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THE STANDARD FOR REPORTING THE RESULTS OF A DISSIPATION TEST IN THE GEOTECHNICAL EXCHANGE FORMAT (GEF)

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1 PURPOSE

The purpose of this document is to specify the standard for reporting the results of a dissipation test in the Geotechnical Exchange Format (GEF). A GEF report is the shape in which results of tests are being exchanged between client and producer. CUR committee E12 has reached an agreement on reporting the results of a dissipation test. Such a report allows for an integrated approach in which a client can incorporate the results of dissipation tests of different companies, without the need for coping with problems regarding data compatibility. Moreover the standard is a kind of checklist for a minimum subset of data.

In an earlier stage the parties which participated in CUR committee E12, have reached an agreement on reporting the results of cone penetration test, GEF-CPT-report, see [CUR 1999]. The format of reporting results is the GEF. More details about GEF can be found on the world wide web: http://www.geonet.nl

In this document the guidelines on reporting dissipation tests using the Geotechnical Exchange Format are given. Additionally examples are given.

2 BACKGROUND

The dissipation test is carried out during a standard cone penetration test, CPT for short. Penetration is temporarily halted, while the pore pressure is being monitored continuously. The change in pore pressure as a function of time is a measure for the permeability of the layer in which the cone is stopped and thus it is an additional tool in characterising the type of subsoil.

2.1 Minimum subset of data

Since time and pore pressure are the main items of interest one might easily arrive at the conclusion that just time and pore pressure are the minimum subset of items to report. The CUR committee has decided that, next to the time and pore pressure, the cone resistance has to be reported as well. A dissipation test should be carried out at a constant depth. If by any means the penetration length is not exactly constant, pore pressure may change considerably, leading to seemingly inexplicable results. The (high) stiffness of the soil translates a change in depth into a change in cone resistance. So the cone resistance is a high quality indicator for small changes in depth, which may be the reason for these seemingly inexplicable results in the pore pressure.

For the storage and exchange of data the Geotechnical Exchange Format, GEF for short, is being used. A GEF file consists of a header and a data block. The header contains information about the data and its structure, whereas the data block contains the data to be reported, see e.g. annex 2 of [CUR 1999]. For reasons of simplicity and clarity just one test is to be reported in a file. The name of the standard report for dissipation tests is GEF-DISS-Report.

The minimum subset of data consists of the time, the pore pressure and the cone resistance. Since the absolute value of time since the beginning of the cone penetration test is of little relevance, the time since the beginning of the dissipation test is reported. The depth at which the dissipation test is performed, is a member of the minimum subset as well, since it is the common denominator of a cone penetration test and a dissipation test.

2.2 Relation between dissipation test and CPT

A relation exists between a cone penetration test and a dissipation test: one or several dissipation tests can be performed during a penetration test. So there is a drive to incorporated the relation between tests in a report: which tests are being generated as part of which other test? Two new GEF keywords were composed to report the relation between tests: PARENT and CHILD. For a complete description, see annex A.

Since new keywords are introduced, the version of GEF, as stated in GEFID, has to be changed. If the keywords Parent and Child are used in a file, the GEFID should read 1,1,0. GEF is downwards compatible, so for reading a CPT, GEFID=1,0,0 is sufficient, GEFID=1,1,0 will do nicely as well. GEFID will allow for methods to prevent errors in software. Software should check whether the GEFID in a file is less or equal to the current version of its GEF processing capabilities.

2.2.1 Use of Parent in GEF-DISS-Report

The standard GEF-DISS-Report imposes additional demands on the use of the optional items of the keywords Parent and Child.

Parent is a compulsory keyword in GEF-DISS-Report. All items except 'explanation' have to be stated. The characteristic property, in 'value' is the penetration length, unit is meters, quantity is penetration length, whereas the quantity number provides information about the type of test the keyword parent is referring to, see Table 2.1. The reference is usually the name of the file, in which the CPT is being reported, during which test the dissipation test was performed.

Example 1: suppose a CPT was performed, reported as a GEF-CPT-Report, stored as CPT_100141.GEF. At a penetration length of 10.0 meters below ground level a dissipation test is performed, reported as GEF-DISS-Report, stored as DISS_1.GEF. A similar dissipation test was performed at a penetration length of 15.18 meters below ground level. The latter file was stored as DISS_2.GEF.

In DISS_1 the keyword parent reads:
```
#PARENT = CPT_100141.GEF, 10.0, m, penetration length, 1
```
Additionally an explanation can be added:
```
#PARENT = CPT_100141.GEF, 10.0, m, penetration length, 1, first test
```

In DISS_2 the keyword parent reads:
```
#PARENT = CPT_100141.GEF, 15.18, m, penetration length, 1
```
Additionally an explanation can be added:
```
#PARENT = CPT_100141.GEF, 15.18, m, penetration length, 1, second test
```

Remark: in stead of the file name CPT_100141.GEF one is free to choose any unique feature of the CPT, e.g. its TESTID.

The quantity number, '1' in the example, is selected from Table 2.1. These quantity numbers refer to both parent and child.

Type of file	Quantity number
CPT	1
Dissipation test	2
Nuclear density test	3
Electric density test	4
Permeability test	5
Fuel Fluorescence Detection	6
Seismic measurement	7

Table 2.1 Type of test and their quantity number

If both CPT and dissipation tests are to be stored in a database, the context of the reference fields in parent and child might be lost, in particular if the reference fields contain file names. So in databases a more practical solution is to refer to the primary key of the tests involved.

Example 2: suppose a CPT, reported as a GEF-CPT-Report, is stored in a database. Its primary key is C100088. At a penetration length of 10.0 meters below ground level a dissipation test is performed, reported as GEF-DISS-Report. Its primary key is D200088. Another dissipation test was performed at a penetration length of 15.18 meters below ground level. The primary key of the latter test is D300088.

In the first dissipation test the keyword parent reads:
```
#PARENT = C100088, 10.0, m, penetration length, 1
```
Additionally an explanation can be added:
```
#PARENT = C100088, 10.0, m, penetration length, 1, first test
```

In the second dissipation test the keyword parent reads:
```
#PARENT = C100088, 15.18, m, penetration length, 1
```
Additionally an explanation can be added:
```
#PARENT = C100088, 15.18, m, penetration length, 1, second test
```

2.2.2 Use of Child in GEF-CPT-Report

In the standard GEF-CPT-Report 1, 0, 0 the dissipation test is not mentioned, it is unknown. If one chooses to report the relation with dissipation -or other type of- tests in GEF-CPT-Report, the version item of the keyword Procedurecode should read 1:
```
PROCEDURECODE = GEF-CPT-Report, 1, 1, 0, CUR 2000
```

The new version of the procedurecode 'GEF-CPT-Report' notifies that somewhere in the process of making and reporting a CPT at least one item is added or changed. Such a change may find its origin in an improvement of efficiency or clarity. There is no relation with enhancements in the GEF keywords, such as child or parent. This may sound confusing. Illustration: suppose there is no such thing as a dissipation test. The only enhancement to GEF-CPT-Report might have been: from now on measurementtext 9 is a compulsory item. As a result GEFID=1,0,0 would suffice to read files which follow the new standard. Since in GEF-CPT-Report 1,0,0 measurementtext 9 is not a compulsory item, we have to change merely the version of GEF-CPT-Report into 1,1,0.

Reporting the relation with other tests is not a compulsory item in GEF-CPT-Report: during only a limited amount of CPT's a dissipation test is performed. But even if a dissipation test is performed, it may not be reported, due to various circumstances.

When reporting dissipation tests in a GEF-CPT-Report file, all items except explanation are compulsory. The index field is used for reporting the number of the child. Reference is mainly used for stating the name of the file of the dissipation test, its testid or in some cases its primary key in a database. The characteristic value is the same as the value in the dissipation test: the penetration length when the dissipation test was performed. Note that penetration length is mainly a positive quantity. The unit is m, (meter), the quantity is penetration length. When reference is being made to a dissipation test, the quantity number should read 2, see Table 2.1.

Following the first example in section 2.2.1, the CPT relates to two children:

```
#CHILD = 1, DISS_1.GEF, 10.0, m, penetration length, 2
#CHILD = 2, DISS_2.GEF, 15.18, m, penetration length, 2, second test
```

Following the second example in section 2.2.1, the child keyword should read:

```
#CHILD = 1, D200088, 10.0, m, penetration length, 2
#CHILD = 2, D300088, 15.18, m, penetration length, 2, second test
```

Note that the explanation field ('second test') may be omitted. The inconsistency of reporting and omitting the explanation field in one file is introduced for educational reasons only.

3 GEF-DISS-REPORT FILE

3.1 Code words used in the GEF-DISS-Report file

A dissipation test is performed using the same equipment as the CPT, from which it spawns. So the keywords used in a dissipation test are in vast majority the same as in a GEF-CPT-Report file. The starting point of the dissipation report file is that the measurement variables and text which it sets out, have a fixed position. In accordance with the GEF definition, there is room for 1500 measurement variables and texts, where the first 128 variables and texts within the CPT Report definition are reserved for (future) "fixed" data (see Sections 3.2 and 3.3). Users can extend the list by adding further free variables and texts (numbers 129 up to and including 1500).

The exact definition of the keywords is reported on the world wide web: see http://www.geonet.nl.

Four types of variables are given in the list below, indicated between []:

- Character = a single readable symbol
- Text = readable text with a maximum of 256 characters, without commas or #s
- Number = an integer number
- Figure = a floating point number.

Items printed in **bold text** in the list below must **always** be present in a GEF-DISS-Report file, while the other items are optional. The italic text provides brief information about the relevant keyword.

#GEFID	**=**	**1,1,0** ***release number GEF***
#PARENT	**=**	**name of CPT file, value of penetration length, m, penetration length , 1**, explanation
#COLUMN	**=**	**[number]** ***the number of columns in the data block***
#COLUMNINFO	**=**	1**, s, time since beginning of the dissipation test, 21**[1]
#COLUMNINFO	**=**	2**, MPa, Pore pressure, 6**
#COLUMNINFO	**=**	3**, MPa, Cone value, 2**
#COLUMNMINMAX	=	1, [figure], [figure]
#COLUMNMINMAX	=	2, [figure], [figure]
#COLUMNMINMAX	=	3, …, … etc.
#COLUMNSEPARATOR	=	[character] *text dividing columns (default = space)*
#COLUMNTEXT	=	[number], [text] *text on or off; choose from* 0 = off 1 = on
#COLUMNVOID	=	1, [figure] *definition of "no value"*
#COLUMNVOID	=	2, [figure]
#COLUMNVOID	=	3, ... etc.
#COMPANYID	**=**	**[text], [text], [integer]** ***executing company***
#DATAFORMAT	=	ASCII (this is the compulsory data format)
#FILEDATE	**=**	**[number], [number], [number]** ***yyyy, mm, dd***

[1] See table in section 3.4

#FILEOWNER	**=**	**[text]** ***person responsible for the file***
#LASTSCAN	**=**	**[number]** ***number of measurement scans in data block***
#MEASUREMENTTEXT	=	1, [text], client
#MEASUREMENTTEXT	=	2, [text], project name
#MEASUREMENTTEXT	=	3, [text], name of location
#MEASUREMENTTEXT	=	**4, [text], cone type and serial number**
#MEASUREMENTTEXT	=	**5, [text], Mass and geometry of probe apparatus, incl. anchoring**
#MEASUREMENTTEXT	=	**6, [text], according to standard** ***NEN 5140 incl. Class*** ***NEN 3680….***
#MEASUREMENTTEXT	=	7, [text], own co-ordinate system
#MEASUREMENTTEXT	=	8, [text], own reference level
#MEASUREMENTTEXT	=	**9, [text], fixed horizontal level** *(= usually ground level)*
#MEASUREMENTTEXT	=	10, [text], orientation of biaxial inclination measurement (N-direction)
#MEASUREMENTTEXT	=	11, [text],unusual circumstances
#MEASUREMENTTEXT	=	20, [text], correction method for zero drift
#MEASUREMENTTEXT	=	21, [text], processing method for interruptions
#MEASUREMENTTEXT	=	22, [text], remarks
#MEASUREMENTTEXT	=	23, [text], remarks
#MEASUREMENTTEXT	=	30, [text], calculation formula for column …
#MEASUREMENTTEXT	=	31, [text], calculation formula for column …
#MEASUREMENTVAR	=	**1, [figure], mm^2, Nom. surface area of cone tip**
#MEASUREMENTVAR	=	2, [figure], mm^2, Nom. surface area of friction casing
#MEASUREMENTVAR	=	**3, [figure], -, Net surface area quotient of cone tip**
#MEASUREMENTVAR	=	4, [figure], -, Net surface area quotient of friction casing
#MEASUREMENTVAR	=	5, [figure], mm, cone distance to centre of friction casing
#MEASUREMENTVAR	=	6, [number], -, friction present
#MEASUREMENTVAR	=	7, [number], -, PPT u1 present
#MEASUREMENTVAR	=	8, [number], -, PPT u2 present
#MEASUREMENTVAR	=	9, [number], -, PPT u3 present *Either u1, u2 or u3 must be present in a dissipation test*
#MEASUREMENTVAR	=	10, [number], -, inclination measurement present
#MEASUREMENTVAR	=	11, [number], -, use of back-flow compensator
#MEASUREMENTVAR	=	**12, [number], -, type of penetration test**
#MEASUREMENTVAR	=	**13, [figure], m, pre-excavated depth**
#MEASUREMENTVAR	=	14, [figure], m, groundwater level
#MEASUREMENTVAR	=	15, [figure], m, water depth (for offshore activities works)
#MEASUREMENTVAR	=	16, [figure], m, end depth of penetration test
#MEASUREMENTVAR	=	17, [number], -, Stop criteria
#MEASUREMENTVAR	=	20, [figure], MPa, zero measurement of cone before penetration test
#MEASUREMENTVAR	=	21, [figure], MPa, zero measurement of cone after penetration test
#MEASUREMENTVAR	=	22, [figure], MPa, zero measurement friction before penetration test

#MEASUREMENTVAR	=	23, [figure], MPa, zero measurement friction after penetration test
#MEASUREMENTVAR	=	24, [figure], MPa, zero measurement PPT u1 before penetr. test
#MEASUREMENTVAR	=	25, [figure], MPa, zero measurement PPT u1 after penetr. test
#MEASUREMENTVAR	=	26, [figure], MPa, zero measurement PPT u2 before penetr. test
#MEASUREMENTVAR	=	27, [figure], MPa, zero measurement PPT u2 after penetr. test
#MEASUREMENTVAR	=	28, [figure], MPa, zero measurement PPT u3 before penetr. test
#MEASUREMENTVAR	=	29, [figure], MPa, zero measurement PPT u3 after penetr. test
#MEASUREMENTVAR	=	30, [figure], degrees, zero measurement inclination before penetr. test
#MEASUREMENTVAR	=	31, [figure], degrees, zero measurement inclination after penetr. test
#MEASUREMENTVAR	=	32, [figure], degrees, zero measurement inclination NS before penetr. test
#MEASUREMENTVAR	=	33, [figure], degrees, zero measurement inclination NS after penetr. test
#MEASUREMENTVAR	=	34, [figure], degrees, zero measurement inclination EW before penetr. test
#MEASUREMENTVAR	=	35, [figure], degrees, zero measurement inclination EW after penetr. test
#PROCEDURECODE	=	This-Company-DISSIPATION[2], 1,0,0 *release of DISS-Report*
#PROJECTID	**=**	**[text], [text], [text]** ***order number***
#RECORDSEPARATOR	=	[character] *symbol at end of a measurement scan (default = CR/LF)*
#REPORTCODE	**=**	**GEF-DISS-Report[3], 1, 0, 0**, dissipation test
#REPORTDATAFORMAT	=	[text] *print format per column, according to FORTRAN-definition* Iw = Integer, w positions long Fw.d = Floating pointing number, w positions long with d decimal positions Ew.d = The same, but with exponent
#SPECIMENVAR	=	1, [figure], m, [text], *depth in m –ground level and sample code according to NEN 5104 of the pre-drilled soil*
#SPECIMENVAR	=	n , [figure], m, [text], *depth in m –ground level and sample code according to NEN 5104 of the pre-drilled soil*
#STARTDATE	=	[number], [number], [number] *yyyy, mm, dd*
#STARTTIME	=	[number], [number], [number] *hh, mm, ss*
#TESTID	**=**	**[text]** ***number of penetration test***

[2] The procedurecode is the combination of all procedures which were necessary to obtain a dissipation report. A procedurecode links to the quality system of the company which performed the test.

[3] The reportcode notifies that the way of reporting a test, is conform the rules and guidelines as described in this document, what ever methods for measurement, analysis and filing were applied.

#XYID = **[number], [figure], [figure] , [figure] , [figure]** ***co-ordinate system, X, Y, delta X, delta Y***
The co-ordinate systems are linked to a country code so that the first numbers 0000-0009 are defined free or international.
00000 = own co-ordinate system *see #MEASUREMENTTEXT = 7*
00001 = Geographic Co-ordinate System
01000 = SPCS
31000 = RD: co-ordinate system = Cartesian, date = RD1918, projection method = stereographic
31001 = UTM-3N: co-ordinate system = Cartesian, date = ED50, projection method = Mercator, central meridian = 3°OL
31002 = UTM-9N: co-ordinate system = Cartesian, date = ED50, projection method = Mercator, central meridian = 9°OL
32000 = Belgian Bessel: co-ordinate system = geographic, date = BD72, projection method = Belgian Lambert
49000 = Gauss-Krüger: co-ordinate system = Cartesian, date = Potsdam, projection method = Transversal Mercator

#ZID = **[number], [figure] , [figure]** ***height system, Z, delta Z***
The first figure in ZID refers to the height of the fixed horizontal reference level, as given in measurementtext 9. It enables the conversion of a (corrected) penetration length into the height above a national (or international) reference level.
The height systems are linked to a country code. 000-009 are defined free or international
00000 = own reference level *see #MEASUREMENTTEXT = 8*
00001= Low Low Water Spring
31000= NAP
32000= Ostend Level
32001= TAW
49000= Normal Null

#EOH =

Remarks:
The order of appearance of the quantities cone value, time since the begin of the dissipation test and pore pressure in the keywords 'Columninfo' is not fixed. One is free to store the time, cone value and pore pressure in any column one likes. Each quantity can be recognised by its unique quantity number, see the table in section 3.4.

3.2 Reserved MEASUREMENTVAR's

The list in section 3.1 assigns a number of MEASUREMENTVAR variables. In a GEF-DISS-Report file and in a GEF-CPT-Report file these variables can only be used for the allotted quantities. The table below provides an overview of the numbers reserved for MEASUREMENTVAR's.

Sequential number	[Default] value	Unit	Quantity
1	[1000]	mm^2	nom. surface area cone tip
2	[15000]	mm^2	nom. surface area friction sleeve
3		-	net surface area quotient of cone tip
4		-	net surface area quotient of friction sleeve
5	[100]	mm	distance of cone to centre of friction sleeve
6	0= no 1= yes	-	friction present
7	0= no 1= yes	-	PPT u1 present
8	0= no 1= yes	-	PPT u2 present
9	0= no 1= yes	-	PPT u3 present
10	0= no 1= yes	-	inclination measurement present
11	0= no 1= yes	-	use of back-flow compensator
12	0= electronic penetration test 1= mechanical discontinue 2= mechanical continue	-	type of cone penetration test
13		m	pre-excavated depth
14		m	elevation of groundwater level with respect to the co-ordinate system used in ZID
15		m	water depth (for offshore activities)
16		m	end depth of penetration test
17	0= end depth reached 1= max. penetration force 2= cone value 3= max. friction value 4= max. PPT value 5= max. inclination value 6= obstacle 7= danger of buckling	-	stop criteria
18-19			for future use
20		MPa	zero measurement cone before penetration test
21		MPa	zero measurement cone after penetration test
22		MPa	zero measurement friction before penetration test
23		MPa	zero measurement friction after penetration test
24		MPa	zero measurement PPT u1 before penetration test
25		MPa	zero measurement PPT u1 after penetration test
26		MPa	zero measurement PPT u2 before penetration test
27		MPa	zero measurement PPT u2 after penetration test
28		MPa	zero measurement PPT u3 before penetration test
29		MPa	zero measurement PPT u3 after penetration test

Sequential number	[Default] value	Unit	Quantity
30		degrees	zero measurement inclination before penetration test
31		degrees	zero measurement inclination after penetration test
32		degrees	zero measurement inclination NS before penetration test
33		degrees	zero measurement inclination NS after penetration test
34		degrees	zero measurement inclination EW before penetration test
35		degrees	zero measurement inclination EW after penetration test
36-40			for future use
41		km	mileage

3.3 Reserved MEASUREMENTTEXT's

The measurementtext's in this section can only be used in a GEF-DISS-Report and a GEF-CPT-Report file for the allotted quantities. The table below provides an overview of the reserved numbers.

Sequential number	Quantity
1	client
2	name of the project
3	name of the location
4	cone type and serial number
5	mass and geometry of probe apparatus, including anchoring
6	applied standard, including class
7	own co-ordinate system
8	own reference level
9	fixed horizontal level (usually: ground level or flow bed)
10	orientation direction biaxial inclination measurement (N-direction)
11	unusual circumstances
12-19	for future use
20	correction method for zero drift
21	method for processing interruptions
22	remarks
23	remarks
24-29	for future use
30	calculation formula or reference for column number...
31	calculation formula or reference for column number...
32	calculation formula or reference for column number...

Sequential number	Quantity
33	calculation formula or reference for column number...
34	calculation formula or reference for column number...
35	calculation formula or reference for column number...
36-40	for future use
41	highway, railway or dike code

3.4 Definition of columns in the data block

The following table lists 21 quantities numbers. Each number is unequivocally linked to a physical quantity: the number identifies which physical quantity is listed in a specific column.

Measurement value or calculated value	Unit	Quantity number
penetration length	m	1
measure cone resistance q_c	MPa	2
friction resistance	MPa	3
friction number	%	4
pore pressure u_1	MPa	5
pore pressure u_2	MPa	6
pore pressure u_3	MPa	7
inclination (resultant)	degrees	8
inclination N-S	degrees	9
inclination E-W	degrees	10
corrected depth, measured below the fixed horizontal surface	m	11
time	s	12
corrected cone resistance q_t	MPa	13
net cone resistance q_n	MPa	14
pore ratio B_q	-	15
cone resistance number	Nm	16
weight per unit volume, γ	kN/m^3	17
in-situ, initial pore pressure u_o	MPa	18
total vertical soil pressure, σ_{v0}	MPa	19
effective vertical soil pressure, σ'_{v0}	MPa	20
time since begin of dissipation test	s	21

Remarks:
Only one of the pore pressures u_1, u_2 or u_3 is compulsory.

4 EXAMPLES

4.1 Minimal file

```
#GEFID= 1, 1, 0
#PARENT= 14.gef, 10.08, m, penetration length, 1
#COLUMN= 3
#COLUMNINFO= 1, s, time, 21
#COLUMNINFO= 2, MPa, Pore pressure u2, 6
#COLUMNINFO= 3, MPa, Cone value qc, 2
#COMPANYID= Ingenieursbureau Vlijtig B.V., 1651409H08, 31
#FILEDATE= 1999,04,15
#FILEOWNER= Fred Boor
#LASTSCAN= 1750
#MEASUREMENTTEXT= 4, F7.5CKE/V-1025, type of cone and serial number
#MEASUREMENTTEXT= 5, R 47, penetration equipment
#MEASUREMENTTEXT= 6, NEN 5140 klasse  2, used standard
#MEASUREMENTTEXT= 9, ground level, fixed horizontal plane
#MEASUREMENTVAR= 1, 15000, mm2, Nom. surface cone tip
#MEASUREMENTVAR= 3, 0.59, -, Net. surface quotient of the cone tip
#MEASUREMENTVAR= 12, 0, -, electrical CPT
#MEASUREMENTVAR= 13, 0.00, m, pre excavated depth
#REPORTCODE= GEF-DISS-Report,1,0,0
#PROJECTID= W-5250
#TESTID= NS 53023
#XYID= 31000, 104701, 411571, 1.0, 1.0
#ZID= 31000, -12.57, 0.01
#EOH=
<Data>
```

Remarks:

- The keyword GEFID identifies this file as being a GEF file, according to release 1, version 1 and update 0. Since Parent is being used, the version should read 1.
- The value item in the keyword Parent states that the dissipation test is performed at a penetration length of 10.08 m below the fixed horizontal plane, as reported in measurementtext 9: ground level.
- The value of -12.57 m in the keyword ZID determines the elevation of the test with respect to the zero reference of the Netherlands (31000 = NAP).
- The items of the keyword Reportcode provide the information that the dissipation test is reported according to the rules, as stated by the CUR committee E12, described in chapters 2 and 3 of this document.
- The items of Measurementtext's 4, 5 and 6 provide information about the equipment being used, and the standard being complied with.
- The items in measurementvar's 1, 3 and 13 are conform to the recommendations of the International Society Soil Mechanics and Foundation Engineering (CPT and CPTU) and the Dutch recommendations of NEN 5140.

4.2 Extended file

```
#GEFID= 1, 1, 0
#PARENT= 14.gef, 10.08, m, penetration length, 1, CPT
#COLUMN= 6
#COLUMNINFO= 1, MPa, Pore pressure u2, 6
#COLUMNINFO= 2, MPa, Cone value qc, 2
#COLUMNINFO= 3, m, Penetration length, 1
#COLUMNINFO= 4, m, Corrected penetration length, 11
#COLUMNINFO= 5, s, Time, 21
#COLUMNINFO= 6, s, Real time, 12
#COLUMNVOID= 1,  9999
#COLUMNVOID= 2,  9999
#COLUMNVOID= 3,  9999
#COLUMNVOID= 4,  9999
#COLUMNVOID= 5,  -999
#COLUMNVOID= 6,  -999
#COLUMNMINMAX= 1, -0.1, 0.4
#COLUMNMINMAX= 2, 15.55, 15.60
#COLUMNMINMAX= 3, 10.08, 10.08
#COLUMNMINMAX= 4, 10.05, 10.05
#COLUMNMINMAX= 5, 0, 2500
#COLUMNMINMAX= 6, 36075, 38575
#COMPANYID= Ingenieursbureau Vlijtig B.V., 1651409H08, 31
#DATAFORMAT= ASCII
#FILEDATE= 1999,04,15
#FILEOWNER= Fred Boor
#LASTSCAN= 1750
#MEASUREMENTTEXT= 1, PROJECTBUREAU HSL-ZUID INFRA, client
#MEASUREMENTTEXT= 2, GRONDONDERZOEK DERDE FASE 1998, name of project
#MEASUREMENTTEXT= 3, HAZELDONK - MOERDIJK (TRACEE DEEL 5), name of location
#MEASUREMENTTEXT= 4, F7.5CKE/V-1025, type of cone and serial number
#MEASUREMENTTEXT= 5, R 47, CPT equipment
#MEASUREMENTTEXT= 6, NEN 5140 klasse  2, local standard
#MEASUREMENTTEXT= 9, ground level, fixed horizontal plane
#MEASUREMENTVAR= 1, 15000, mm2, Nom. surface cone tip
#MEASUREMENTVAR= 2, 20002, mm2, Nom. surface friction sleeve
#MEASUREMENTVAR= 3, 0.59, -, Net surface quotient of cone tip
#MEASUREMENTVAR= 4, 1.00, -, Net surface quotient of friction sleeve
#MEASUREMENTVAR= 5, 81, mm, length between cone and the middle of the friction sleeve
#MEASUREMENTVAR= 12, 0, -, electrical CPT
#MEASUREMENTVAR= 13, 0.00, m, pre excavated depth
#MEASUREMENTVAR= 16, 20.83, m, final depth
#MEASUREMENTVAR= 17, 0, criterion for stopping the test: final depth reached
#MEASUREMENTVAR= 20,   0.643, MPa, zero of cone before test
#MEASUREMENTVAR= 21,   0.553, MPa, zero of cone after test
#MEASUREMENTVAR= 22,  -0.016, MPa, zero of pore pressure before test
#MEASUREMENTVAR= 23,  -0.015, MPa, zero of pore pressure after test
#REPORTCODE= GEF-DISS-Report,1,0,0
#PROCEDURECODE= Vltg-Diss,1,0,0, Quality manual: Dissipatie 1999-05-01
#PROJECTID= W-5250
#TESTID= NS 53023
#XYID= 31000, 104701, 411571, 1.0, 1.0
#ZID= 31000, -12.57, 0.01
#EOH=
<Data>
```

Remarks:

- The items in the keyword Procedurecode refer to the quality system of the engineering company 'Vlijtig Ltd'. Their quality manual will provide detailed information of the entire process of the methods for measurement, analysis, filing and reporting a dissipation test.
- The items in the keyword Reportcode state that one of the phases in the process of the engineering company is replaced by the rules according to CUR's definition for the exchange of results of dissipation tests, as described in this document.

A ANNEX A

In this annex the new keywords Parent and Child will be described in detail. Information about the 'old' keywords can be found on http://www.geonet.nl. The new ones are general purpose keywords, which can be used in any GEF file. Neither Parent nor Child are compulsory keywords in a GEF file. In this way no demands are imposed on general GEF files, which do not have a relation with other tests or files. Since the number of keyword is extended and since these keywords are not known in software, written in advance of this document, a new version of GEFID is introduced. If either Parent or Child is used, the GEFID should read at least: #GEFID = 1,1,0

#PARENT

#PARENT= sReference[, 8value, sUnit, sQuantity[, iQuantity number[, sExplanation]]]

sReference	Reference to the parent (type string, text)
8value	Characteristic value of the parent (type double floating point)
sUnit	Unit of this characteristic value (type string, text)
sQuantity	Description of the characteristic quantity (type string, text)
iQuantity number	A number describing the type of test of the parent (type integer)
sExplanation	Explanation of the field (type string, text)

Example: #PARENT= 14.gef, 10, m, penetration length, 1, CPT

Remarks:
- Parent is only listed in files, which report tests that are performed as part of another test; e.g. parent appears in a dissipation test.
- The reference item in the parent keyword must hold an unique identifier as a link to the parent test. It is usually a name of a file. Another possibilities is a primary key in a database. The reference field may contain up to 1023 characters. This item is compulsory.
- When files are transferred between different clients, one should avoid using path names, since there is no guarantee for a unique directory structure.
- The [] indicate that these fields are, generally spoken, optional. Nested [] indicate additional levels of optional fields.
- The items value, unit and quantity are optional. They form a group of items. If a 'value' is given, the 'unit' and 'quantity' must be given as well. The reason is, that if the unit is omitted, it is impossible to know what the value really means. 'unit' and 'quantity' are conditionally compulsory. If a value without a dimension is listed, e.g. merely a number, 'unit' is marked by '-'. For each value a description for 'quantity' can be given: e.g. a number of a scan, a depth or a date(20000419)
- The item quantity number is optional. It allows for an automatic recognition of the type of test. If value, unit an quantity are not listed, quantity number can not be listed as well.
- The item explanation is optional. If the quantity number is not listed, explanation can not be listed either.

Examples:
```
#PARENT= 14.gef, 755, -, scan number, 1, CPT
#PARENT= 14.gef, 10.0, m, penetration length, 1, CPT
#PARENT= R330167, 10.0, m, penetration length, 1, CPT
```

#CHILD=

#CHILD= iIndex, sReference[, 8value, sUnit, sQuantity[, iQuantity number[, sExplanation]]]

iIndex	The number of the child, mandatory, max. 1500 (type integer).
sReference	Reference to the child (type string, text)
8value	Characteristic value of the child (type double floating point)
sUnit	Unit of this characteristic value (type string, text)
sQuantity	Description of the characteristic quantity (type string, text)
iQuantity number	A number describing the type of test of the child (type integer)
sExplanation	Explanation of the field (type string, text)

Example: #CHILD= 3, d1.gef, 10, m, penetration length, 2, dissipation test

Remarks:

- Child is only listed in files of tests during which other tests are performed; e.g. child is listed in GEF-CPT-Report.
- The reference item in the child keyword must hold an unique identifier as a link to the child. It is usually a name of a file. Another possibility is a primary key in a database. The reference field may contain up to 1023 characters. This item is compulsory.
- When files are transferred between different clients, one should avoid using path names, since there is no guarantee for a unique directory structure.
- The [] indicate that these fields are, generally spoken, optional. Nested [] indicate additional levels of optional fields.
- The items value, unit and quantity are optional. They form a group of items. If a 'value' is given, the 'unit' and 'quantity' must be given as well. The reason is, that if the unit is omitted, it is impossible to know what the value really means. 'unit' and 'quantity' are conditionally compulsory. If a value without a dimension is listed, e.g. merely a number, 'unit' is marked by '-'. For each value a description for 'quantity' can be given: e.g. a number of a scan, a depth or a date(20000419)
- The item quantity number is optional. It allows for an automatic recognition of the type of test. If value, unit an quantity are not listed, quantity number can not be listed as well.
- The item explanation is optional. If the quantity number is not listed, explanation can not be listed either.

Examples:

```
#CHILD= 1, d1.gef, 755, - , scan number, 2, dissipation test
#CHILD= 2, d1.gef, 8.75, m , penetration length, 2, dissipation test
#CHILD= 3, R3141593, 4.13, m , penetration length, 2, dissipation test
```