
VFATW	Volatile fatty acids	
VSOLW	Volatile suspended solids	

Group Name : UNIT - Unit 'Pick' List		New
UNIT_UNIT	**UNIT_DESC**	
Length		
mm	millimetre	*New*
cm	centimetre	*New*
m	metre	*New*
km	kilometre	*New*
in	inch	*New*
ft	foot	*New*
yd	yard	*New*
mi	mile	*New*
Area		
cm2	square centimetre	*New*
m2	square metre	*New*
km2	square kilometre	*New*
hect	hectare	*New*
in2	square inch	*New*
ft2	square foot	*New*
yd2	square yard	*New*
mi2	square mile	*New*
acre	acre	*New*
Volume		
cm3	cubic centimetre	*New*
m3	cubic metre	*New*
l	litre	*New*
in3	cubic inch	*New*
ft3	cubic foot	*New*
yd3	cubic yard	*New*
gal	gallon	*New*
Force		
N	Newton	*New*
kN	kiloNewton	*New*
MN	megaNewton	*New*
lbf	pounds force	*New*
tonf	tons force	*New*
kgf	kilograms force	*New*
Mass		
g	gram	*New*
kg	kilogram	*New*
Mg	megagram (tonne)	*New*
lb	pound	*New*
t	ton	*New*
kips	kilopound	*New*
Pressure		
kN/m2	kiloNewtons per square metre	*New*
kPa	kiloPascal	*New*
MN/m2	megaNewtons per square metre	*New*
MPa	megaPascal	*New*
GPa	gigaPascal	*New*
psi	pounds per square inch	*New*
psf	pounds per square foot	*New*

Group Name : UNIT - Unit 'Pick' List		New
ksi	kips per square inch	New
ksf	kips per square foot	New
tsf	tons per square foot	New
kg/cm2	kilograms per square centimetre	New
bar	bar	New
Density		
kN/m3	kiloNewtons per cubic metre	New
Mg/m3	megagrams per cubic metre	New
pcf	pounds per cubic foot	New
g/cm3	grams per cubic centimetre	New
kg/m3	kilograms per cubic metre	New
Time		
s	second	New
min	minute	New
hr	hour	New
day	day	New
month	month	New
yr	year	New
hhmm	hours minutes	New
hhmmss	hours minutes seconds	New
dd/mm/yyyy	day month year	New
Velocity		
mm/s	millimetres per second	New
cm/s	centimetres per second	New
m/s	metres per second	New
km/hr	kilometres per hour	New
ft/min	feet per minute	New
mph	miles per hour	New
Flow		
l/s	litres per second	New
l/min	litres per minute	New
m3/s	cubic metres per second	New
gpm	gallons per minute	New
mgd	million gallons per day	New
cfs	cubic feet per second	New
Concentration		
ug/l	micrograms per litre	New
mg/l	milligrams per litre	New
g/l	grams per litre	New
ug/kg	micrograms per kilogram	New
mg/kg	milligrams per kilogram	New
ppb	parts per billion	New
ppm	parts per million	New
%	percentage	New
% dry weight	percentage of dry weight	New
%vol	percentage volume	New
colonies/ml	colonies per millilitre	New
colonies/l	colonies per litre	New
CFU/ml	colony forming units per millilitre	New
CFU/g	colony forming units per gram	New

Group Name : UNIT - Unit 'Pick' List		
MPN/ml	most probable number per millilitre	***New***
MPN/100ml	most probable number per 100 millilitres	***New***
MPN/l	most probable number per litre	***New***
Miscellaneous		
m2/MN	square metres per megaNewton	***New***
ft2/t	square feet per ton	***New***
m2/yr	square metres per year	***New***
ft2/yr	square feet per year	***New***
ft2/day	square feet per day	***New***
Nm	Newton metre	***New***
deg	degree (angle)	***New***
DegC	degree Celsius	***New***
DegF	degree Fahrenheit	***New***
uV	microVolt	***New***
mV	milliVolt	***New***
ohm	Ohm	***New***
ohmcm	Ohm centimetre	***New***
uS/cm	microSiemens per centimetre	***New***
kJ/kg	kiloJoules per kilogram	***New***
counts/s	counts per second	***New***
Yes	Yes	***New***
No	No	***New***

APPENDIX 2

Example AGS Format File

This example AGS Format file is available for download to registered users on the AGS web site (see Appendix 5).

```
"**PROJ"
"*PROJ_ID","*PROJ_NAME","*PROJ_LOC","*PROJ_CLNT","*PROJ_ENG","*PROJ_CONT","*PROJ_DATE","*PROJ_AGS","FILE_FSET"
"<UNITS>","","","","","","","dd/mm/yyyy","",""
"7845","Trumpington Sewerage","Trumpington","Trumpington District Council","Geo-Knowledge International","Lithosphere Investigations Ltd","23/07/1999","3","FS0001"

"**HOLE"
"*HOLE_ID","*HOLE_TYPE","*HOLE_NATE","*HOLE_NATN","*HOLE_GL","*HOLE_FDEP","*HOLE_STAR","*HOLE_LOG","FILE_FSET"
"<UNITS>","","m","m","m","m","m","dd/mm/yyyy","",""
"TP501","TP","523196","178231","61.86","3.25","21/07/1999","ANO","FS002"
"BH502","IP+CP","523142","178183","58.72","15.45","22/07/1999","ANO","FS003"

"**GEOL"
"*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC","*GEOL_LEG","*GEOL_GEOL","*GEOL_STAT","FILE_FSET"
"<UNITS>","m","m","","","","","",""
"TP501","0.00","0.25","Friable brown sandy CLAY with numerous rootlets (Topsoil)","101","TS","A",""
"TP501","0.25","1.55","Firm brown slightly sandy very closely fissured CLAY with some fine to coarse subrounded gravel. Medium spaced subhorizontal slightly polished gleyed shear surfaces. Widely spaced vertical rough desiccat","","","","",""
"<CONT>","","","ion cracks with concentrations of rootlets. (Weathered Boulder Clay)","261","WBC","B",""
"TP501","1.55","3.25","Stiff grey closely fissured CLAY with a little fine to medium subrounded gravel and rare sandstone cobbles (Boulder Clay)","250","BC","C",""
"BH502","0.00","0.30","Friable brown sandy CLAY with numerous rootlets (Topsoil)","101","TS","",""
"BH502","0.30","2.60","Firm brown very closely fissured CLAY with a little fine to medium subrounded gravel (Weathered Boulder Clay)","250","WBC","",""
"BH502","2.60","5.75","Stiff grey slightly sandy closely fissured CLAY with some fine to coarse subrounded gravel (Boulder Clay)","261","BC","",""
"BH502","5.75","15.45","Dense becoming very dense yellow brown very sandy fine to coarse subrounded GRAVEL (Glacial Gravels)","307","GG","",""

"**SAMP"
"*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SAMP_TYPE","*SAMP_BASE","*SAMP_DATE","*SAMP_TIME""*GEOL_STAT","FILE_FSET"
"<UNITS>","m","","","m","dd/mm/yyyy","hhmmss","",""
"TP501","1.00","1","D","1.00","","","B",""
"TP501","1.00","2","B","1.30","","","B",""
"TP501","2.50","3","B","2.75","","","C",""
"BH502","1.00","1","U","1.45","","","","","FS058"
"BH502","1.50","2","D","1.50","","","","",""
"BH502","3.00","3","U","3.45","","","","",""
"BH502","3.50","4","D","3.50","","","","",""
"BH502","6.00","5","D","6.45","","","","",""
"BH502","6.00","6","B","6.50","","","","",""
"BH502","9.00","7","D","9.45","","","","",""
"BH502","9.00","8","B","9.50","","","","",""
"BH502","10.00","9","B","10.50","","","","","",""
"BH502","12.00","10","B","12.50","","","","","",""
"BH502","3.00","11","W","3.00","22/07/1999","120000","",""
"BH502","3.00","12","W","3.00","22/07/1999","153000","",""

"**CLSS"
"*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SAMP_TYPE","*SPEC_REF","*SPEC_DPTH","*CLSS_NMC","*CLSS_LL","*CLSS_PL"
"<UNITS>","m","","","","m","%","%","%"
"BH502","1.00","1","U","A","1.10","28","56","22"
"BH502","1.00","1","U","B","1.25","31","62","24"
"BH502","3.00","3","U","","","","28","53","28"
"BH502","3.50","4","D","","","24","",""
```

```
"**CNMT"
"*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SAMP_TYPE","*SPEC_REF","*SPEC_DPTH","*CNMT_TYPE","*CNMT_TTYP","*CNMT_RESL","*CNMT_UNIT"
"<UNITS>","m","","","","m","","","",""
"BH502","3.00","11","W","","","PHS","WATER","7.2",""
"BH502","3.00","11","W","","","SULWS","WATER","0.037","g/l"
"BH502","3.00","11","W","","","CL","WATER","51","mg/l"
"BH502","3.00","12","W","","","SULWS","WATER","0.040","g/l"

"**ISPT"
"*HOLE_ID","*ISPT_TOP","*ISPT_NVAL","*ISPT_REP","*?ISPT_CORN","*?ISPT_EXTP","*ISPT_TYPE"
"<UNITS>","m","","","","","",""
"BH502","6.00","37","8,9/9,10,10,8 N=37","","","S"
"BH502","9.00","45","5,7/8,10,12,15 N=45","30","","S"
"BH502","12.00","","15,18/20,30 (50/120)","","125","C"

"**DETL"
"*HOLE_ID","*DETL_TOP","*DETL_BASE","*DETL_DESC"
"<UNITS>","m","m",""
"BH502","3.20","3.45","3.20-3.45m Boulder of yellow brown sandstone, weak"
"BH502","5.00","5.00","5.00m Becoming very stiff"
"BH502","8.50","9.70","8.50-9.70m Fine sand"

"**DICT"
"*DICT_TYPE","*DICT_GRP","*DICT_HDNG","*DICT_STAT","*DICT_DESC","*DICT_UNIT","*DICT_EXMP"
"HEADING","ISPT","ISPT_CORN","COMMON","Corrected N value in sand","","20"
"HEADING","ISPT","ISPT_EXTP","COMMON","Extrapolated N value","","151"

"**ABBR"
"*ABBR_HDNG","*ABBR_CODE","*ABBR_DESC"
"HOLE_TYPE","CP","Cable percussion (shell and auger)"
"HOLE_TYPE","IP","Inspection pit"
"HOLE_TYPE","TP","Trial pit/trench"
"GEOL_LEG","101","Topsoil"
"GEOL_LEG","250","CLAY with a little gravel"
"GEOL_LEG","261","Slightly sandy CLAY with some gravel"
"GEOL_LEG","307","Very sandy GRAVEL"
"GEOL_GEOL","TS","Topsoil"
"GEOL_GEOL","WBC","Weathered Boulder Clay"
"GEOL_GEOL","BC","Boulder Clay"
"GEOL_GEOL","GG","Glacial Gravels"
"SAMP_TYPE","B","Bulk disturbed sample"
"SAMP_TYPE","D","Small disturbed sample"
"SAMP_TYPE","U","Undisturbed sample - open drive"
"SAMP_TYPE","W","Water sample"
"ISPT_TYPE","C","Cone"
"ISPT_TYPE","S","Split spoon"
"CNMT_TTYP","WATER","Water"

"**CODE"
"*CODE_CODE","*CODE_DESC"
"PHS","pH"
"SULWS","Sulphate"
"CL","Chloride"
```

"**UNIT"
"*UNIT_UNIT","UNIT_DESC"
"m","metre"
"dd/mm/yyyy","day month year"
"hhmmss","hours minutes seconds"
"%","percentage"
"g/l","grams per litre"
"mg/l","milligrams per litre"

"**FILE"
"*FILE_FSET","*FILE_NAME","*FILE_DESC","*FILE_TYPE","*FILE_PROG","*FILE_DATE"
"<UNITS>","","","","","dd/mm/yyyy"
"FS001","siteplan.dwg","Trumpington Sewerage site plan","DWG","AutoCAD Version 14","24/08/1999"
"FS001","text.doc","Trumpington Sewerage geotechnical report text","DOC","Word97","24/08/1999"
"FS002","tp501p01.jpg","Trial Pit TP501 photograph - east face","JPG","PaintShop Pro Version 5.0","21/07/1999"
"FS002","tp501p02.jpg","Trial Pit TP501 photograph - west face","JPG","PaintShop Pro Version 5.0","21/07/1999"
"FS003","bh502p01.jpg","Borehole BH502 inspection pit photograph","JPG","PaintShop Pro Version 5.0","22/07/1999"
"FS058","labp39.jpg","Borehole BH502 photograph - split U100 sample 1.00-1.45m","JPG","PaintShop Pro Version 5.0","20/08/1999"

APPENDIX 3

Security of Media

Media Labelling

Media Index Record

SECURITY OF MEDIA

Backup copies of media

The Producer will make two identical copies of each disk containing AGS Format data.

The first copy will remain the property of the Producer and will be kept by him until the expiry of the contract maintenance period.

The second copy will be given to the Receiver who will be responsible for its long term retention. The Receiver will make a backup copy of the disk for security purposes immediately on receipt.

Media labelling

All magnetic media will be securely labelled and clearly marked with

The title 'AGS Format Data'
The project identification (PROJ_ID)
The date of issue to the Receiver
The name of the Producer
The name of the Receiver
New The AGS Edition number
The unique issue sequence number

Media index record

The Producer will maintain an index detailing for each issue of data.

The heading 'AGS Format Data'
The title 'Media Index Record'
The project identification (PROJ_ID)
The unique issue sequence number
The date of issue to the Receiver
The name of the Producer
New The AGS Edition number
The name of the Receivers representative to whom the media was given
A general description of the data transferred and/or a file listing for associated files

In addition the index will detail for each AGS Format data set, including all associated files.

The file name including the extension
The date of file creation
The time of file creation
The file size in bytes
A general description of the data contained in each file and/or a file listing for associated files

An index sheet should be prepared each time a data set is issued. The Producer should retain one copy of the index sheet and give a copy to the Receiver when the data set is handed over. An example of the form of index to be adopted is included.

The data files shall be checked for viruses before issue.

Where data is transferred via email or similar the media labelling shall be provided in a covering message.

Format for a Media Index Record Sheet

AGS Format ASCII Data
Media Index Record

Project Identification	
Client	
From	

Issue Sequence Number	AGS Edition Number	Issued To & Date of Issue	General Notes

File Name	Creation Date	Creation Time	File Size in Bytes	General Description of data transferred

1. This sheet may be copied.
2. File name, creation date, creation time and file size information may be provided as an attached directory file listing.

APPENDIX 4

Examples of General and Particular Specification Clauses with Associated Notes for Guidance

Introduction

In order to assist in the drafting of ground investigation specifications, examples of the type of clauses and associated notes for guidance for implementing digital data are given in this Appendix. Not all of these clauses are likely to be required in all contracts but the intention is to provide the appropriate clauses for most scales of ground investigation.

General

1 Unless otherwise required in the Contract, the Contractor is to provide field and laboratory data in digital form, as well as in paper form.

2 The definitive copy of the field and laboratory data shall be the paper copy.

Format

3 The format of the digital data files shall comply with the Association of Geotechnical and Geoenvironmental Specialists (AGS) publication `Electronic transfer of geotechnical and geoenvironmental data' 3rd edition.

4 Any new groups or fields shall only be created with the Engineer's approval.

Security

5 All disks, or other agreed transmission media, shall be securely labelled and clearly marked with:

The title `AGS Format Data'
The project identification (PROJ-ID)
The date of issue to the Engineer
The name of the Contractor
The name of the Engineer
The unique issue sequence number

If more than one disk, or other agreed transmission medium, is required, then each shall be clearly labelled to indicate the order in which the Engineer should read the data. The split of the data into separate files shall be decided by the Contractor. The unique sequence number shall run sequentially from the start of the contract. Where more than one disk is required for a particular issue of digital data, this fact shall be clearly identified on the labels in that issue.

6 Until the completion of the maintenance period, the Contractor shall keep an index detailing:

The heading `AGS Format Data'
The title `Media Index Record'
The project identification (PROJ_ID)
The unique issue sequence number
The date of Issue to the Engineer
The name of the Contractor issuing the transmission media
The name of the Engineer to whom the transmission media was issued
A general description of the data transferred and/or a file listing for associated files.

For each AGS Format data set, including all associated files, the index will detail:

The file name including the extension
The date the file was created
The time the file was created
The file size in bytes
A general description of the data contained in each file and/or a file listing for associated files.

The Contractor shall retain one copy of the index sheet and shall issue to the Engineer a copy of the completed index sheet with the disk(s), or other agreed transmission medium.

7 All data files shall be checked for viruses before issue using a recent proprietary anti-virus program.

Preliminary Data

8 The Contractor shall issue digital copies of all preliminary data whenever required by the Engineer.

9 The preliminary data may be subject to update as necessary in the light of laboratory testing and the further examination of samples and cores. When available, laboratory data shall be input.

10 In addition to the labelling given in Clause 5, the disks shall be labelled `PRELIM' and a unique sequence number given to the disk for each issue of digital data to the Engineer.

11 A list of data items not included in the digital data but included in the paper copy shall be provided.

12 All preliminary data in digital form shall be able to be presented in the same form as it is to be used for the Factual Report. The digital data must be produced from the same source/program as that used to produce the factual report.

Factual Report

13 In addition to the labelling given in Clause 5 of this specification, the disk(s), or other agreed transmission media, submitted with the Factual Report shall be labelled `FINAL'.

14 The digital data provided by the Contractor with the Factual Report is required to be complete and a total replacement of any previous preliminary data.

15 In addition to the paper copies of the Factual Report, the Contractor shall provide a Report with a digital copy of those field and laboratory data and associated files specified in the Contract to be in digital form. This report shall consist of a disk(s), or other agreed transmission medium, containing the digital data and associated files, paper copies of any data or drawings not included in digital form. The file format for associated files shall be agreed in advance between the Contractor and the Engineer. The paper copies shall be firmly bound within stiff covers.

Dummy Set of Data

16 Prior to the start of work on the Contract the Contractor shall submit to the Engineer a dummy set of data in the required format for the approval of the Engineer.

Submitting Data

17 Updated disks, or other agreed media, shall be provided as required by the Engineer as work proceeds. The Contractor shall make two identical copies of each disk, whether preliminary or final. The first copy shall be retained by the Contractor until the expiry of the contract maintenance period. The second copy will be issued to the Engineer.

Units of Measurement

18 The preferred units of measurement shall be those given in the AGS publication `Electronic transfer of geotechnical and geoenvironmental data' unless other units of measurement for digital data are given in the Contract. The units of measurement must be given in the AGS Format files, and must be the same as those used in the paper version of the report.

Notes for guidance on the use of the specification for digital data

The numbering of these notes corresponds to the relevant clause number of the specification for digital data.

General

NG 1 A copy of the digital data may in some circumstances accompany every issue of the paper copies and the data shall be subject to the same timing and submission requirements. However, the Engineer may, depending on the contract, prefer to receive digital data only after a significant amount of data has been collected.

NG 2 The paper copy is definitive.

Format

NG 3 The acceptable media for the transmission of data should be given on a site specific basis. The data dictionary defining the data groups and headings is given in the AGS publication `Electronic transfer of geotechnical and geoenvironmental data'.

NG 4 The Engineer is responsible for contacting the AGS to ensure that any digital data proposed to be used, and which are not included in the AGS publication mentioned in NG 3, have not already been assigned a heading. By following this procedure, new standard headings can be issued.

Security

NG 5 It is critical that disks, or other agreed transmission media, are properly labelled to ensure easy identification.

NG 6 The index is also critical to the proper management of disks, or other agreed transmission media. The AGS publication mentioned in NG 3 gives an example of the form of index which can be adopted.

NG 7 The virus scanning software shall be capable of scanning the included associated files, for example for macro viruses.

Preliminary Data

NG 8 Only the preliminary data or Factual Report may be required in digital form for some contracts. The timing of submission of the digital data may also require specifying.

NG 9 The Engineer and the Contractor must be aware of the problems posed by the presence of small sets of data in a series of files and the potential for, and the presence of, errors in the data sets. These become very important if the data is being transferred to a database where incoming data is added to existing data. The organisation of the data prior to issue is the responsibility of the Contractor. The Contractor's system must ensure that data originating from different sources within the Contractor's organisation is compatible.

NG 10 The sequential numbering of data issues must be rigorously adhered to so that no data versions are issued out of sequence. When errors or inconsistencies are noted in the data, by either the Engineer or Contractor, they should be corrected by the Contractor and a corrected data set issued. When a change or addition is made to data within an issue, a complete data group should be reissued, not just the changed fields. This may not require complete replacement of the whole data set which includes other previous issues.

NG 11 The requirement for identification of data items, which are not included in the preliminary data set ensures that no information is left out when each digital data record is issued.

Factual Report

NG 15 The requirements given for the Report containing the digital data are to ensure that the bound volume is as complete as the full paper copy. The requirement for data items, which are not included in the digital data, to be given ensures that no information is left out when the digital data is issued.

Dummy Set of Data

NG 16 This requirement ensures that the Contractor is using the standard headings and that the digital data can be accurately transferred.

Submitting Data

NG 17 The second copy will be given to the Engineer who should, immediately on receipt, make a backup copy for security purposes.

The Engineer is likely to be receiving information from a number of sources within the Contractor's organisation, e.g. field data and laboratory data. The Contractor's data management system must ensure that all issues are compatible and numbered in the correct sequential order. The Engineer must be prepared to manage the data as it arrives. Any file transmitted during the Contract may contain all or part of the data available at that time. It may contain borehole log data, laboratory data or both.

Units of Measurement

NG 18 It is necessary for the Engineer to be certain exactly what the units of measurement are for the data being received. It is recognised that units may be specified elsewhere in the contract. All units must be specified for the digital data in order to ensure an understanding of transferred data.

APPENDIX 5

AGS Format User Support

1 Introduction

The AGS web site is designed to support users of the AGS Format. It contains the latest publication in Acrobat PDF, Word7 and RTF format together with the data dictionary and latest 'pick' list codes in CSV format. The site also contains a discussion board where users can discuss questions with the AGS Format committee members and other users. The web site address is **www.ags.org.uk**.

2 Web Site Format Login

Before you can download the AGS publication or submit questions to the discussion board you must request a login name to access the restricted areas of the web site. Site logins are free of charge and can be requested on line in 5 to 10 minutes. When the on site form is completed you will be emailed an activation code for your account and instructions on how to log on.

3 Discussion board

The discussion board is an area of the web site that has been designed for the support of AGS Format users. If you are in any doubt on the use of a particular aspect of the Format then you are advised to consult the discussion board for questions and discussions on the particular subject.

If you are unable to find the information you require on a current discussion thread then you can place a new question on the discussion board. The discussion board is monitored by the AGS and you should receive an answer to your questions within a couple of days.

Full instructions on how to use the discussion board are available on the web site.

4 'Pick' List Codes

The latest version of the 'pick' list codes can be viewed and downloaded from the web site. Users should check this list before defining a non-standard 'pick' list code. If the required 'pick' list item is not on the web site list then you may submit it to the on-line suggestion box. All suggestions will be considered and commented on by the AGS Format Working Party. Appropriate codes will be added to the web site list and an update notification emailed to all registered users of the AGS Format.

5 Downloading This Publication

Registered users of the AGS Web site can download this document in Acrobat PDF file format free of charge. The document is distributed as shareware and can be read without charge.

6 AGS Format Registration

If your company uses the AGS Format to transmit data electronically we request that you register your use of the AGS Format for a small fee. A list of registered companies is available on the web site. Registration forms and information on current charges can be downloaded from the web site.

If you receive AGS Format data we ask you to ensure that your data producer is registered to use the AGS Format.

7 Update Notification

Registered users of the Format will receive AGS Format news and updates by email.

8 Registration Benefits

Registered users of the format will also;

Be sent this publication in RTF and Word 7 format
Be sent the current 'pick' lists and data dictionary in CSV file format
Be able to use the AGS Data Logo on their reports
Be able to download the example AGS file from the web site
Be included on the list of registered users
Make suggestions for future additions of the AGS Format

9 Suggestions for Future Additions

Registered users of the format will be able to suggest additions to the format's data dictionary via an on-line suggestion box. All suggestions will be considered and commented on by the AGS committee and all appropriate suggestions will be included in the next release of the format.

APPENDIX 6

Suggested Usage of the AGS Format

Introduction

This Appendix is intended to help both new and experienced users of the AGS Format. It presents some general issues; provides guidance on avoiding common problems; explains how to use the Format to report less frequently used data and introduces features that are new to Version 3.

If you have a specific problem in using the AGS Format which is not addressed in this Appendix, then refer to the Discussion Forum on the AGS web site (see Appendix 5) to see if your query has already been answered, or ask a question of the AGS Format committee.

Key to symbols

The indicated text provides general information that is relevant to users of the AGS Format.

The indicated text describes an AGS recommended procedure.

The indicated text describes a typical usage of the AGS Format. The AGS would welcome suggestions from users of other ways that this aspect of the AGS Format can be carried out. Suggestions should be made in the Discussion Forum on the AGS web site.

Contents

1 Data format, data integrity and data correctness checks

The AGS Format is designed for the transfer of geotechnical data between a Provider and a Receiver. The data will be produced by a software program and received into another program. It is tempting for both the Provider and Receiver to assume that because the data has been output from a computer program it must be correct. This is a dangerous assumption. The onus is on the Provider to produce correct data, but the Receiver should also satisfy himself that it is correct, before using it. There is a series of checks that both Provider and Receiver should carry out on each data set issued or received.

a) Data format checks

Does the data format comply 100% with the format defined by the AGS Rules set out in this document?

i) The best way to check the data format is to use one of the commercially available AGS data format checking programs. The available programs are listed on the software page of the AGS web site at **www.ags.org.uk**. A data format checking program should allow you to check the following:

- Is the PROJ Group present in the data file.
- Is the total line length correct.
- Are <CONT> continuation lines handled correctly.
- Are there missing or extra commas or quotation marks.
- Are the Group and Heading names correct.
- Is the <UNITS> line present.
- The program may also check other aspects of the data format.
- The program will not be able to check that the columns of data line up correctly under the correct Heading or Units, so the file should be imported into a spreadsheet to check this (see (ii) below).

ii) If an AGS Format checking program is not available then a partial check may be carried out by importing each data file into a spreadsheet.

- Import the AGS File into the spreadsheet using the Comma Separated Value (CSV) import filter.
- If the Headings continue onto a second line, they will not line up over the correct column. Cut and paste them to the correct columns.
- If the Units continue onto a second line they will not line up over the correct column. Cut and paste them to the correct columns.
- Check that all the columns of data line up correctly under the correct column Heading, if not, there are some missing commas or other problems in the data set.
- Check that the Units are appropriate for the Heading that they are under. If not there may be some missing commas or the wrong Units may have been given.
- Make sure that no quotation marks appear in the data. If they do this will often highlight mismatched quotation marks.
- Check that the <CONT> continuation lines follow on correctly. Look particularly at long stratum descriptions in the GEOL Group.
- Beware, if you are subsequently going to import the AGS file into a specialist program that expects strict AGS Format files, then do not edit or save the AGS file from your spreadsheet if it does not produce strict AGS Format CSV files (see Section 2 below).

iii) The data files can be imported into a word processor or text editor and checked by eye.

- Switch off word wrapping, or set the line length to greater than 240 characters. Use a non-proportional font.
- Checking by eye is extremely tedious and it is not easy to spot formatting errors. However, it is sometimes necessary to resort to this, when methods (i) and (ii) fail to show up format problems which may prevent the data from being read correctly.

b) Data integrity checks

The AGS Format defines a hierarchy of the data Groups, with the HOLE Group at the top and all the other data Groups below this in an inverted tree-like structure. Each Group is linked to the one above it and the one(s) below it by Key Fields. For this structure to work correctly the data in the Key Fields must be consistent. If the Key Field data is not consistent, or is missing, then the integrity of the data set breaks down and data may be 'lost' or unrecognisable to the Receiver's software.

i) Data integrity checks could be carried out by eye on a small data set.

- Import each table into a spreadsheet. If the Headings or Units continue onto a second line cut and paste them to the correct columns and print it out.
- Carry out the checks and cross-checks described below in (ii).
- It is not practical to carry out this process by eye on a data set with anything more than a dozen or so holes.

ii) For medium to large size data sets an integrity check can only be sensibly and rigorously carried out by one of the commercially available geotechnical relational database programs that has in-built data integrity checking procedures. The available programs are listed on the software page of the AGS web site at **www.ags.org.uk**. The program should check for the following integrity problems:

- Each line of data in every Group must have a combination of data in the Key Fields that is not repeated in any other lines of data in that Group. This unique combination of Key Field data must exist wherever there is a related item in any Group lower down in the hierarchy. As one progresses down the hierarchy additional Key Fields are required to ensure this uniqueness at each level. This is illustrated in more detail below.
- The borehole and trial pit numbers given in the HOLE Group must be unique. If there are two boreholes numbered BH1 in the data set, for example due to a re-drill at an adjacent location, then this is a data integrity error and must be changed. One of the boreholes must be re-numbered BH1A.
- The borehole or trial pit number must be consistent throughout the data set. For example, borehole BH1A must always be written exactly in this way. Variants such as Borehole 1A, BH1a, BH1, BH-1A, BH1(A), BH 1A, 1A etc are not acceptable. The program will check every data Group below HOLE in the hierarchy and every line of data in every Group must have a borehole number which is in HOLE. If the borehole number is not in HOLE or is formatted differently from the version in HOLE or is missing then this is an integrity error and must be corrected.

- For every sample in the data set, and for every test on every sample, there must be a unique, unambiguous and consistent combination of borehole number, sample top depth, sample reference number and sample type. For example, the first four samples in the following table are uniquely defined, but the fifth sample is ambiguous, and does not satisfy data integrity, and must be corrected.

HOLE_ID	SAMP_TOP	SAMP_REF	SAMP_TYPE
BH1A	9.50	10	D
BH1A	10.00	10	D
BH1A	10.00	11	D
BH1A	10.00	11	W
BH1A	10.00	11	

  It is good practice to give a sample top depth, sample reference number and sample type to every sample. It is also preferable to have unique sample reference numbers in each borehole as this then provides a cross check against sample labelling errors. Data integrity can also be obtained where every sample is given a unique reference number.

- The combination of HOLE_ID, SAMP_TOP, SAMP_REF and SAMP_TYPE given in the SAMP Group for a sample, must be repeated exactly in all the Groups below SAMP in the hierarchy, for all tests on that sample. There must not be any laboratory test results in any Group that have a combination of HOLE_ID, SAMP_TOP, SAMP_REF and SAMP_TYPE that does not appear in the SAMP Group.

- The SPEC_REF and SPEC_DPTH fields in all the laboratory testing Groups below SAMP in the hierarchy are intended to be used when two or more sub-samples are taken from a sample, and tested independently. If this is done, then each sub-sample tested must have a unique combination of SPEC_REF and SPEC_DPTH, and this combination must be identical for all tests carried out on that sub-sample.

- If the same test type is repeated on the same sample more than once, then each test result must be given a different SPEC_REF.

- If a sample has only one specimen prepared from it, and one test of a given type carried out, then the SPEC_REF and SPEC_DPTH fields may be left blank (ie. a null "" character should be placed in them).

- All the Groups that relate to insitu testing and monitoring have either a depth or date plus time Key Fields. The combination of HOLE_ID and the depth or date plus time must be unique for each test result.

- Laboratory and insitu testing Groups that are linked in pairs of a General Group and a Detail Group (see Section 5 below) have a point number, stage number or increment number in the Detail Group, and this must be unique for each point, stage or increment of the test.

iii) The golden rules for data integrity are:

- Within each Group the Key Fields must contain sufficient information that uniquely identifies that item of data within that Group. There must be no duplicates and no ambiguities.

- The data in the Key Fields must be identical in the Groups both above and below each Group in the hierarchy, to ensure that the data can be linked together correctly.

- As you move down the hierarchy of Groups to increasing levels of detail, more Key Fields are needed at each level to ensure that the data is uniquely identified.

c) Data correctness checks

Perhaps the most difficult check to carry out is to determine if the data given in the AGS file is correct. This check can only be automated to a certain degree, and relies largely on careful checking by eye, and on the experience of the checker to spot rogue results. The following checks should be carried out. Some of these checks apply only to the AGS data set, but others are of a more general nature, and apply equally to the paper version of the report.

i) AGS Format checks

- Is the data set complete? Have all the investigations and tests carried out been fully reported.
- Does the data given in the AGS file agree 100% with the data given in the paper report?
- Are the <UNITS> correct? The data Provider's software may add the <UNITS> fields automatically, without the intervention of the person who has typed in the data, and errors can result.
- Are the <UNITS> the same as the preferred units given in this document? Different units may be used, but the Receiver should ensure that the receiving software correctly identifies the units.

ii) General checks on the AGS file and the paper report

- Is the data factually correct? Are there any systematic errors that effect all the results of a particular test type, and are there any rogue results that effect just a few of the results? These problems are often only spotted once someone starts to use the results, and analyse them in detail. It is prudent to do some quick depth plots of data during the checking process to look for rogue or anomalous results. Some of the geotechnical database programs allow the user to set minimum and maximum values for each test result, and any values falling outside this range are flagged as anomalous.
- Have the calculations of test results been carried out correctly.
- Have the interpretations within the 'factual' data been carried out correctly. Such as, have the correct geological stratum names been assigned to each stratum.

2 Using a spreadsheet to create or edit AGS Format data

a) Data integrity problems

The AGS Format has been designed so that it can be created and viewed in a spreadsheet. This can work quite satisfactorily for small investigations where it is practical to carryout the checks described in Section 1 above by eye. However, with medium to large investigations it is impractical to carry out these checks with sufficient rigor and in particular, experience has shown that it becomes impossible to maintain data integrity within a large data set. Inconsistent borehole and sample numbering becomes almost inevitable when many spreadsheets are created by a number of different people.

b) CSV file format problems

When the AGS Format was first conceived in 1992, most of the spreadsheet programs on the market were able to output files in CSV (Comma Separated Value) format, with each variable on a line separated from the next by a comma. If all the values (text, number or date) were forced to be in text format they would each be surrounded by inverted commas. This became the basis of the AGS Format. However, with the march of software progress, spreadsheet programs have become more "intelligent", and a number of the current spreadsheets output CSV format files that only put inverted commas around text fields that contain commas in the text. All other text, number or date fields are not surrounded by inverted commas. If a text field includes an inverted comma in the text, the inverted comma may be bracketed by two inverted commas. Any of these variants of the CSV format would not satisfy the AGS Format Rules. Also, leading or trailing zeros may be truncated from numbers, and the date format may be altered. As a result of these inconsistencies, spreadsheet generated or edited CSV files may not be handled correctly by programs designed to receive strict AGS Format files.

To check whether your spreadsheet is capable of producing AGS Format data files run the following test:

- Open a new blank spreadsheet. Select the whole spreadsheet, and set all the cells to text format.
- Type in the following three lines of data:

a	b	c	d
1	2.00	0.03	
	a,a	b"b	01/11/1999

- Save the spreadsheet in CSV format.
- Open the CSV file in a text editor, such as Notepad, using a non-proportional font, with all formatting and word-wrapping switched off. You should see the following file:

  "a","b","c","d"
  "1","2.00","0.03",""
  "","a,a","b"b","01/11/1999"

- If you see anything else, your spreadsheet has failed the test.

Excel95 and Excel97 fail this test and can not be used by themselves to create or edit AGS Format files. However, Excel add-ins are available that overcome this problem and are referenced on the software page of the AGS web site at **www.ags.org.uk**.

3 Using a relational database to create or edit AGS Format data

For medium to large projects it is essential to use a dedicated geotechnical relational database to generate the AGS data set to ensure data integrity. Such a program should be able to handle all the geotechnical data for a project, from borehole logs, insitu tests, monitoring test results to laboratory test results. The program should have 'persistent referential integrity' built in to it, which can not be overridden or circumvented and this will ensure that the borehole and sample numbers are consistent throughout the database. The available geotechnical relational database programs that utilise the AGS Format are referenced on the software page of the AGS web site at www.ags.org.uk

The golden rules for producing high quality, correct AGS Format data are:

- All the data is entered into one dedicated program which has in-built rules for enforcing data integrity.
- Each item of data is only entered once. For example, the sample details are only input when the borehole log is being typed in. When the laboratory test results are being input, the sample details are called up from the program and do not have to be entered again.
- All the pages for the paper report (the borehole logs, the laboratory test summary tables etc) are produced directly from the same database and by the same program at the same time as the AGS Format data files are produced.
- The program has some in-built procedures for checking for gross errors and rogue results.
- The checking of the data is thorough, is done on the paper version of the data and includes the plotting out of the data to spot rogue results.
- A person with appropriate experience who is able to spot rogue results, errors and inconsistencies should review the data.
- The AGS Format data files are run through a format-checking program before being issued.
- Use of a spreadsheet program alone cannot satisfy the above requirements. Only a dedicated geotechnical relational database program (or a spreadsheet with sophisticated macros that emulate the behaviour of a relational database) can be expected to produce high quality AGS Format data for medium to large size projects. However, a database program cannot perform miracles; it requires correct data to be input, by competent people, who carry out thorough checking before issuing any output.

4 Backward and forward compatibility

Software designed to read Version 3 of the AGS Format should also be able to read data in Version 2 of the AGS Format. Version 3 software may not be able to fully read data in Version 1 of the AGS Format, as there were some significant structural changes in the AGS Format between Versions 1 and 2. Software designed for Version 2 of the AGS Format will not be able to fully read a Version 3 data file.

A number of Group Headings in Version 3 of the AGS Format have been marked as "Deleted". These Headings should not be used, and have been retained solely to ensure backward compatibility with old data sets held in Version 2 of the AGS Format. Provision has been made in Version 3 for all "Deleted" Headings. They are either replaced by alternative Headings, or Headings in other existing Groups, or new Groups. Deleted Headings may be removed from future versions of the AGS Format and only referenced in a 'previous versions' section to provide information for those developing conversion routines.

The AGS Format will continue to develop in response to user's requirements. The AGS Format drafting committee intends to maintain backward compatibility to the immediately previous version, but can not guarantee full backward compatibility to earlier versions. Wherever possible the committee will give advance warning of significant format changes intended to be implemented in the next version. For example, in the current Version 3, it is announced that the CHEM and GAST Groups will be discontinued in the future Version 4, and that their use should be phased out, and replaced by the CNMT Group.

The availability of format conversion programs, to convert old data sets to the current version of the AGS Format, will be announced on the AGS web site at **www.ags.org.uk**.

5 The use of linked pairs of Groups

a) The AGS Format uses pairs of Groups to report some test results where the test can be divided into general information, and detailed data. The paired Groups are:

- CBRG and CBRT for CBR tests.
- CMPG and CMPT for compaction tests.
- CONG and CONS for consolidation tests.
- DPRG and DPRB for dynamic probe tests.
- MCVG and MCVT for MCV tests.
- PRTG and PRTL for pressuremeter tests.
- SHBG and SHBT for shear box tests.
- TRIG and TRIX for triaxial tests.

For each of these pairs, the first Group of the pair, with the 'G' suffix, is used to present the general information for the test and the overall test results. The second Group of the pair is used to present the detailed data for each stage of the test. The second Group includes a Key Field for stage number (or increment or point or loop number or depth etc). The first Group will always only have one line of data for each test, whereas the second Group will have several lines of data for each test. When reporting the results of these tests it is normal practice to include both Groups in order to report the test fully. However, if the detailed data is not required or not available, then the general Group may be reported on its own by agreement between the Provider and the Receiver (except for DPRG which gives only the dynamic probe equipment and no results). The detailed Group must not be provided without the general Group.

These paired Groups are handled readily by dedicated geotechnical relational database programs. However, they are not easily created or viewed using spreadsheets. If spreadsheets are being used, then care must be taken to ensure data integrity and the correct splitting and merging of the data when creating and viewing the AGS Format files.

If user defined Headings are added to these paired Groups, you should ensure that the Heading is added to the correct Group.

b) One exception to the paired Groups is the GRAD Group for particle size distribution analysis data. For this test the general information and detailed data have been combined into one table. If user defined Headings are added to this table for general items, such as percentage clay fraction, then this data must be repeated in the data set for every point on the grading curve. It is therefore, better practice to put such user defined general fields into another Group, for example into the CLSS Group.

c) A similar paired Group approach is adopted for monitoring test results, where a general Group is used to report the monitoring installation information and a detailed Group is used to report the monitoring test results. The paired Groups of this type are:

- HPGI and HPGO for horizontal profile gauge installations and readings.
- INST and IOBS for single point instrumentation installations and readings.
- PREF and POBS for piezometer installations and readings.
- PROF and PROB for profiling instrument installations and readings.

The first Group of the pair will always have only one line of data for each instrument, whereas the second Group of the pair will have many lines of data for the readings taken in that instrument. It is usual practice to present both Groups of the pair. However, if the instrument has been installed but no readings are available, then only the first Group need be presented. The second Group for readings must not be presented without the corresponding first Group for installation details.

For all of these instruments it is possible to have more than one instrument in a borehole, therefore Key Fields are required in both Groups of the pair to indicate which instrument is being referred to. These Key Fields are:

- The instrument reference number for horizontal profile gauges.
- The instrument depth and reference number for single point instruments.
- The piezometer tip depth for piezometers.
- The instrument reference number for profiling instruments.

These Key Fields must be reported for all installations and all readings otherwise data integrity is not satisfied.

The individual readings are identified by reading date and time and these must be recorded and reported. In addition for profiling instruments and horizontal profile gauges, each reading requires a depth or distance to identify it.

6 Reporting test units

A <UNITS> line must be included in every data Group except ABBR, CODE, DICT and UNIT. If you are creating or viewing an AGS Format file in a spreadsheet this line of information will be visible below the column Headings and should be carefully checked. Further checks are also required for the CNMT Group which handles test units in a different way from all other Groups.

a) All data Groups apart from CNMT

- Import the AGS file into a spreadsheet using the Comma Separated Value (CSV) import filter.
- If the <UNITS> continues onto a second line, you must first cut and paste the second line into the correct columns.
- Are the units lined up under the correct column Heading?
- Are the units the same as defined in the AGS Format? This is desirable, but it is not essential. For example the testing may have been carried out overseas, or to a different standard method and therefore different units may have been used. The same units must be used as given in the paper version of the report.
- Are the units correct for the data that is given beneath? Experience has shown that this is a common error.
- The units given in the <UNITS> line must be defined in the UNIT Group. Standard units are given in the ‘pick’ list in Appendix 1. Where standard units are used the format must comply exactly with that given in the ‘pick’ list in Appendix 1.
- If you are creating or viewing data in a dedicated geotechnical relational database program, the units embedded in the AGS data file may not be displayed by the program in all views of the data. The

program may assume that the units stated in the AGS Format have been used and display these units, rather than those in the AGS file. Similarly, when creating an AGS format file, the program may automatically generate the <UNITS> information, assuming the AGS default values, irrespective of the units actually used. There is therefore potential for significant systematic errors, which will only be avoided by careful checking by the data Provider and Receiver.

- Authors of dedicated geotechnical relational database programs should ensure that their software requires the data Provider to input the units, or confirm the default units, for each parameter. The program should also display the units as embedded in the received AGS file.

b) The CNMT Group

The procedure for checking the test units for chemical test results reported in the CNMT Group is different to that used for all other data Groups. The following points should be recognised:

- The <UNITS> line in the CNMT Group gives only the units of the SAMP_TOP and SPEC_DPTH fields (preferred units are "m").

- The <UNITS> line does not give the units of the test results and is left blank for CNMT_RESL (ie a null "" is given). The units of the test results are given in the CNMT_UNIT field of the CNMT Group for every test result. It is necessary to check the units for every test result, not just the <UNITS> line.

- The units used for a particular test should follow the appropriate testing standard that has been specified and should be agreed between the data Provider and Receiver. The AGS Format does not specify preferred units for the tests reported in the CNMT Group.

- The units used in the AGS Format submission should be the same as those used in the paper report.

- For each test type the same units should be used throughout an AGS Format submission. The units given in CNMT_UNIT for a given test type should not be different on different samples.

- If several partial data submissions are made, then the units for a given test type should remain the same.

- The units given in CNMT_UNIT must be defined in the UNIT Group. Standard units are given in the 'pick' list in Appendix 1. Where standard units are used the format must comply exactly with that given in the 'pick' list in Appendix 1.

c) The UNIT Group

All units used in an AGS Format submission must be defined in the UNIT Group; this includes standard units given in the 'pick' list in Appendix 1, and user defined units. The following guidelines should be followed for all units:

- Where standard units are used, the format must be exactly as given in the 'pick' list in Appendix 1. This is required so that computer software can be programmed to automatically recognise the units.

- User defined units must be composed of only standard ASCII characters. No non-ASCII or extended ASCII characters shall be used. For example, do not use the Greek mu symbol for 1/1000000, but instead use the abbreviation "u", e.g. ug/kg.

- Do not use any superscripted characters. For example do not use kN/m^2 but instead use kN/m2.

- The units are case sensitive, therefore ensure that you exactly match the case of the standard units and that you have the correct case for any user defined units. For example, the standard unit is kN/m2 and therefore KN/m2 or kn/m2 are not acceptable.

- Before creating new user defined units, consult the Discussion Forum of the AGS web site at **www.ags.org.uk** to see if anybody else has already suggested an appropriate style of presentation for the unit. If not, add details to the Discussion Forum of what you propose to do. The AGS Format committee will consider all suggestions posted in the Discussion Forum when preparing the next revision of the AGS Format. See Appendix 5 for further details.

7 Standard abbreviation 'pick' lists and user defined abbreviations

All abbreviations used within the AGS Format data files of a submission must be defined in the ABBR and CODE Groups, including the standard abbreviations given in the 'pick' lists in Appendix 1. Chemical test codes are defined in the CODE Group, and all other abbreviations are defined in the ABBR Group.

a) User defined abbreviations in the ABBR Group

The 'pick' lists in Appendix 1 define a set of standard abbreviations, and indicate which Headings they should be used in. The data Group definitions indicate the Headings for which 'pick' lists of abbreviations are available. Headings which are indicated to have 'pick' lists available can also contain text items which are not taken from the relevant 'pick' list. If an abbreviation is used, then it must come from the 'pick' list, or a user defined abbreviation must be created. If a standard abbreviation exists for an item, then the abbreviation should be used not a full text equivalent.

User defined abbreviations must be given in the ABBR Group and should follow these guidelines:

- User defined abbreviations should not duplicate an item for which a standard abbreviation is already given in the 'pick' lists.
- The abbreviation given in ABBR_CODE must not duplicate a code already given in the 'pick' lists for the same Heading. For example in the 'pick' lists "W" is given as an abbreviation for "Wash boring" in HOLE_TYPE, for "Water sample" in SAMP_TYPE and for "Water specimen" in SPEC_TYPE. "W" must not be used as a user defined abbreviation in any of these three Headings but could be used for other Headings, for example, as an abbreviation for "Well" in PREF_TYPE.
- ABBR_CODE should be considered as not case sensitive. Therefore "Cp" and "cp" are the same as the existing code "CP" and should not be used as a user defined abbreviation within HOLE_TYPE where "CP" is already defined in the 'pick' lists.
- ABBR_CODE should be restricted to the letters A to Z and the numbers 0 to 9 and should not contain spaces.
- The abbreviations should be agreed between the Provider and Receiver.
- All abbreviations must be defined in the ABBR Group including the standard abbreviations given in the 'pick' lists in Appendix 1, for example:

```
"**ABBR"
"*ABBR_HDNG", "*ABBR_CODE", "*ABBR_DESC"
"SAMP_TYPE", "M", "Mazier type sample"
"SAMP_TYPE", "VS", "Vial sample"
"SAMP_TYPE", "W", "Water sample"
"HOLE_TYPE","OWCP","Overwater cable percussion boring"
```

- Before creating new abbreviations, consult the Discussion Forum of the AGS web site at **www.ags.org.uk** to see if anybody else has already suggested an appropriate abbreviation. If not, add details to the Discussion Forum of what you propose to do. The AGS Format committee will consider all suggestions posted in the Discussion Forum when preparing the next revision of the AGS Format. See Appendix 5 for further details.

b) User defined chemical codes in the CODE Group

User defined chemical codes must be given in the CODE Group and should follow these guidelines:

- User defined chemical codes must not duplicate a standard code which is already given in the 'pick' lists.
- CODE_CODE should be considered as not case sensitive. Therefore "Tol" and "tol" are the same as the existing code "TOL" and should not be used.
- CODE_CODE must be restricted to the letters A to Z and the numbers 0 to 9 and must not contain spaces.
- The codes should be agreed between the Provider and Receiver.
- All codes must be defined in the CODE Group including the standard codes given in Appendix 1, for example:

  "**CODE"
  "*CODE_CODE","*CODE_DESC"
  "BIOXW","Biochemical oxygen demand"

- Before creating new codes, consult the Discussion Forum of the AGS web site at **www.ags.org.uk** to see if anybody else has already suggested an appropriate code. If not, add details to the Discussion Forum of what you propose to do. The AGS Format committee will consider all suggestions posted in the Discussion Forum when preparing the next revision of the AGS Format. See Appendix 5 for further details.

8 Geology and Legend Codes

The code Headings within the GEOL Group may be used as follows, although alternative applications are possible.

a) The geology code GEOL_GEOL may be used as an abbreviation for the Geological Name of each geological unit, for example:

RA as an abbreviation for Recent Alluvium
LC as an abbreviation for London Clay

User defined abbreviations or standard national abbreviations may be used. For example, in the United Kingdom the computer code given in the British Geological Survey lexicon of named rock units may be used (see the BGS web site at **www.bgs.ac.uk**).

b) The second geology code GEOL_GEO2 may be used as an abbreviation for the material type of each stratum, for example:

SC for Sandy CLAY
C for CLAY

c) The legend code GEOL_LEG is an abbreviation for the legend pattern used for each stratum on the borehole logs, and may be used in one of two different ways:

- The code may be the abbreviation or legend pattern reference number used internally by the Provider's software, for example:

  124 for Sandy CLAY
  100 for CLAY

- Or the code may be some meaningful abbreviation for the material type of each legend pattern, for example:

  SC for Sandy CLAY
  C for CLAY

  In this case GEOL_LEG and GEOL_GEO2 could be the same, although this is not necessarily the case. For example, GEOL_GEO2 may use different codes to distinguish between "soft CLAY" and "stiff CLAY", whereas the equivalent GEOL_LEG for both strata would indicate "CLAY".

d) The stratum code GEOL_STAT may be used as the reference letter or number of each stratum on a trial pit log. Its sole purpose is to link the stratum shown on the face sketch of the trial pit to the stratum description given elsewhere on the log. It is therefore not used on borehole logs and it is not used on simple trial pit logs which are presented in borehole log format, without a face sketch. GEOL_STAT is usually just the numbers 1, 2, 3 etc or the letters A, B, C etc.

GEOL_STAT also appears in the SAMP Group and several of the insitu testing Groups so that it is possible to indicate which stratum on a trial pit face a sample was taken from, or an insitu test carried out in.

e) The way that GEOL_GEOL, GEOL_GEO2, GEOL_LEG and GEOL_STAT are used should be agreed between the Provider and the Receiver.

f) All GEOL_GEOL, GEOL_GEO2 and GEOL_LEG codes must be defined in the ABBR Group (see Section 7 above), for example:

```
"**ABBR"
"*ABBR_HDNG","*ABBR_CODE","*ABBR_DESC"
"GEOL_GEOL","RA","Recent Alluvium"
"GEOL_GEOL","LC","London Clay"
"GEOL_GEO2","SC","Sandy CLAY"
"GEOL_GEO2","C","CLAY"
"GEOL_LEG","124","Sandy CLAY"
"GEOL_LEG","100","CLAY"
```

9 Associated files

Data may be included in an AGS compatible submission for items that are not covered by the AGS Format by including the data in an associated file and referencing it in the AGS Format. The associated files may be in any file format that is acceptable to the Provider and Receiver. It is preferable that associated files are not compressed, however, large files that will not fit on to a single disk may be compressed using the ZIP file format. Zipped files must indicate the original file format plus the zipped file format. Compressed files should only be used in agreement between the Provider and Receiver. The AGS Format files in a submission should not be compressed.

All associated files must have an up to 8 character file name and a 3 character file type extension. Long file names must not be used.

The referencing procedure is in two parts:

a) The associated data files are collected together into data sets. Each data set must have a unique reference number and this reference number is given in the FILE_FSET field of the relevant Group as follows:

- General data files that refer to the whole site should be collected together in a file set that is referenced in the FILE_FSET field of the PROJ Group. Such data files may include the report text as a word processor file, the site plan as a CAD file, a set of general site photographs as JPG files or the investigation Bill of Quantities as a spreadsheet file. For example:

```
"**PROJ"
"*PROJ_ID","*PROJ_NAME","*PROJ_LOC","*PROJ_DATE","*PROJ_AGS","*FILE_FSET"
"<UNITS>","","","dd/mm/yyyy","",""
"7845","Trumpington Sewerage","Trumpington","28/05/1999","3","FS1"
```

- Data files that refer to specific boreholes or trial pits should be collected together in a file set that is referenced in the FILE_FSET field of the HOLE Group. Such data files may include a set of borehole geophysics files in LAS format, the trial pit photographs as JPG files, or a detailed location plan as a CAD file. It is recommended that core photograph files are collected together as part of the FILE_FSET in the HOLE Group, rather than being placed in the CORE Group, as each core box generally contains more than one core run.

```
"**HOLE"
"*HOLE_ID","*HOLE_TYPE","*HOLE_NATE","*HOLE_NATN","*HOLE_GL", "*FILE_FSET"
"<UNITS>","","m","m","m",""
"BH1","CP+RC","532154","176163","78.4","FS2"
"TP2","TP","532246","176047","64.9","FS3"
```

- Data files that refer to specific samples should be collected together in a file set that is referenced in the FILE_FSET field of the SAMP Group. Such data files may include close up fabric photographs of a split piston sample as JPG files, or the text of a separate report on the petrographic analysis of an aggregate bulk sample as a word processor document.

```
"**SAMP"
"*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SAMP_TYPE","*FILE_FSET"
"<UNITS>", "m","","","",""
"BH1","2.50","5","P","FS205"
"TP2","3.50","3","B","FS314"
```

- Data files that refer to specific tests should be collected together in a file set that is referenced in the FILE_FSET field of the relevant test results Group. Such data may include close up photographs of a shear box sample after failure as a JPG file referenced in the SHBG Group, or a spreadsheet file of the detailed results and calculations of an insitu permeability test referenced in the IPRM Group. Where Groups occur as linked pairs (see Section 5) the file set should be referenced in the general Group of the pair.

b) The contents of each file set are described in the FILE Group. The File Name within each File Set must be unique, so that the combination of the Key Fields of FILE_FSET and FILE_NAME is unique.

```
"**FILE"
"*FILE_FSET","*FILE_NAME","*FILE_DESC","*FILE_TYPE","*FILE_PROG", "FILE_DATE"
"<UNITS>","","","","","dd/mm/yyyy"
"FS1","trumptxt.doc","Factual report text","DOC","Word 97","27/05/1999"
"FS1","trumpsi.zip","Site plan","DWG+ZIP","AutoCAD ver 14 + PKZip ver 2.04g","24/05/1999"
"FS1","trump011.jpg","Photo of site looking North","JPG","Paintshop Pro ver 5","02/05/1999"
"FS1","trump021.jpg","Photo of site looking South","JPG","Paintshop Pro ver 5","02/05/1999"
"FS1","trumpboq.xls","Final BOQ","XLS","Excel 97","27/05/1999"
"FS2","bh1geoph.zip","BH1 geophysics","LAS+ZIP","GLog ver 3 + PKZip ver 2.04g","02/05/1999"
"FS2","bh1p01.jpg","BH1 core photo box 1","JPG","Paintshop Pro ver 5","09/05/1999"
"FS2","bh1p02.jpg","BH1 core photo box 2","JPG","Paintshop Pro ver 5","09/05/1999"
"FS2","bh1plan.dwg","BH1 location plan","DWG","AutoCAD ver 14","06/05/1999"
"FS3","tp2p01.jpg","TP2 photo north face","JPG","Paintshop Pro ver 5","02/05/1999"
"FS205","bh1p26.jpg","BH1 sample P5 split piston","JPG","Paintshop Pro ver 5","09/05/1999"
```

"FS314","tp2pet1.doc","TP2 sample B3 petrographic report text","DOC","Word 97","21/05/1999"

10 Geophysical data

The AGS Format does not cater for geophysical data (other than resistivity) as there are already well established international standards for the digital exchange of geophysical data.

a) The most widely used standards are:

- LAS (Log ASCII Standard). Originated by the Canadian Well Logging Society for the interchange of geophysical wireline logs in a simple ASCII format on floppy disc.
- LIS (Log Information Standard) and DLIS (Digital Log Interchange Standard). LIS was originated by Schlumberger for the interchange of geophysical wireline logs. It has been largely superseded by DLIS developed by the American Petroleum Institute, but now maintained by the Petrotechnical Open Software Corporation. DLIS is also known as POSC RP66. These are more complete and complex formats than LAS, and were designed for magnetic tape use.
- SEGY (Society of Exploration Geophysicists Y Format) for the exchange of seismic data. This is a tape based format.
- Refer to the AGS web site at **www.ags.org.uk** for internet links to further information on these interchange formats. Of the above, LAS is the only one that is suitable for a submission on floppy disc, the others require magnetic tape.

b) To include associated geophysical data files in any of the above formats in an AGS Format compatible submission:

- For borehole wireline geophysical logs reference the data set of geophysical files under the FILE_FSET Heading of the relevant borehole in the HOLE Group. Detail all the files contained within the data set in the FILE Group (see Section 9 above).
- For surface geophysical data sets (seismic, gravity etc) give a unique HOLE_ID in the HOLE Group for each data run, profile or point and then reference the data set of files under the FILE_FSET Heading of the HOLE Group. If the data set covers a linear run or profile then give the start and end co-ordinates of the line using the HOLE_NATE, HOLE_NATN, HOLE_ETRV and HOLE_NTRV Headings. The ground levels of the start and end of the line should be given using the HOLE_GL and HOLE_LTRV Headings. Detail all the files contained within the data set in the FILE Group (see Section 9 above).
- For insitu resistivity profile data use the IRES Group of the AGS Format.

11 Amalgamated samples

It may be necessary to amalgamate two or more samples for laboratory testing. The samples may come from the same, or different, boreholes or trial pits. The procedure for reporting tests on these samples is given below:

- All the original samples (before amalgamation) must be detailed in the SAMP Group with their original borehole/trial pit numbers, depth, sample type and sample number.

- Then select one of the group of samples to be amalgamated as the "Primary sample" and put a duplicate entry for it into the SAMP Group, but change the sample type to AMAL. In the SAMP_REM field list all the samples that have been amalgamated to create this one combined sample. Include in the list the sample used as the "Primary sample". The format of the SAMP_REM list should be as follows:

  HOLE_ID , SAMP_REF , SAMP_TYPE , SAMP_TOP units of SAMP_TOP +
  HOLE_ID , SAMP_REF , SAMP_TYPE , SAMP_TOP units of SAMP_TOP etc

  For example:

  "**SAMP"
  "*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SAMP_TYPE","*SAMP_REM"
  "<UNITS>", "m","","","",""
  "TP1","2.50","1","B",""
  "TP2","3.50","3","B",""
  "TP2","4.50","5","B",""
  "TP2","3.50","3","AMAL","TP1,1,B,2.50m+TP2,3,B,3.50m+TP2,5,B,4.50m"

- All amalgamated samples must be defined in SAMP before test results can be given elsewhere.

- In reporting test results on the amalgamated sample in other Groups, use the "Primary sample" details with the sample type as AMAL.

12 The use of DREM and DETL

The Groups DREM and DETL both include detailed information for inclusion on the borehole or trial pit log. Guidance on the use of these two Groups is given below, but alternative usages are possible.

a) Group DETL may be used for adding geological details to the geological description of a stratum.

- A geological description in DETL_DESC should be considered as a supplement to the main stratum description given in GEOL_DESC of the GEOL Group.

- Detailed descriptions should be given a top and bottom depth if the feature has thickness. For example, "19.30 to 19.60m Sandstone boulder".

- Detailed descriptions should be given a single depth (which is repeated in both the DETL_TOP and DETL_BASE fields), only if it has no significant thickness, or if it marks the top of a gradational change in the nature of the stratum. For example, "27.65m Marl parting" or "35.65m Becoming very sandy".

- If the change in the stratum is not gradational it is generally preferable to give depth ranges. For example, "6.50 to 8.70m Sandy", is generally preferable to "Sandy below 6.50m".

- The depth or depth range of the detailed feature may be repeated within the description if it is to be printed on the log.

- Since the detailed descriptions are a supplement to the main description, detailed description depth ranges should not cross main stratum boundaries.

b) Group DREM may be used for all remarks and notes that are related to a specific depth in the borehole or trial pit, that are not geological.

- DREM is used for reporting incidents during drilling (such as "Fishing for broken U100 3.00 to 3.70m"), drilling records that don't readily fit in any other tables (such as "Pushing boulder ahead of casing 7.80 to 8.15m"), observations that are not strictly geological (such as "Strong petrol smell at 5.00m").

- DREM only contains a single depth field. So if the feature or incident being reported applies over a depth range, then the top and base depths should be given within the text of the remark. The depth given in DREM_DPTH should be the top depth of the range.

13 Reporting trial pits

Simple trial pits where the geology is treated as horizontal, continuous layers can be reported in a borehole type log, which is a one dimensional record of the ground conditions, the only dimension being depth. These logs readily convert into the AGS Format.

For more complex trial pits where the geology is not in horizontal, continuous layers, the log will normally include a (two dimensional) sketch of the faces to show the disposition of the strata, and the location of the samples and insitu tests. The stratum descriptions will be referenced to the sketch. Such trial pit logs require some compromises to convert them to a one dimensional borehole log in order to report them in the AGS Format. The following procedure may be used, but alternative methods are possible.

- On the face sketch give each stratum a stratum code number or letter. This is used to link the sketch to the stratum description, and is recorded as GEOL_STAT.

- In your log production software produce a (one dimensional) borehole style log. The stratum code GEOL_STAT should be prominently displayed at the start of, or adjacent to, each stratum description. The strata should be presented in the same vertical sequence that they are seen in the trial pit faces. The stratum boundary depths on this log should be "approximate average depths" for each stratum boundary, as seen in the trial pit faces. This may be difficult to achieve where the strata boundaries are complex. However, every stratum must be included in the depth log, with some nominal thickness, and there must be no gaps in the log. Where strata are very limited in extent they could be included as a detail in the DETL Group, rather than as a separate stratum in the GEOL Group.

- Samples are recorded in the SAMP Group as normal, but also include the stratum code in GEOL_STAT of the SAMP Group to indicate which stratum the sample has been taken from. If you also wish to indicate which face of the trial pit the sample was taken from, then include this as a remark in SAMP_REM.

- Insitu CBR, density, redox, resistivity and vane tests can be carried out in a trial pit, rather than at the ground surface. The tests should be recorded in the relevant Group as normal, but also include the stratum code in GEOL_STAT of the Group to indicate which stratum the test was carried out in. If required, the trial pit face number should be given in the REM field of the Group.

- If the face sketch has been produced on computer software, then this could be included in the AGS file as an associated file (see Section 9 above), and referenced in the FILE_FSET field of the HOLE Group for the trial pit.

14 Reporting SPT tests

The following guidelines may be applied to the reporting of SPT tests in the ISPT Group, but alternative usages are possible.

- When full test penetration of 450mm has been achieved the N value should be reported in the ISPT_NVAL field as a number. That is, report 35, do not report N=35.

- When full test penetration has not been achieved, then leave the ISPT_NVAL field empty.

- In the ISPT_REP field put the test result as reported on the paper borehole log. This may be in a format specific to the Provider. For example, an N Value of 35 may be reported on the log as: 35, N=35, [35] or 3,5/9,7,9,10=35 etc. An incomplete test may be reported on the log as: 50/160mm, 50/160, (50) or 8,10/15,12,23 for 10mm etc.

- The ISPT_INC1, ISPT_INC2, ISPT_PEN1 and ISPT_PEN2 fields should only be used for reporting the seating drive. If the seating drive is terminated during the first increment (as BS1377 permits in certain circumstances), then ISPT_INC2 and ISPT_PEN2 are left blank. The first increment of the main test drive is always reported in ISPT_INC3 and ISPT_PEN3.

- In some countries the test procedure requires three increments of 150mm each, rather than six increments of 75mm each. If this procedure is adopted, then report the increments in ISPT_INC1, ISPT_INC3 and ISPT_INC5, and the corresponding ISPT_PEN fields.

15 Reporting chemical test results

Routine chemical testing for geotechnical purposes is carried out in accordance with BS1377. Results of these tests may be reported in the CHEM Group or in the CNMT Group. However, attention is drawn to the AGS's intention to discontinue the use of the CHEM Group in the next version of the AGS Format, and it's use should therefore, be phased out. Similarly, gas chemical tests may be reported in the GAST Group or in the CNMT Group. The GAST Group will be removed in the next version of the AGS Format and it's use should be discontinued.

Chemical tests carried out for geo-environmental purposes, to standards other than BS1377, are reported using the CNMT Group. The CNMT Group has a structure that is different from all the other Groups in the AGS Format. The reported tests are identified by a code which is defined in the 'pick' lists in Appendix 1. The codes used must be defined in the CODE Group, as described in Section 7 above, even if standard codes defined in Appendix 1 are being used.

There has been a change in the way that the codes are used between Version 2 and Version 3 of the AGS Format. In Version 2 the codes were often a combination of determinand and test type; therefore, there were several different codes for sulphate tests carried out on soil or water samples, and by different test methods. In Version 3 the codes used in CNMT_TYPE and defined in CODE_CODE solely indicate the determinand, and therefore, there is now a single code for sulphate (SULWS). In addition to the CNMT_TYPE code, a test type code must be used in CNMT_TTYP and defined in ABBR_CODE, which distinguishes between the different types of sulphate test. CNMT_TYPE and CNMT_TTYP are both KEY fields and must be included for every test result. Further information may optionally be given on the test method and sample preparation method in CNMT_METH and CNMT_PREP. Examples of the use of these four fields are given below:

Version 3				Version 2 equivalent
CNMT_TYPE	**CNMT_TTYP**	**CNMT_METH**	**CNMT_PREP**	**CNMT_TYPE**
SULWS	WATER		Filtered	SULAW
SULWS	SOLID_21WAT	2:1 soil/water extract	Air dried	SULWS
SULWS	SOLID_TOT	BS1377 Acid extract	Oven dried	SULTS

The results of the chemical tests are given in the CNMT_RESL field, and the units of each result must be stated in the CNMT_UNIT field. The abbreviations for the units must be defined in the UNIT Group (see Section 6 above).

The AGS wishes to promote the wider adoption of CAS numbers (Chemical Abstracts Service registry numbers), which uniquely identify many chemical compounds. The separation of determinand code and test type code in Version 3 of the AGS Format is compatible with the approach of the CAS number system. However, CAS numbers are not available for all the determinands listed in Appendix 1, and therefore CAS numbers may be used to supplement the CNMT_TYPE codes, but not replace them. CAS numbers may be included in the CNMT_CAS field. References to further information on CAS numbers are given on the AGS web site at **www.ags.org.uk**.

16 Reporting linear traverse, scanline or slope strip logs

The AGS Format can handle the reporting of logs of linear traverses (eg of a quarry face or foundation excavation), or scanline logs (eg for a detailed rock discontinuity survey) or a slope strip log (where the surface protection is stripped off a cutting face to log the underlying geology). Geological logging, discontinuity logging, sampling and insitu testing can all be included using the following guidelines.

a) The location and orientation of the traverse is recorded in the HOLE Group. The traverse should be given a unique reference number in HOLE_ID. The HOLE_TYPE is TRAV (for a traverse or scanline) or CH (for a surface slope protection strip). The co-ordinates of the start of the traverse are given in HOLE_NATE, HOLE_NATN and the co-ordinates for the end are given in HOLE_ETRV and HOLE_NTRV. The level of the start of the traverse is given in HOLE_GL and the level of the end is given in HOLE_LTRV. The compass bearing of the traverse is given in HOLE_ORNT and the inclination of the traverse line from the horizontal is given in HOLE_INCL (eg 0 deg for a horizontal scanline, or 90 deg for a vertical slope strip).

b) Strata boundaries, weathering divisions, discontinuities, samples and insitu test locations are measured along the length of the traverse from the start for a subhorizontal traverse and down the traverse from the top for a subvertical traverse. These measurements are then entered as depths in the appropriate AGS fields (eg GEOL_TOP, GEOL_BASE, WETH_TOP, WETH_BASE, DISC_TOP, DISC_BASE, SAMP_TOP, IVAN_DPTH etc).

17 Reporting discontinuity logging data

Discontinuity logging may be carried out as part of a scanline survey of a rock face, or as a detailed fracture log of borehole core.

a) The logging may take one of three forms, the first two being the commonest:

- The recording of the nature of individual discontinuities. All discontinuity descriptions are given in the DISC Group. The FRAC Group is not used. The spacing between individual discontinuities may be assessed from their depths.
- The recording of the typical nature of sets of discontinuities. The typical description for a discontinuity set is given in the DISC Group and the typical spacing is given in the FRAC Group. Individual discontinuities are not described.
- The recording of the nature of individual discontinuities, with each discontinuity assigned to a discontinuity set. The individual discontinuity descriptions are given in the DISC Group and the typical spacing of a discontinuity set is given in the FRAC Group.

b) If individual discontinuities have been logged along a scanline or in a borehole, then the reporting procedure is as follows:

- The nature of the individual discontinuities is recorded in the DISC Group.
- The location of each discontinuity is given in DISC_TOP, either as depth in a borehole, or as distance from the start of the traverse along a scanline. The DISC_BASE field is left empty.
- Each discontinuity is numbered sequentially in DISC_NUMB from the top of the borehole, or from the start of the traverse.
- If each discontinuity has been assigned to a discontinuity set, then the set reference number should be given in FRAC_SET (see Section 17c below). The use of FRAC_SET is optional when individual discontinuities are logged.

- The orientation and nature of each discontinuity is reported using the remaining fields in DISC. The descriptive scheme is derived from the ISRM (1978) Suggested methods for the quantitative description of discontinuities in rock masses. International Journal of Rock Mechanics and Mining Science. Volume 15. No 6 pp 319-368.

- For borehole logs the surface nature of the discontinuity is described using a combination of DISC_RGH, DISC_PLAN, DISC_JRC, DISC_APP, DISC_STR and DISC_WETH. It is generally not reliable to measure the aperture of a discontinuity in borehole core as the effect of drilling disturbance is unknown. However, the thickness of any discontinuity infill should be given in DISC_APT, and the nature of the infill given in DISC_INFM. Discontinuity dip can be given in DISC_DIP for vertical boreholes, and inclined boreholes with orientated core. Discontinuity dip direction can only be given in DISC_DIR if the core is orientated. In an inclined borehole with unorientated core only relative discontinuity dip can be given with respect to the core axis.

- For scanline logs all the above details of discontinuity orientation and nature can be given, together with the large scale waviness, true discontinuity aperture, discontinuity termination (using the terms given in the 'pick' list in Appendix 1), and water seepage observations.

- The format of the DISC Group is applicable to most descriptive schemes, other than ISRM (1978). Alternative schemes may be used on agreement between the Provider and Receiver.

c) If sets or zones of discontinuities have been logged along a scanline or in a borehole, then the reporting procedure is as follows:

- The discontinuity sets or zones are recorded in a combination of the DISC and FRAC Groups. The DISC Group is used to record either the typical orientation and nature of each set or zone of discontinuities, or the individual discontinuities. The FRAC Group is used to record the spacing of the discontinuities in each set or zone.

- The start and end of each set or zone of discontinuities of similar nature is given in DISC_TOP and DISC_BASE, either as depth in a borehole, or as distance from the start of the traverse along a scanline. The start and end of each set or zone of discontinuities with a similar spacing is given in FRAC_TOP and FRAC_BASE. Normally the "nature" and "spacing" zones will coincide, and therefore DISC_TOP and DISC_BASE will be the same as FRAC_TOP and FRAC_BASE.

- DISC_NUMB is left blank when logging discontinuity sets or zones.

- Each discontinuity set or zone must be given a unique set reference number in FRAC_SET. For example, joint sets may be numbered J1, J2, J3 etc, bedding discontinuities as B1, B2 etc. The use of FRAC_SET provides the link between the DISC and FRAC Groups.

- The typical orientation and nature of each discontinuity set or zone is reported using the remaining fields in DISC.

- The spacing of the discontinuities within each discontinuity set or zone is reported in the FRAC Group, giving the minimum, average (typical), and maximum spacing in mm of the fractures in that set or zone, using the FRAC_IMIN, FRAC_IAVE and FRAC_IMAX fields. Alternatively, the average (typical) number of fractures per metre can be given in FRAC_FI.

18 Reporting insitu tests not carried out in a borehole or trial pit

Insitu tests are mostly carried out in boreholes or trial pits, but this is not always the case, and some tests can be carried out on their own, from the surface, without a borehole or trial pit.

a) The tests that can be carried out from the surface are:

- In situ CBR test reported in Group ICBR
- In situ density test reported in Group IDEN
- In situ redox test reported in Group IRDX
- In situ resistivity test reported in Group IRES
- In situ vane test reported in Group IVAN

Static cone and dynamic probe tests are treated in the same way as boreholes.

b) Where these tests are carried out from the surface the following reporting procedure should be used:

- Each test should be given its own unique HOLE_ID.
- In the HOLE Group the HOLE_ID of each test is given, together with its co-ordinates and ground level. Under the HOLE_TYPE Heading the abbreviation given in the 'pick' list in Appendix 1 should be used. For example:

```
"**HOLE"
"*HOLE_ID", "*HOLE_TYPE", "*HOLE_NATE", "HOLE_NATN", "*HOLE_GL"
"<UNITS>","","m","m","m"
"ID124","IDEN","521356","176478","34.6"
"ID125","IDEN","521364","176459","38.3"
"IC063","ICBR","521357","176477","34.5"
```

- The test results are reported in the appropriate Group as normal, but using the unique HOLE_ID defined in the HOLE Group. For example:

```
"**IDEN"
"*HOLE_ID", "*IDEN_DPTH", "*IDEN_IDEN", "*IDEN_MC", "*IDEN_REM"
"<UNITS>", "m", "Mg/m3", "%", ""
"ID124","0.00","1.75","17","Sand replacement. Test at ground level"
"ID125","0.00","1.73","15","Sand replacement. Test at ground level"
```

19 User defined Headings and Groups

The AGS Format contains Groups and Headings covering all the common investigation techniques and tests. However, if you find that you have carried out some work that is not covered by the Format it is possible to customise the Format to include your additional requirements.

a) Any additions you make should use these guidelines:

- If the AGS Format already includes the Headings you want to use, but you would prefer them to be in a different Group, for example, because your laboratory test results spreadsheet includes both index test results and chemical test results. Do not change the AGS Format to fit your software. Instead, change your software, or write a conversion routine to output the data in correct AGS Format.
- If you need to add some additional Headings, try to put them into an existing AGS Group, rather than create a new Group for them.
- If your new Headings do not readily fit into an existing Group, then you may create a new Group. Follow the same structure as the majority of the existing Groups in the AGS Format. Do not use the structure of the CNMT Group, which is different from all the other AGS Groups, and requires specific program code in the Receivers software to handle it.
- If you are adding Groups to handle a test that has both an overall test result, and detailed data for multiple points within the test, use a linked pair of tables (see Section 5 above).
- Any new Headings or Groups created should be specifically agreed between the Provider and Receiver.
- Do not create a new Group which only has PROJ_ID as the Key Field. Instead, add new Headings to the PROJ Group.
- Do not create a new Group which only has HOLE_ID as the Key Field. Instead, add new Headings to the HOLE Group.
- Do not create a new Group which only has HOLE_ID, SAMP_TOP, SAMP_REF and SAMP_TYPE as the Key Fields. Instead, add new Headings to the SAMP Group.

- If the new Group you propose to create has the same Key Fields as an existing Group, consider whether it is possible to add new Headings to the existing Group, rather than creating a new Group.

b) When creating a new Group, the most important aspect is to get the right Key Fields for the Group. Most new Groups should fit into one of the following four formats:

- Insitu test results should have Key Fields of HOLE_ID and a depth field.

- Laboratory test results should have Key Fields of HOLE_ID, SAMP_TOP, SAMP_REF, SAMP_TYPE, SPEC_REF and SPEC_DPTH.

- In linked pairs of Groups for laboratory test results the general Group should have Key Fields of HOLE_ID, SAMP_TOP, SAMP_REF, SAMP_TYPE, SPEC_REF and SPEC_DPTH. In the Group for the detailed test results the Key Fields should be HOLE_ID, SAMP_TOP, SAMP_REF, SAMP_TYPE, SPEC_REF, SPEC_DPTH plus test stage number.

- In linked pairs of Groups for monitoring readings, the Group for the instrument installation information should have Key Fields of HOLE_ID, instrument depth and/or reference number. In the Group for the detailed monitoring readings the Key Fields should be HOLE_ID, instrument depth and/or reference number plus date and time.

- If your new Group does not satisfy one of the above patterns of Key Fields, then review your database structure very carefully, it should probably be changed.

c) Before adding a new Heading or Group consult the Discussion Forum of the AGS web site at **www.ags.org.uk**, to see if anybody else has already suggested a solution to your requirements. If not, then add details to the Discussion Forum of what you propose to do. The AGS Format committee will consider all suggestions posted in the Discussion Forum when preparing the next revision of the AGS Format.

See Appendix 5 for further details on the AGS web site.

d) To add a new Heading to an existing Group.

- Define the new Heading in the DICT Group. Indicate whether the new field is a KEY field or a COMMON field. For example, to add a new field for corrected SPT N value to the ISPT group, create the following line in the DICT Group.

```
"**DICT"
"*DICT_TYPE", "*DICT_GRP", "*DICT_HDNG","*DICT_STAT", "*DICT_DESC", "*DICT_UNIT", "*DICT_EXMP"
"HEADING","ISPT","ISPT_CORN","COMMON","Corrected N value"," ","20"
```

- Add the new Heading to the existing Group, together with its data. The new Heading contains the prefix *?

```
"**ISPT"
"*HOLE_ID", "*ISPT_TOP", "*ISPT_SEAT", "*ISPT_MAIN", *ISPT_NPEN", "*ISPT_NVAL", "*?ISPT_CORN"
"<UNITS>","m","","","mm","",""
"BH1A","2.00","10","14","450","14","14"
"BH1A","3.00","13","21","450","21","18"
"BH1A","4.00","8","18","450","18","16.5"
"BH1A","4.00","16","32","450","32","23.5"
```

e) To add a new Group and Headings.

- Define the new Group and its new Headings in the DICT Group. For example, to define a new Group for plate loading test results.

```
"**DICT"
```

```
"*DICT_TYPE", "*DICT_GRP", "*DICT_HDNG", "*DICT_STAT","*DICT_DESC", "*DICT_UNIT", "*DICT_EXMP"
"GROUP","PLTT","","","Plate loading test results","",""
"HEADING","PLTT","HOLE_ID","KEY","Test location number","","PLT01"
"HEADING","PLTT","PLTT_DPTH","KEY","Test depth","m","2.55"
"HEADING","PLTT","PLTT_DIAM","COMMON","Plate diameter","m","0.95"
"HEADING","PLTT","PLTT_INTE","COMMON","Initial loading modulus","MN/m2","55.6"
"HEADING","PLTT","PLTT_UNRE","COMMON","Unload/reload modulus","MN/m2","127.4"
"HEADING","PLTT","PLTT_REM","COMMON","Notes","","Maintained load test."
```

- Create the new Group. The Group name contains the prefix **? and add the new Headings with the corresponding data. Each new Heading contains the prefix *?

```
"**?PLTT"
"*?HOLE_ID", "*?PLTT_DPTH", "*?PLTT_DIAM", "*?PLTT_INTE", *?PLTT_UNRE", "*?PLTT_REM"
"<UNITS>","m","m","MN/m2","MN/m2",""
"PLT15","0.50","0.95","4.76","11.8","Maintained load test"
"PLT15","1.60","0.95","62.6","178","Maintained load test"
"PLT15","3.40","0.95","137","279","Maintained load test"
```

20 Text formatting, fonts and special characters

a) Text formatting

The AGS Format is designed to transfer only the geotechnical and geoenvironmental data. It is not intended to transfer any formatting of the data. If your data includes any formatting it will either be lost, or could cause problems to the Receiver. To minimise such problems use the following guidelines.

- When entering data into your software, do not add any formatting in the data. Let your software control formatting of the output.
- Do not use Tabs to horizontally position your data.
- Do not use multiple spaces to horizontally position your data.
- Do not use multiple carriage returns to vertically position your data.
- Do not embed columns or tables in your data.
- Ensure that your software does not output any formatting or format control codes when creating an AGS Format file.

b) Fonts

The AGS Format does not transfer any font information. Use the following guidelines:

- When entering data into your software do not add any font information, let your software control fonts within its in-built output formatting.
- Do not use bold, italic or underline in your data.
- Do not use superscripted or subscripted numbers. For example, use MN/m3 and CaCO3.
- When entering data in Scientific Notation, do not use 10 to the power something, but use the exponent format eg 6.1E-6.
- Ensure that your software does not output any font information or font control codes when creating an AGS Format file.

c) Special characters

Rule 1 of the AGS Format Rules states that the extended ASCII character set must not be used. The extended character set includes characters such as accented letters, Greek letters and symbols. The way that extended characters are displayed in your software may depend on the language setting of your operating system, the code page set up, the font you are using and your printer set up. The results can be unpredictable, with either the wrong character being displayed, or no character being shown. The Rules therefore require you to avoid the extended ASCII character set. Some suggestions follow:

- When typing an angle, do not use the degree symbol, but use "deg" instead eg 45 de.g.
- When entering units do not use the superscripted 2 or 3, but use a normal 2 or 3 instead eg kN/m2.
- When entering units do not use the Greek mu symbol for 1/1000000, but instead use the abbreviation "u". e.g. ug/kg.
- Do not use accented letters.
- Do not use the special mathematical or copyright symbols, but replace them with composites made from the standard keyboard symbols, or with words.

  E.g. Greater than or equal to: >=
  Plus or minus: +/-
  Approximately: approx
  Copyright: (c)
  Trade Mark: (TM)
  Registered TradeMark: (R)

- Do not use any characters or symbols that are not on your keyboard or that require you to use an "Insert symbol" option in your software.

21 Declaration of AGS Format data files

The AGS wishes to encourage data Providers to declare on their paper reports when the data contained within the report is also available in AGS Format. This will become of considerable benefit to third party Receivers, who are not the primary Receivers that commissioned the report. To this end the AGS provides the following AGS Format logo to Registered Users of the Format.

The logo should be used as follows:

- The logo should be included in a prominent position on the front cover, or inside front cover, of the Factual Report to indicate that the data contained within the report has also been provided to the primary Receiver in AGS Format.
- The logo should also be included on every log within the report, as logs are frequently separated from the main text of the report.
- The logo is only to be used by Registered Users of the Format. A list of Registered Users is given on the AGS web site at **www.ags.org.uk**.

APPENDIX 7

Summary of Amendments Contained within AGS Format Edition 3

Introduction

This Appendix outlines the amendments that have been made in the Third Edition of the AGS Format. Full backward compatibility to the second edition has been maintained. However, there are a limited number of instances where an item has remained in this edition for backward compatibility only, but will be deleted from future editions.

Changes to Data Groups and Fields are highlighted throughout Section 11. These are not discussed in detail in this section. The amendments covered below relate to general changes only.

Amendments contained within the Third Edition

Introductory text

Revisions to wording. New section on User Support added.

Rules

New rules 6a, 6b, 6c, 20, 21, 22, 23, 24 and 25 added. Minor changes to other rules. Notes on rules revised accordingly. Group Hierarchy section added.

Data Dictionary

New Groups ABBR, CDIA, CHIS, CODE, DICT, DISC, DPRG, FILE, FLSH, UNIT and WETH added. Groups CHEM and GAST marked for future deletion. ROCK Group expanded. Other groups revised and updated.

Appendix 1

In previous editions example lists of abbreviations were given for hole types and sample types etc. These have been formalised as 'pick' lists of standard abbreviations. It is intended that these be added to on a regular basis depending on industry needs.

The list of chemical test determinands has been substantially modified.

A 'pick' list of standard units has been added.

Appendix 2

A new example file including examples of some of the new Groups and Fields has been incorporated.

Appendix 3

References to magnetic media are removed to allow all forms of transfer media including email.

Appendix 4

Specification and notes for guidance revised in accordance with the changes to the rest of the document.

Appendix 5

New appendix added to describe the change to Internet access and download facilities. Access to Discussion Boards and notification of future amendments has been incorporated.

Appendix 6

New appendix added to provide guidance to new and experienced users of the AGS Format.

Appendix 7

This appendix added.