Project standard

Pore Pressure Transducer (PPT)

Our reference
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Version
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1 Pore Pressure Transducer (PPT)

PPT's are widely used in automatic monitoring schemes. Usually a PPT is an electronic device. It can be automatically read out by a data logger.

1.1 Compulsory keywords

#GEFID = 1,0,0
#COLUMN = 2
#COLUMNINFO = 1, unit, time, qn
#COLUMNINFO = 2, kPa, Pore pressure, 2001
#FILEDATE = yyyy, mm, dd
#PROJECTID = Name of the project
#FILEOWNER = Creator of the file
#EOH=

The unit of time may be chosen freely from within seconds, minutes, hours, days or weeks.

1.2 Compulsory keywords for this standard.

#PROCEDURECODE = GEF-PPT-Measurement, 1, 0, 0, ppt100.pdf
#MEASUREMENTCODE = GEF-PPT-Measurement, 1, 0, 0, ppt100.pdf
#COMPANYID = name of the company, VAT number, country code
#COLUMNVOID = 1, void column 1
#COLUMNVOID = 2, void column 2
#MEASUREMENTTEXT = 1001, offset;sensitivity;range;qn;serialnumber
#STARTDATE = yyyy, mm, dd
#STARTTIME = hh, mm, sec.ssssss
#TIMECOLUMN = 1, timecode, unit
#EQUIPMENT = Unique ID for the PPT
#TESTID = Number or identification of the test

      Either:

#MEASUREMENTTEXT = 201, qn;(xp;yp;zp);unit;coordsystem, location transducer
#MEASUREMENTTEXT = 751, coordsystem;(xs;ys;zs);unit, origin coordsystem
#MEASUREMENTTEXT = 761, coordsystem; $(r_{11};r_{12};r_{13};r_{21};r_{22};r_{23};r_{31};r_{32};r_{33})$, rotation coordsystem

    or

#XYID = code, X, Y[, Δx, Δy]
#ZID = code, Z[, Δz]

Notes.
- One can either use local coordinate systems or a (inter)national coordinate system. The choise depends on the type of test.
    - If field tests are recorded, the use of XYID and ZID is recommended.
    - For laboratory tests the use of Measurementtext 201, 751 and 761 is advantageous.
- The text field of Measurementtext 201 is combined of the quantity number of the PPT, its location in a local coordinate system (xp, yp and zp), the unit of the coordinates and the number of the coordinate system.

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- The text field of Measurementtext 751 is combined of the number of the coordinate system, the coordinates of the origin of this coordinate system with respect to the previous coordinate system and the unit of the coordinates. It can be interpreted as the translation between the two origins. (0;0;0) means no translation.
- The text field of Measurementtext 761 consists of the number of the coordinate system and the elements of the rotational matrix. This matrix transforms the axes of the local coordinate system into the axes ot the previous coordinate system. (1;0;0;0;1;0;0;0;1) means no rotation.
- The text field of Measurementtext 1001 is combined of the electric zero offset of the PPT, the sensitivity of the PPT, the span (full scale value) of the PPT in physical units, the quantity number of the PPT and the serial number of the PPT.
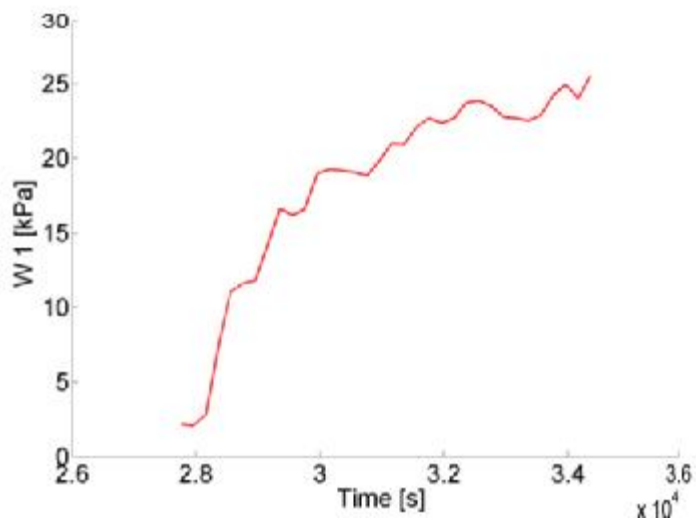
1.3 Free keywords

Other keywords may be used, but don't have a agreed meaning between sender and receiver of the file, especially keywords like Measurementtext and Measurementvar.

2   Example

```
#GEFID = 1,0,0
#PROJECTID = Pore pressures in set-up
#FILEOWNER = Adel
#COLUMN = 2
#COLUMNINFO = 1, s, Time, 101
#COLUMNINFO = 2, kPa, W1, 2001
#FILEDATE = 2006, 08, 01
#PROCEDURECODE = GEF-PPT-Measurement, 1, 0, 0, ppt100.pdf
#MEASUREMENTCODE = GEF-PPT-Measurement, 1, 0, 0, ppt100.pdf
#COMPANYID = GeoDelft, 8000.97.476.B.01, 31
#COLUMNVOID = 1, -9999
#COLUMNVOID = 2, -9999
#MEASUREMENTTEXT = 201, 2001;(50;25;500);mm;1, location transducer
#MEASUREMENTTEXT = 751, 1;(514;370;0);mm, origin local coordsystem
#MEASUREMENTTEXT = 761, 1;(1;0;0;0;1;0;0;0;1); rotation local coordsystem
#MEASUREMENTTEXT = 1001, -0.174;16.143;500 kPa;2001;18076
#TIMECOLUMN = 1, 1, s
#STARTDATE = 2006, 08, 01
#STARTTIME = 9, 30, 37
#EQUIPMENT = 18076
#TESTID = U12
#REPORTDATAFORMAT= F7.1 F7.2
#EOH=
27760.0     2.19
27960.0     2.10
28160.0     2.82
28360.0     7.27
28560.0    11.06
28760.0    11.61
28960.0    11.80
29160.0    14.23
29360.0    16.62
29560.0    16.16
29760.0    16.62
29960.0    19.01
30160.0    19.26
30360.0    19.16
30560.0    19.07
30760.0    18.82
30960.0    19.85
31160.0    21.00
31360.0    20.95
31560.0    22.12
31760.0    22.70
31960.0    22.35
32160.0    22.68
32360.0    23.75
32560.0    23.88
32760.0    23.51
32960.0    22.77
33160.0    22.69
33360.0    22.53
33560.0    22.89
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```
33760.0    24.22
33960.0    24.95
34160.0    24.02
34360.0    25.52
```


This example shows that there is a local coordinate system with translation 514 mm in X direction, and 370 mm in Y direction of the root system. Axes are not rotated. The PPT is mounted 50 mm in X direction, 25 mm in Y direction and 500 mm in Z direction with regard to the origin of the local coordinate system #1.

The electrical characteristics of the PPT are: a zero offset of -0.174 and a sensitivity of 16.143. The PPT is 500 kPa full scale. The quantity number is 2001, which connects the transducer with column 2. The serial number of the transducer is 18076, which connects the transducer to its data sheet, manufacturer and production process.

Reportdataformat was added for a nicely readable layout of the data block.

The unit of time has been chosen to be second.

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3   General

In the next sections the commonly used keywords are briefly described. For an extended description is refered to www.geffiles.org/language/index.html. The type of file is a registration of a single transducer.

3.1   Compulsory keywords

This type of keywords should always be present in a GEF file, irrespectively of the standard used. The order of appearance of nearly all keywords does not matter. Exceptions are GEFID which should be the first keyword of the header and EOH which should be the last keyword of the header.

#GEFID = *release*, *version*, *update*
States the type of file: a GEF file. Currently the release, version and update of a GEF file can be either 1, 0, 0 or 1, 1, 0. This keyword should be the first keyword in the header.

#COLUMN = *n*
The number of columns, n is max. 250

#COLUMNINFO = *i, unit, quantity, quantitynumber*
Provides information for the i-th column. Which unit (e.g. kPa) and which quantity (e.g. pore pressure) has been reported. The quantity number is an identification for the type of quantity and specific transducer. It allows for an easy automatic recognition, irrespectively of the language and spelling of the quantity. The number of lines with COLUMNINFO in the header should be exactly the same as the number of columns, reported in COLUMN.

#FILEDATE = *yyyy, mm, dd*
The date on which the file was generated: year, month and day. yyyy should be Y2k compliant.

#PROJECTID = *type*[, *number*[, *subprojectnumber*]]
Projectidentification. The first field is compulsory, the second an third fird are optional. It identifies the company that has performed the measurements. Usually type is CO (commercial), number is the project number, and subprojectnumber is what it describes: the number of the subproject.

#FILEOWNER = *name*
The name of the person responsible for the header and data in this file.

#EOH=
Marks the end of the header, no other keywords may follow this keyword. After the = sign of #EOH= a carriage return and linefeed (Windows) or linefeed (Unix) is added. The data follows the linefeed immediatedly.

3.2   Compulsory keywords for a standard.

The keywords are strictly spoken, not compulsory for a correct GEF file, however for the correct interpetation of this specific type of measurement, these keywords are vital.

#PROCEDURECODE = *code*, *release*, *version*, *update*, *referencedocument*
The code states which method of measuring, analysis, filing and reporting has been followed or should be followed. Release version and update provide information about the updates in the past: which specific method has been followed. The referencedocument refers to a written

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document, in which the standard is described. It can be a document, as written by the user itself, but it may be an official document of e.g. ASTM, NEN or ISO as well.

#MEASUREMENTCODE = *code*, *release*, *version*, *update*, *referencedocument*
The code states which method of measuring has been followed or should be followed. Release version and update provide information about which version of the measuring standard has been used. The reference document refers to a written document, in which the standard is described. It may be an official document of e.g. ASTM or ISO, or a chapter of the quality manuals of a company.

#COMPANYID = *Name of the company*, *VAT number*, *country code*
Identifies which company has created the file. The VAT number is a unique code which is used in the countries of the European union by the government (Finance department) to identify a company. The country code is equal to the international access number for a country. The Netherlands is 31, Belgium is 32, UK 44, Germany 49 etc.

#COLUMNVOID = *i, value*
If a or more scans in the i-th column are not measured or are not valid, value is used to indicate that this scan should not be processed. For value usually a number is chosen, which is not likely to occur, like -9999.

#EQUIPMENT = *TransducerID*
Which transducer (serial number) has been used.

#MEASUREMENTVAR = *i*, *value*, *unit, quantity*
Provide information on static data: its value, its unit and which quantity has been measured. Maximum of 1500 measurementvars.

#MEASUREMENTTEXT = *i*, *text*, *explanation*
Provide information about static features of the experiment.

#STARTDATE = *yyyy*, *mm*, *dd*
The year, month and date a test has started. It may be used as a zero date, e.g. January 1th, 2000. yyyy should be Y2k compliant.

#STARTTIME = *hh*, *min*, *sec*
The hour, minute and second the measurement has started. It may be used as a reference time, e.g. 00, 00, 0.0

#TIMECOLUMN = *i, timecode, unit*
This keyword explains that in the i-th column the time is recorded. Its unit is described by a code in the timecode field and optionally by the unit in the last field. Commonly used timecode's are 1 (seconds) and 4 (days).

#TESTID = *ID of the test*
The number of the experiment

#XYID = *code*, *x*, *y*[, *Dx*, *Dy*]
The location of the transducer. Code refers to a particular coordinate system. x and y are the values. Δx, Δy are optional, they signal the uncertainty in the location.

#ZID = *code*, *Z*[, *Dz*]
The heigth of the transducer. Code refers to a specific datum. The height is usually expressed in m. Δz is optional, it provides information about the uncertainty of the measured height.

3.3   Optional keywords

As a matter of fact all keywords not mentioned above are optional. One is free to add them, but do not expect a specific meaning, since there has been no arrangement for these keywords in the context of the standard. Merely for cosmetic purposes.