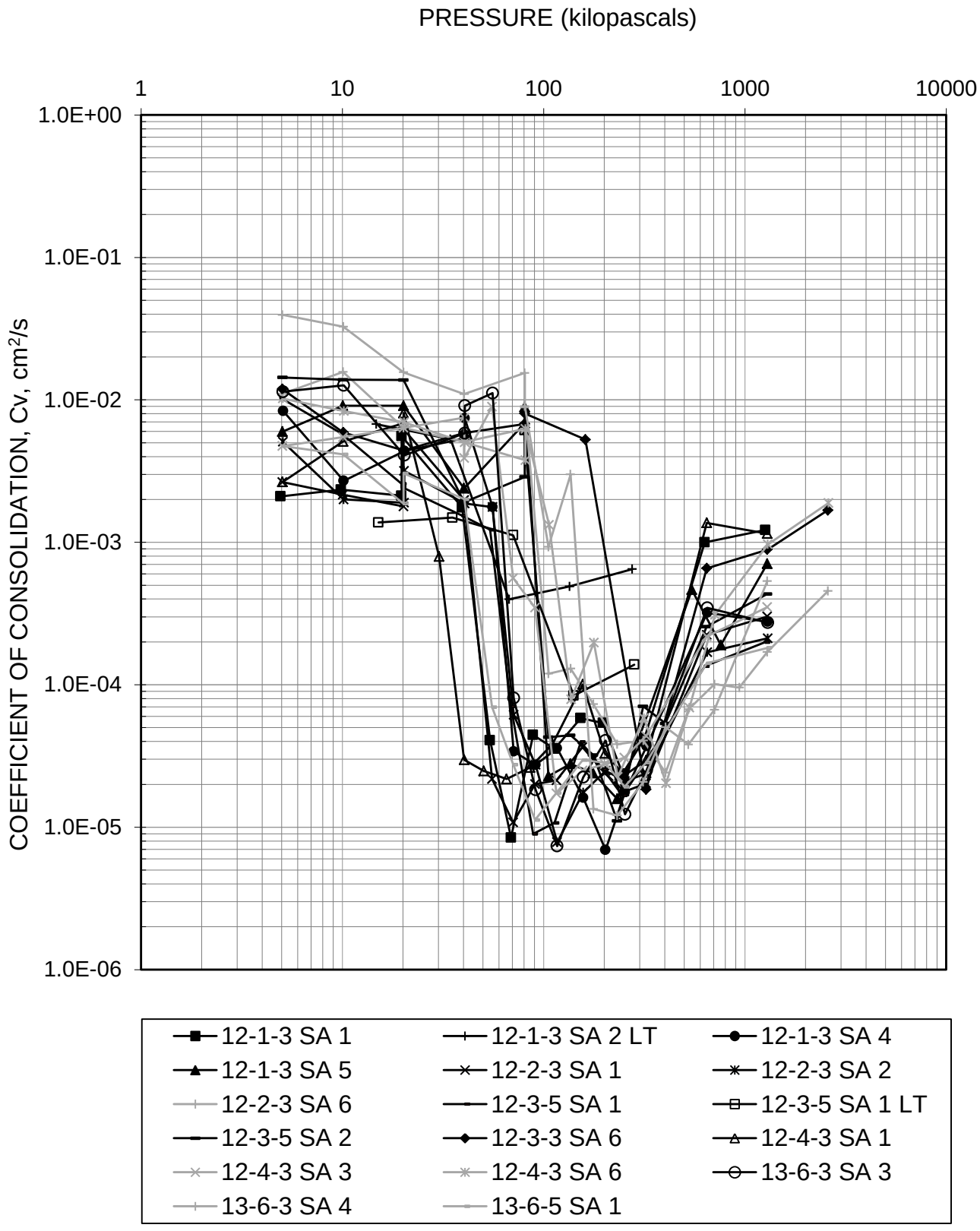
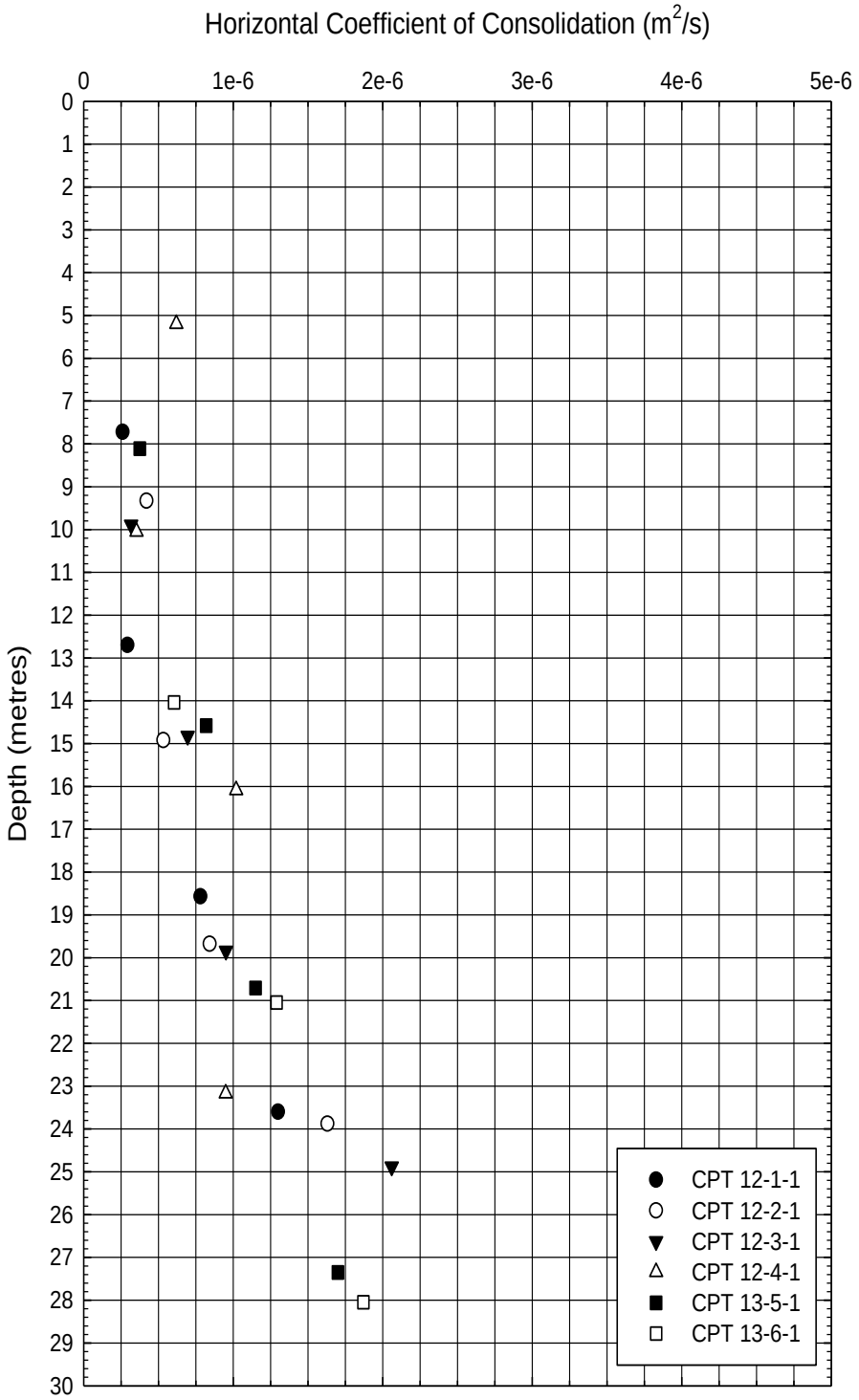
APPENDIX G

Summary of Measured/Interpreted Coefficients of Vertical and Horizontal Consolidation



Note : LIR not = 1, use Cv's with caution

Golder Associates	SCALE: AS SHOWN	TITLE: **SUMMARY OF VERTICAL COEFFICIENTS OF CONSOLIDATION**	
	DATE: 11/28/13		
	CADD: N/A		
	DESIGN: CW		
FILE No.: Consolidation summary	CHECK: SAT		
PROJECT No.: 12-1125-0045 REV.: 0	REVIEW: MIC		FIGURE: **G1**



Golder Associates	SCALE: AS SHOWN	TITLE: **SUMMARY OF HORIZONTAL COEFFICIENTS OF CONSOLIDATION**	
	DATE: 11/28/13		
	CADD: N/A		
	DESIGN: MIC		
FILE No.: Consolidation summary	CHECK: SAT		
PROJECT No.: 12-1125-0045 REV.: 0	REVIEW:		FIGURE: **G2**

Dissipation Tests Results

Dissipation tests

Dissipation tests consists of stopping the piezocone penetration and observing porepressures (u) with elapsed time (t). The data are automatic recorded by the field computer and should take place until a minimum of 50% dissipation.

The porepressures are plotted as a function of square root of (t). The graphical technique suggested by Robertson and Campanella (1989), yields a value for t_{50}, which corresponds to the time for 50% consolidation.

The value of the coefficient of consolidation in the radial or horizontal direction c_h was then calculated by Houlsby and Teh's (1988) theory using the following equation:

$$c_h = \frac{T \times r^2 \times I_r^{0.5}}{t_{50}}$$

where:

T: time factor given by Houlsby and Teh's (1988) theory corresponding to the porepressure position
r: piezocone radius
I_r: stiffness index, equal to shear modulus G divided by the undrained strength of clay (S_u).
t_{50}: time corresponding to 50% consolidation

Permeability estimates based on dissipation test

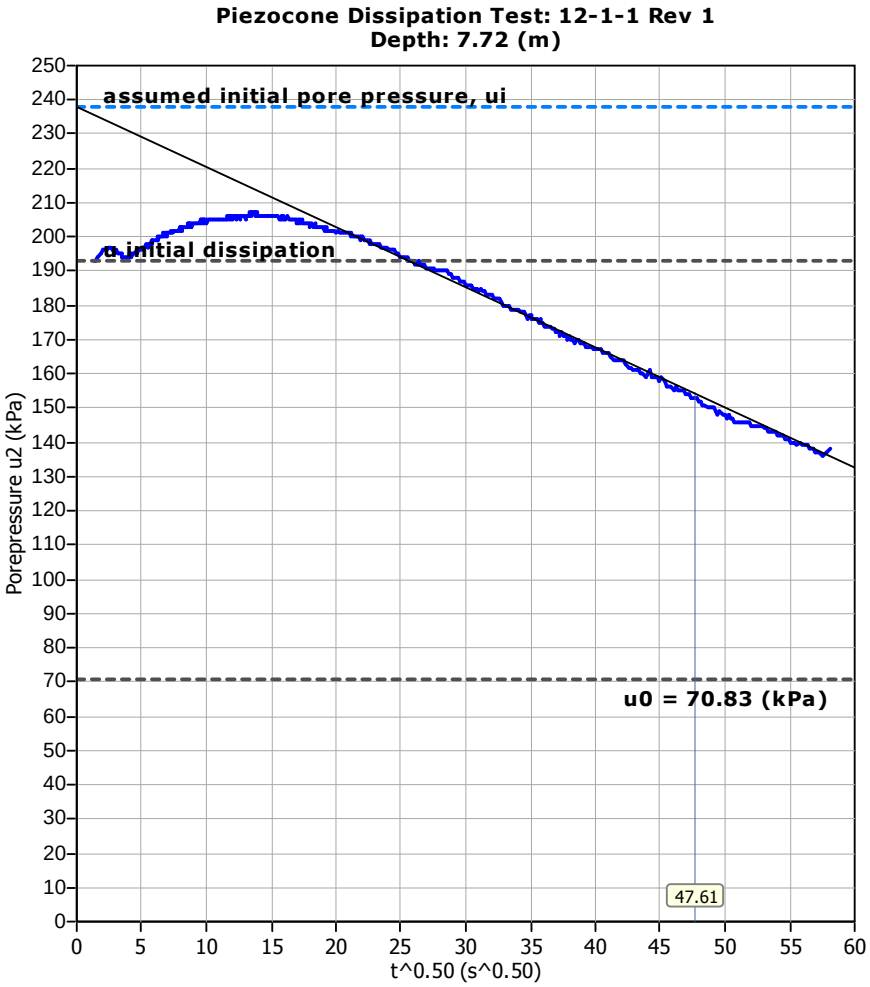
The dissipation of pore pressures during a CPTu dissipation test is controlled by the coefficient of consolidation in the horizontal direction (c_h) which is influenced by a combination of the soil permeability (k_h) and compressibility (M), as defined by the following:

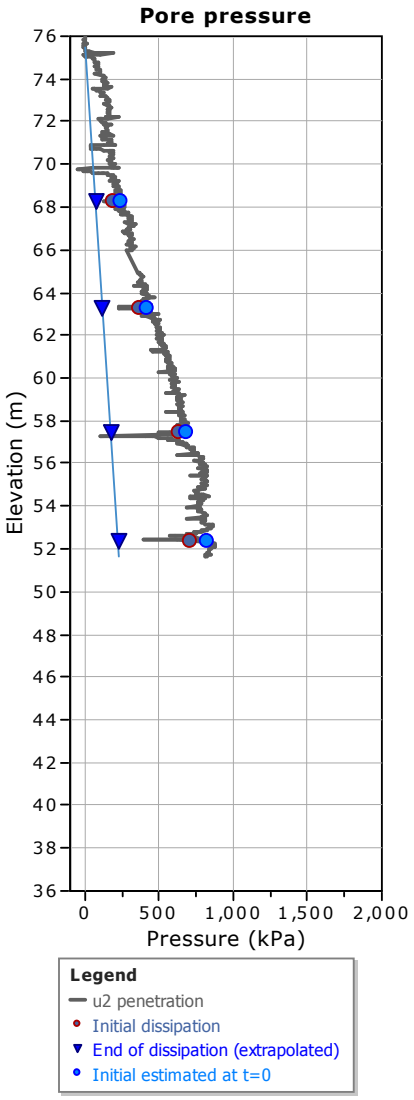
$$k_h = c_h \times \gamma_w / M$$

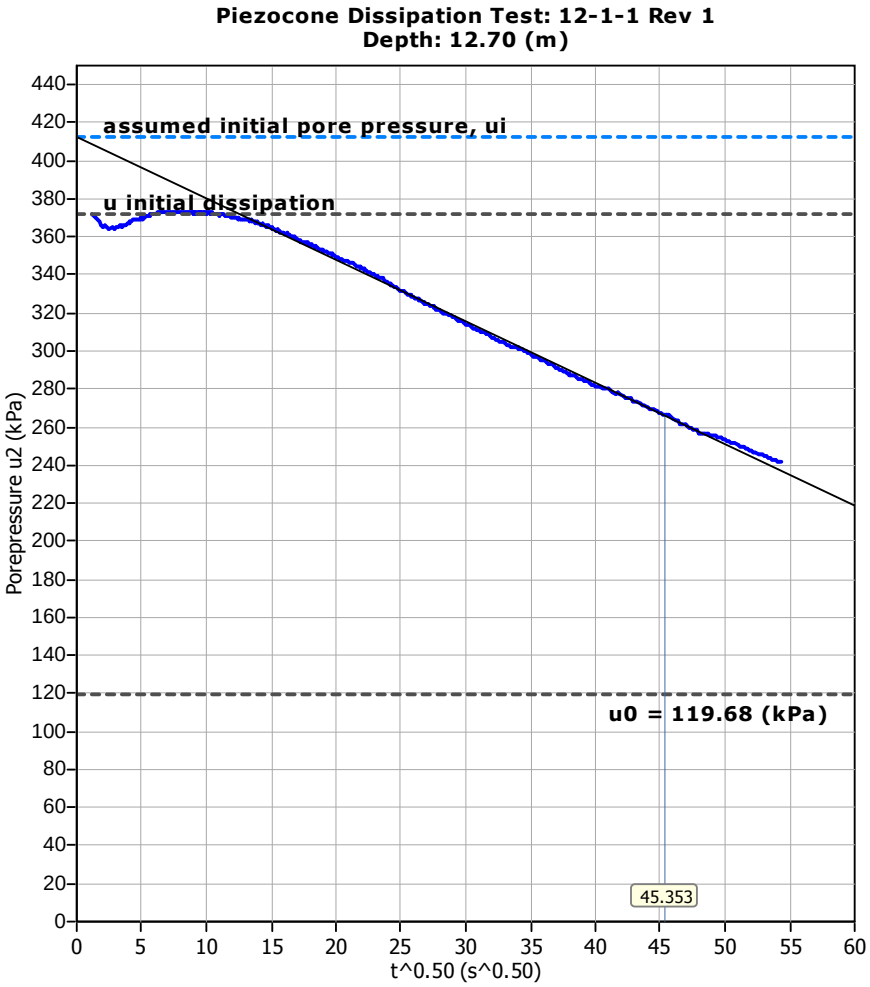
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

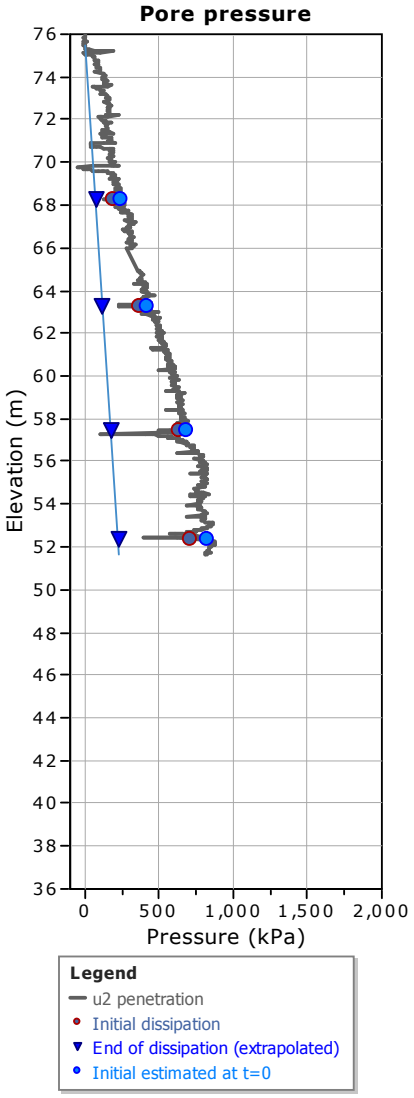
Tabular results

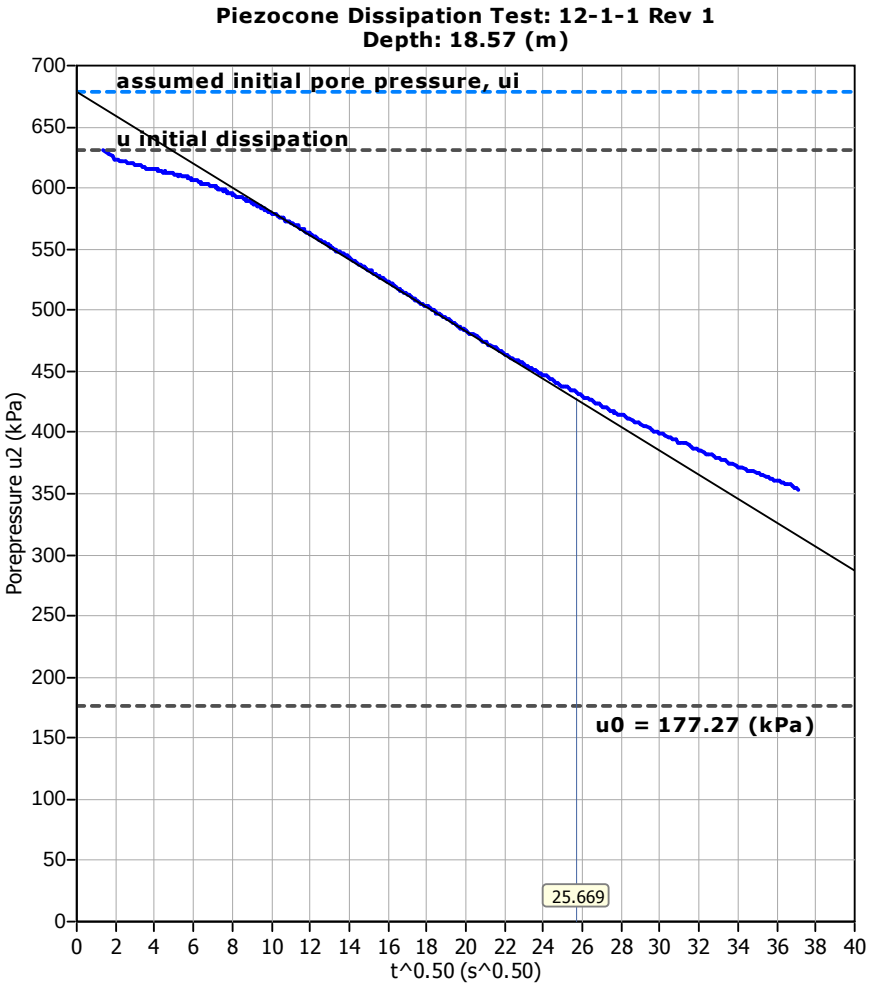
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
12-1-1 Rev 1	7.72	47.6	2267	7.19E-005	57.00	2.61E-007	8	0.88	2.91E-009
12-1-1 Rev 1	12.70	45.4	2057	6.52E-005	59.00	2.93E-007	9	2.32	1.24E-009
12-1-1 Rev 1	18.57	25.7	659	2.09E-005	43.00	7.81E-007	25	3.71	2.06E-009
12-1-1 Rev 1	23.60	21.8	474	1.50E-005	62.00	1.30E-006	41	3.64	3.51E-009

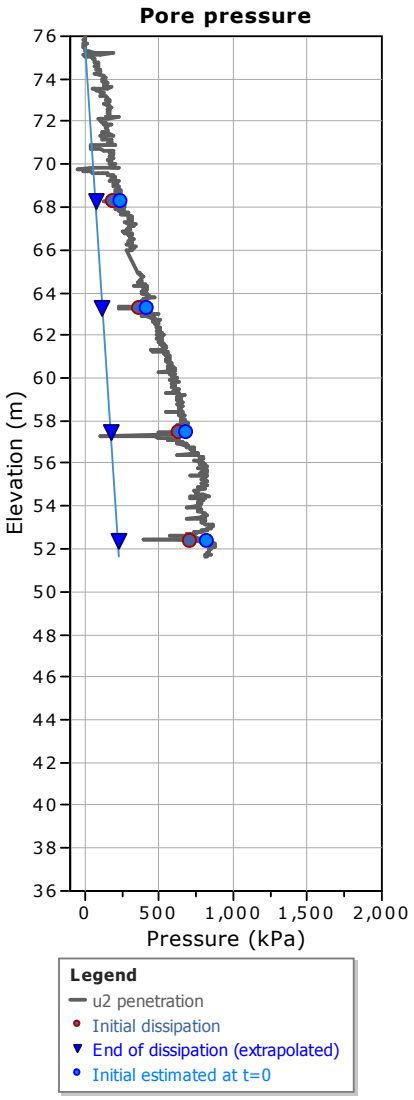

Piezocone Dissipation Test: 12-1-1 Rev 1
Depth: 7.72 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 70.83 (kPa)
47.61
Porepressure u2 (kPa)
t^0.50 (s^0.50)

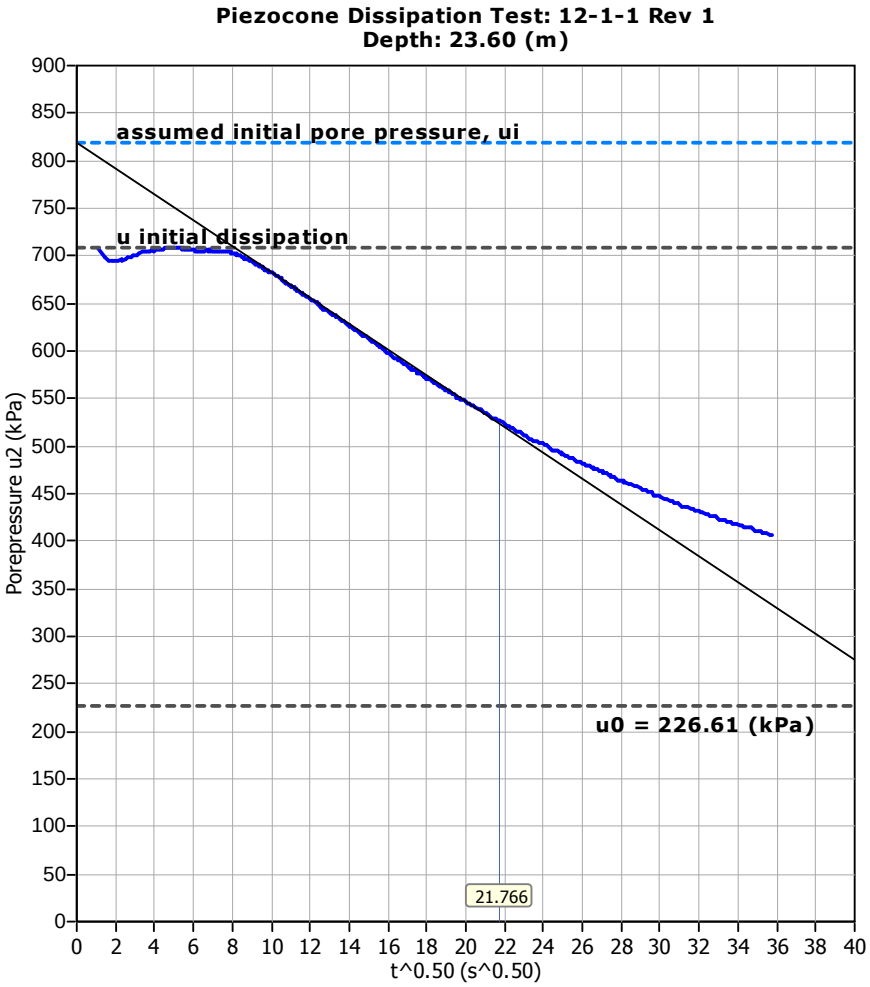

Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

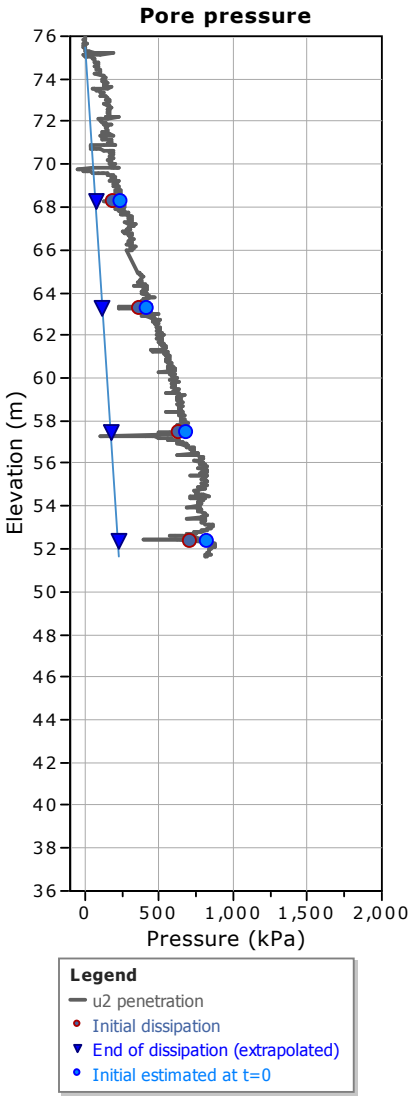

Piezocone Dissipation Test: 12-1-1 Rev 1
Depth: 12.70 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 119.68 (kPa)
45.353
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-1-1 Rev 1
Depth: 18.57 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 177.27 (kPa)
25.669
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-1-1 Rev 1
Depth: 23.60 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 226.61 (kPa)
21.766
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

Dissipation Tests Results

Dissipation tests

Dissipation tests consists of stopping the piezocone penetration and observing porepressures (u) with elapsed time (t). The data are automatic recorded by the field computer and should take place until a minimum of 50% dissipation.

The porepressures are plotted as a function of square root of (t). The graphical technique suggested by Robertson and Campanella (1989), yields a value for t_{50}, which corresponds to the time for 50% consolidation.

The value of the coefficient of consolidation in the radial or horizontal direction c_h was then calculated by Houlsby and Teh's (1988) theory using the following equation:

$$c_h = \frac{T \times r^2 \times I_r^{0.5}}{t_{50}}$$

where:

T: time factor given by Houlsby and Teh's (1988) theory corresponding to the porepressure position
r: piezocone radius
I_r: stiffness index, equal to shear modulus G divided by the undrained strength of clay (S_u).
t_{50}: time corresponding to 50% consolidation

Permeability estimates based on dissipation test

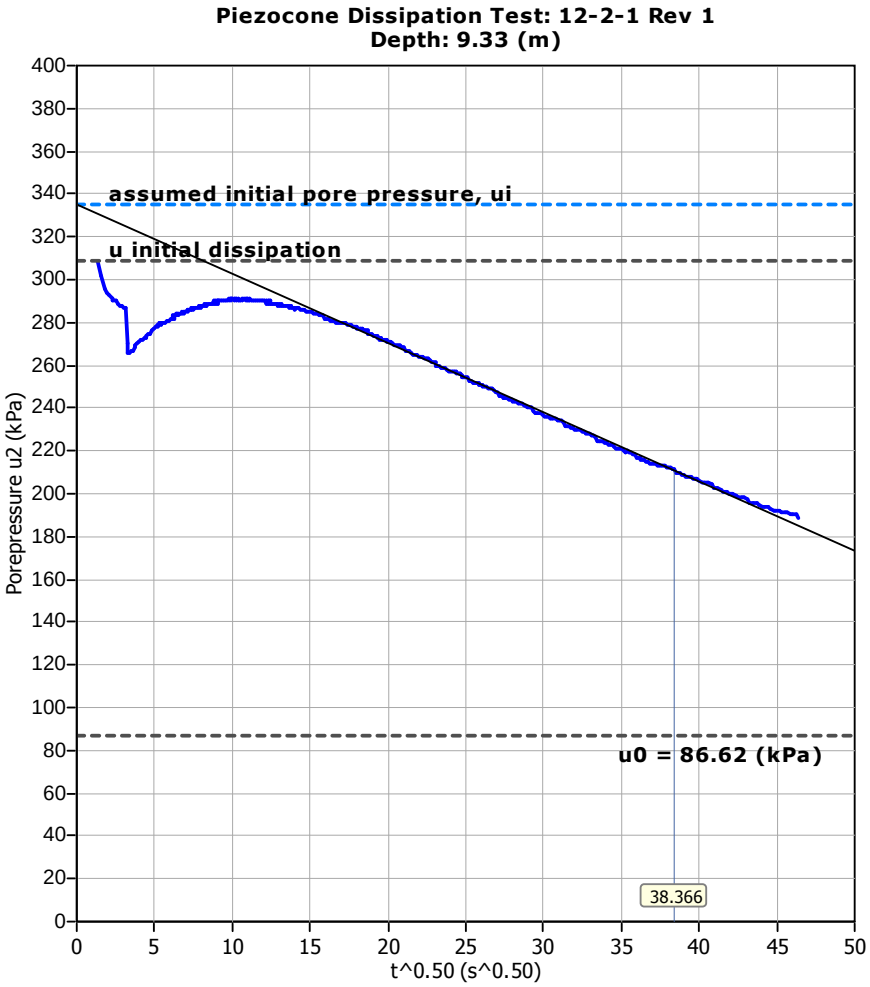
The dissipation of pore pressures during a CPTu dissipation test is controlled by the coefficient of consolidation in the horizontal direction (c_h) which is influenced by a combination of the soil permeability (k_h) and compressibility (M), as defined by the following:

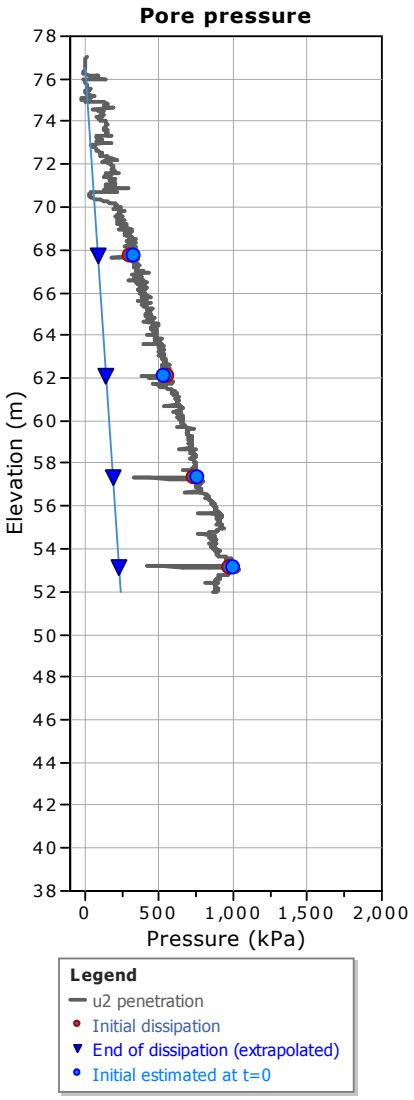
$$k_h = c_h \times \gamma_w / M$$

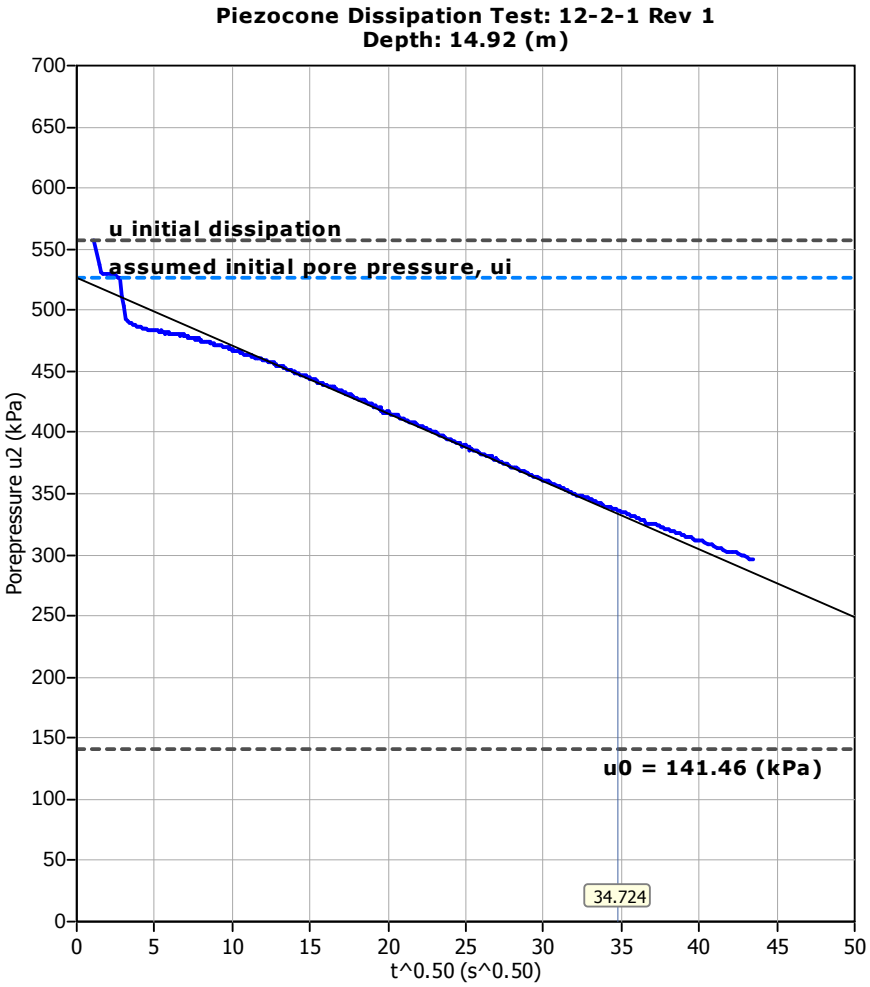
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

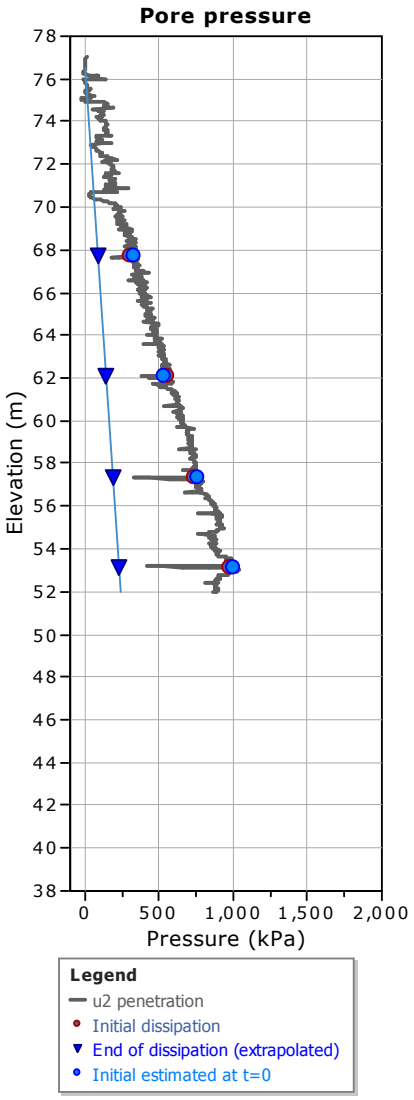
Tabular results

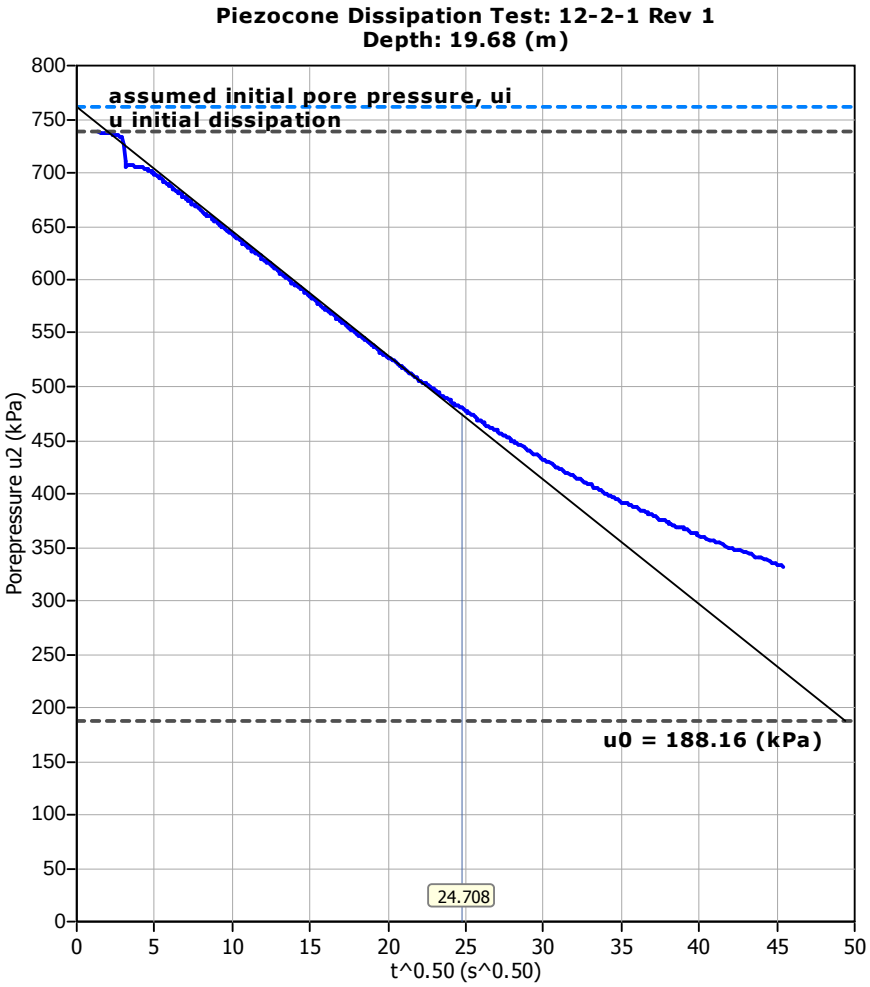
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
12-2-1 Rev 1	9.33	38.4	1472	4.67E-005	62.00	4.20E-007	13	1.57	2.62E-009
12-2-1 Rev 1	14.92	34.7	1206	3.82E-005	67.00	5.33E-007	17	2.99	1.75E-009
12-2-1 Rev 1	19.68	24.7	610	1.94E-005	43.00	8.43E-007	27	3.68	2.24E-009
12-2-1 Rev 1	23.88	19.3	371	1.18E-005	59.00	1.63E-006	51	7.50	2.13E-009

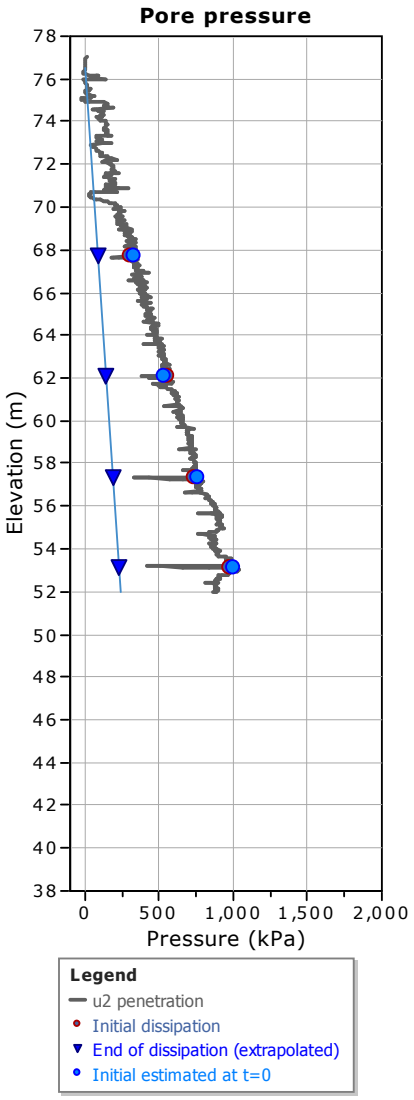

Piezocone Dissipation Test: 12-2-1 Rev 1
Depth: 9.33 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 86.62 (kPa)
38.366
Porepressure u2 (kPa)
t^0.50 (s^0.50)

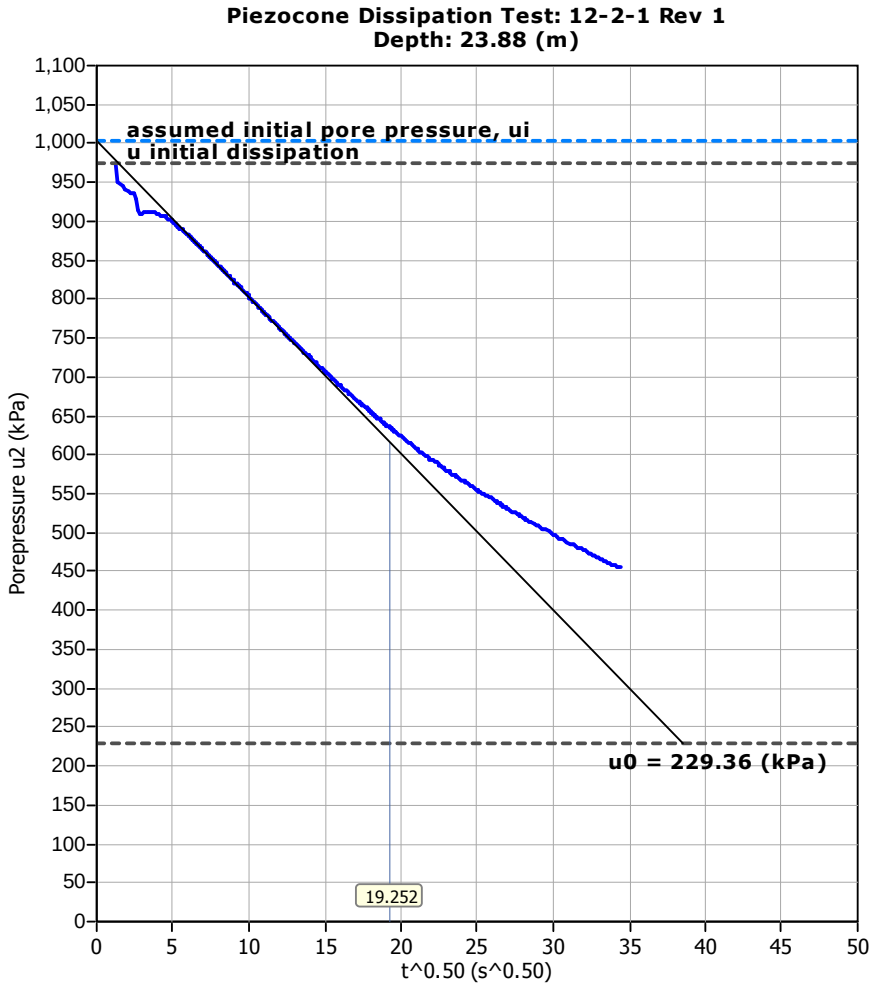

Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

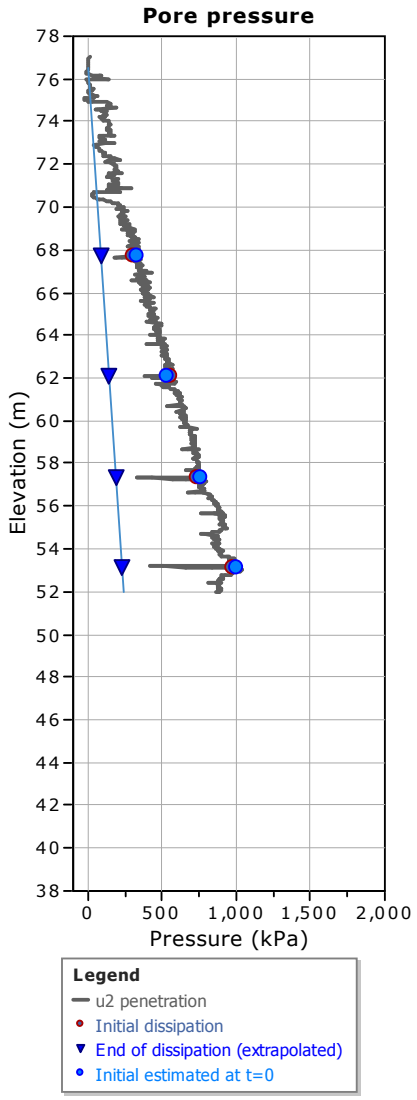

Piezocone Dissipation Test: 12-2-1 Rev 1
Depth: 14.92 (m)
u initial dissipation
assumed initial pore pressure, ui
u0 = 141.46 (kPa)
34.724
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-2-1 Rev 1
Depth: 19.68 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 188.16 (kPa)
24.708
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-2-1 Rev 1
Depth: 23.88 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 229.36 (kPa)
19.252
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

Dissipation Tests Results

Dissipation tests

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where:

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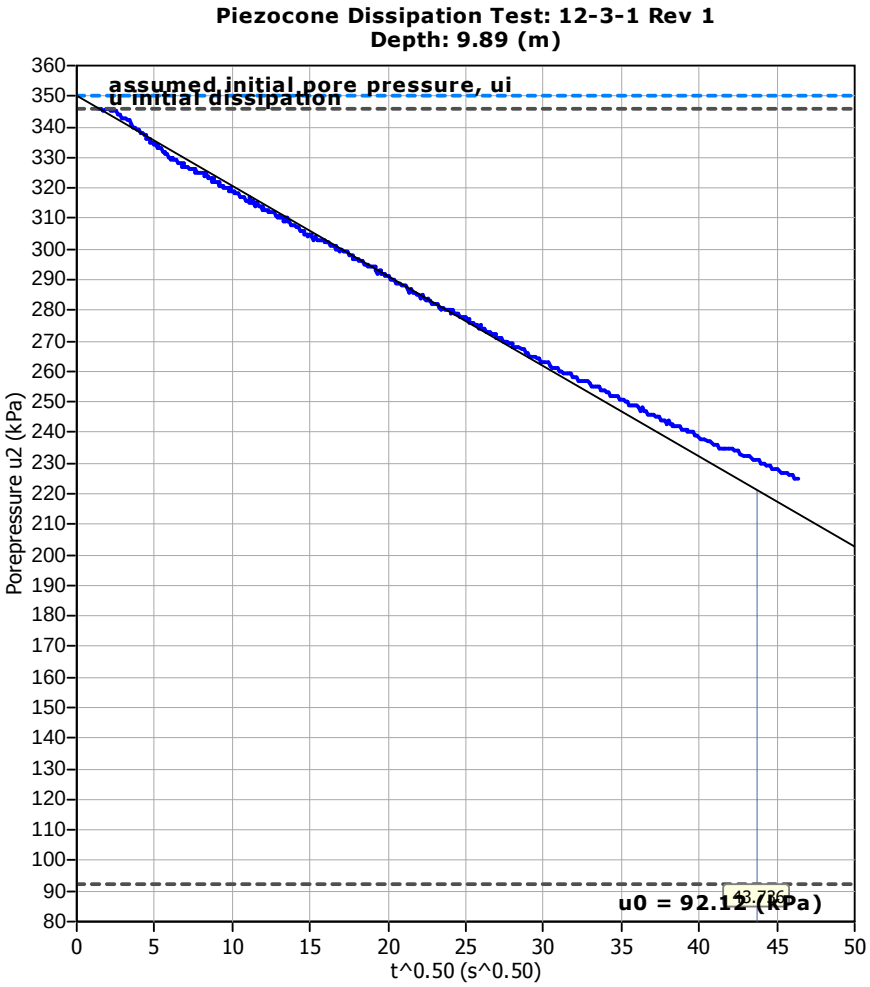
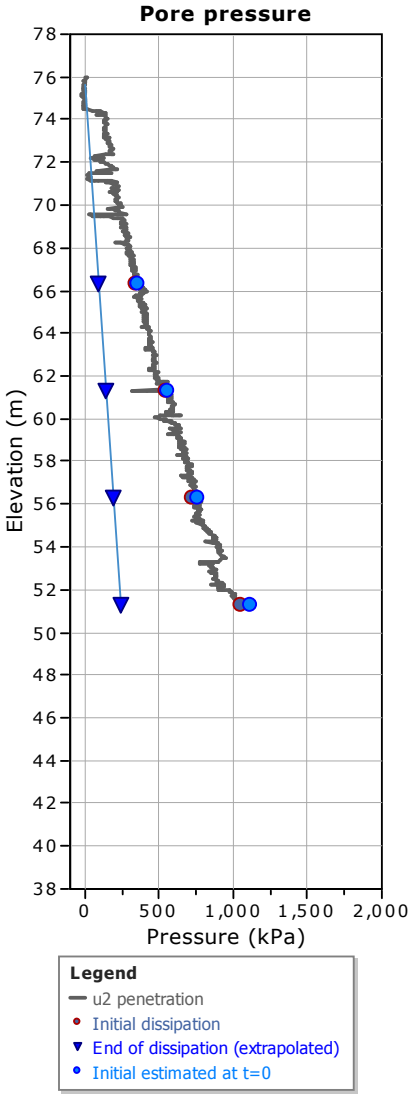
$$k_h = c_h \times \gamma_w / M$$

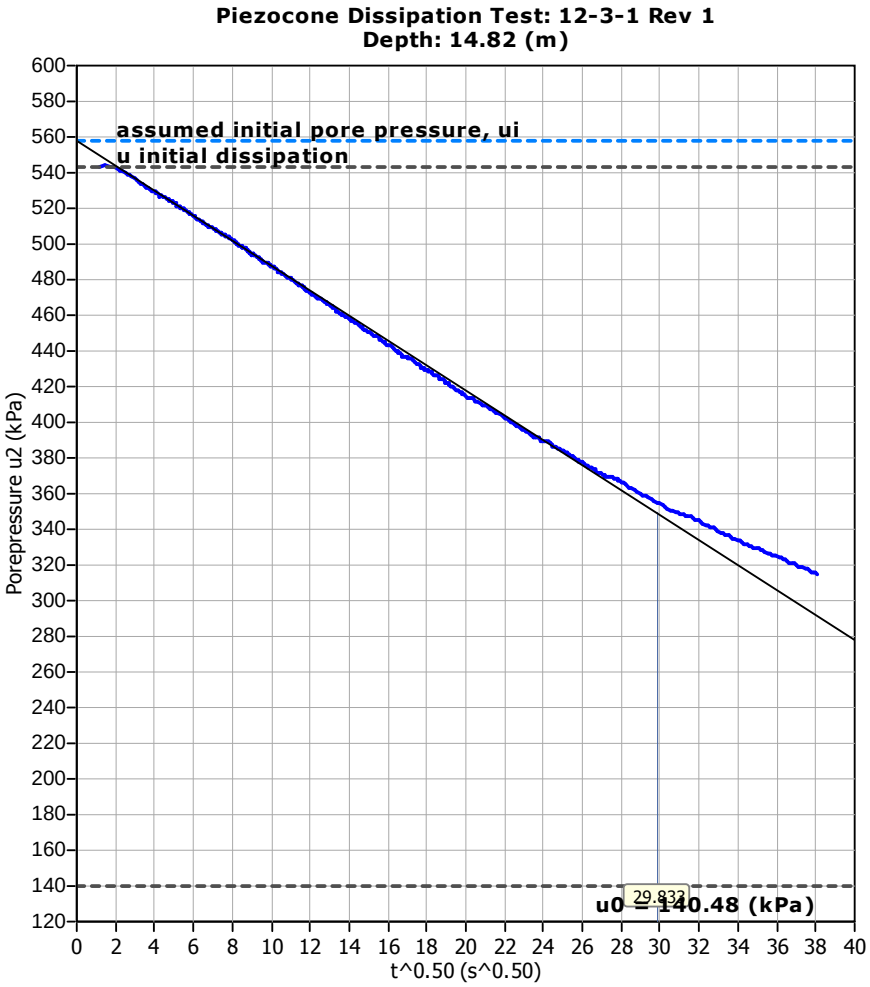
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

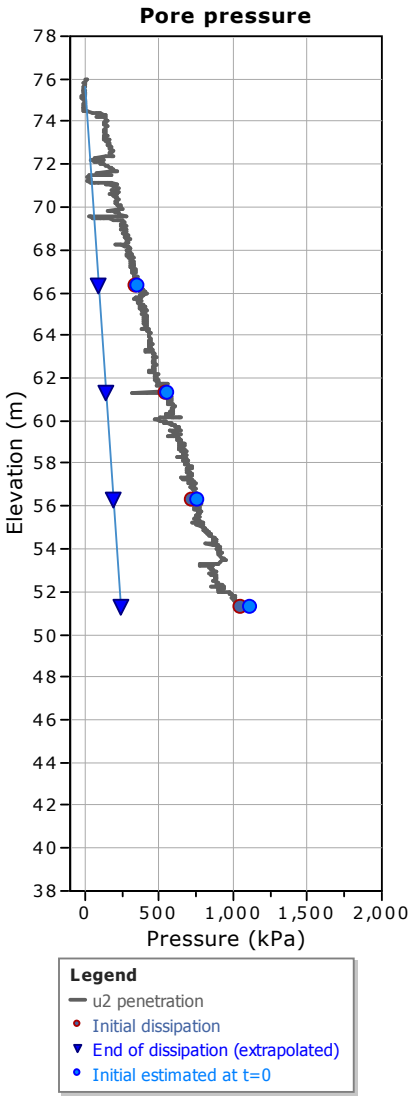
Tabular results

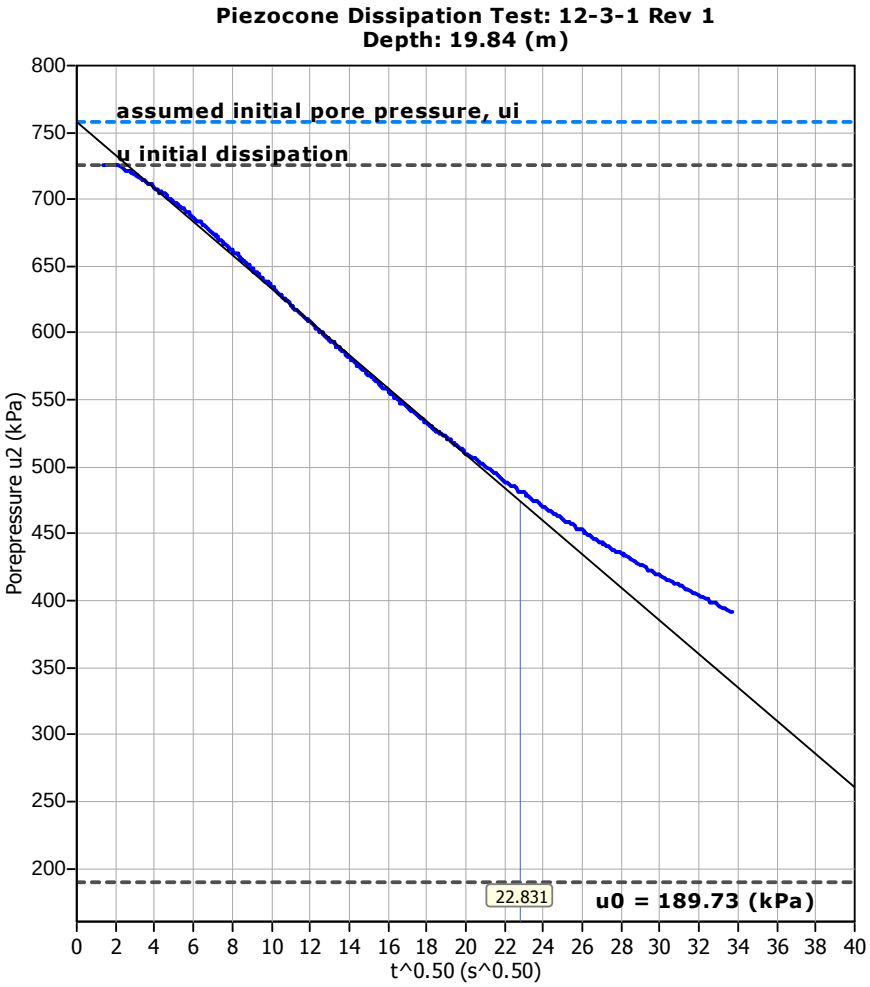
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
12-3-1 Rev 1	9.89	43.7	1913	6.07E-005	60.00	3.18E-007	10	2.51	1.24E-009
12-3-1 Rev 1	14.82	29.8	890	2.82E-005	62.00	6.95E-007	22	5.09	1.34E-009
12-3-1 Rev 1	19.84	22.8	521	1.65E-005	40.00	9.52E-007	30	6.55	1.43E-009
12-3-1 Rev 1	24.88	16.8	283	8.98E-006	55.00	2.06E-006	65	9.57	2.11E-009

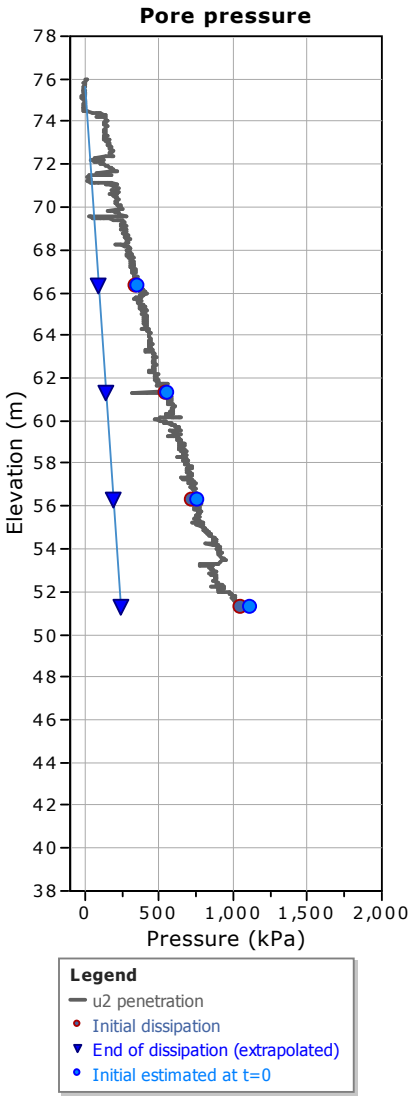

Piezocone Dissipation Test: 12-3-1 Rev 1
Depth: 9.89 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 92.12 (kPa)
Porepressure u2 (kPa)
t^0.50 (s^0.50)

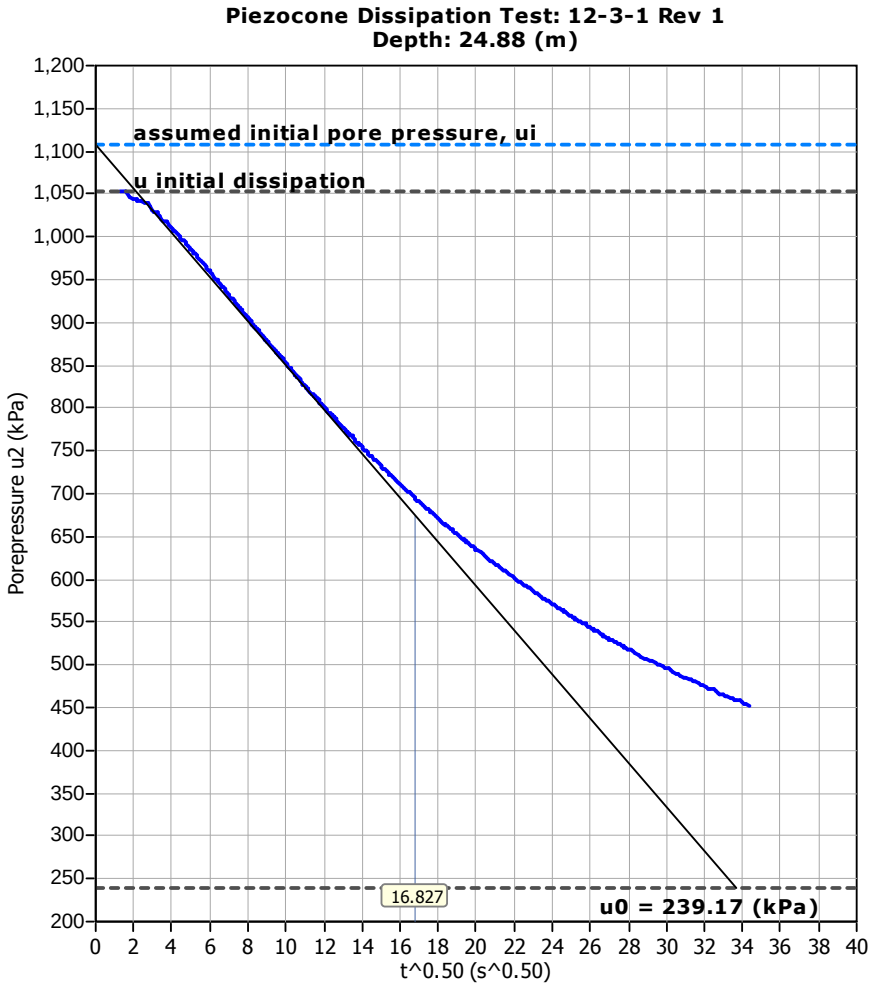

Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

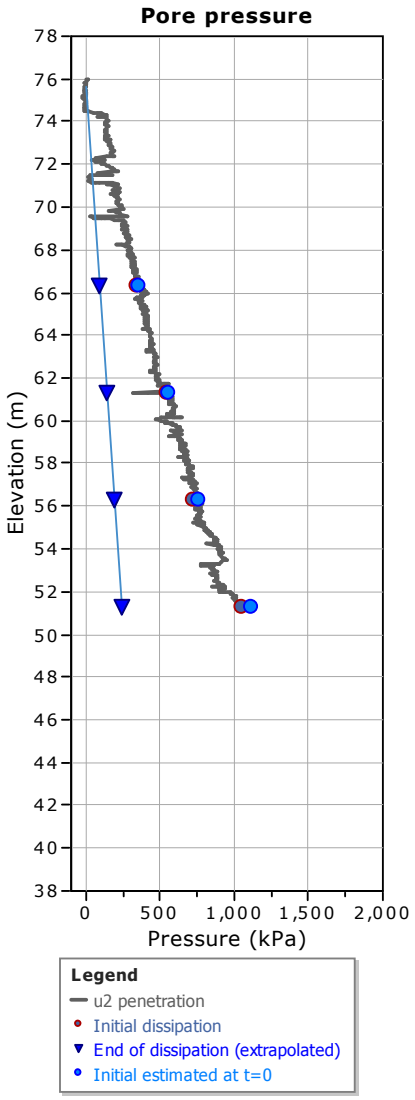

Piezocone Dissipation Test: 12-3-1 Rev 1
Depth: 14.82 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 140.48 (kPa)
29.832
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-3-1 Rev 1
Depth: 19.84 (m)
assumed initial pore pressure, ui
u initial dissipation
22.831
u0 = 189.73 (kPa)
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-3-1 Rev 1
Depth: 24.88 (m)
assumed initial pore pressure, ui
u initial dissipation
16.827
u0 = 239.17 (kPa)
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

Dissipation Tests Results

Dissipation tests

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The porepressures are plotted as a function of square root of (t). The graphical technique suggested by Robertson and Campanella (1989), yields a value for t_{50}, which corresponds to the time for 50% consolidation.

The value of the coefficient of consolidation in the radial or horizontal direction c_h was then calculated by Houlsby and Teh's (1988) theory using the following equation:

$$c_h = \frac{T \times r^2 \times I_r^{0.5}}{t_{50}}$$

where:

T: time factor given by Houlsby and Teh's (1988) theory corresponding to the porepressure position
r: piezocone radius
I_r: stiffness index, equal to shear modulus G divided by the undrained strength of clay (S_u).
t_{50}: time corresponding to 50% consolidation

Permeability estimates based on dissipation test

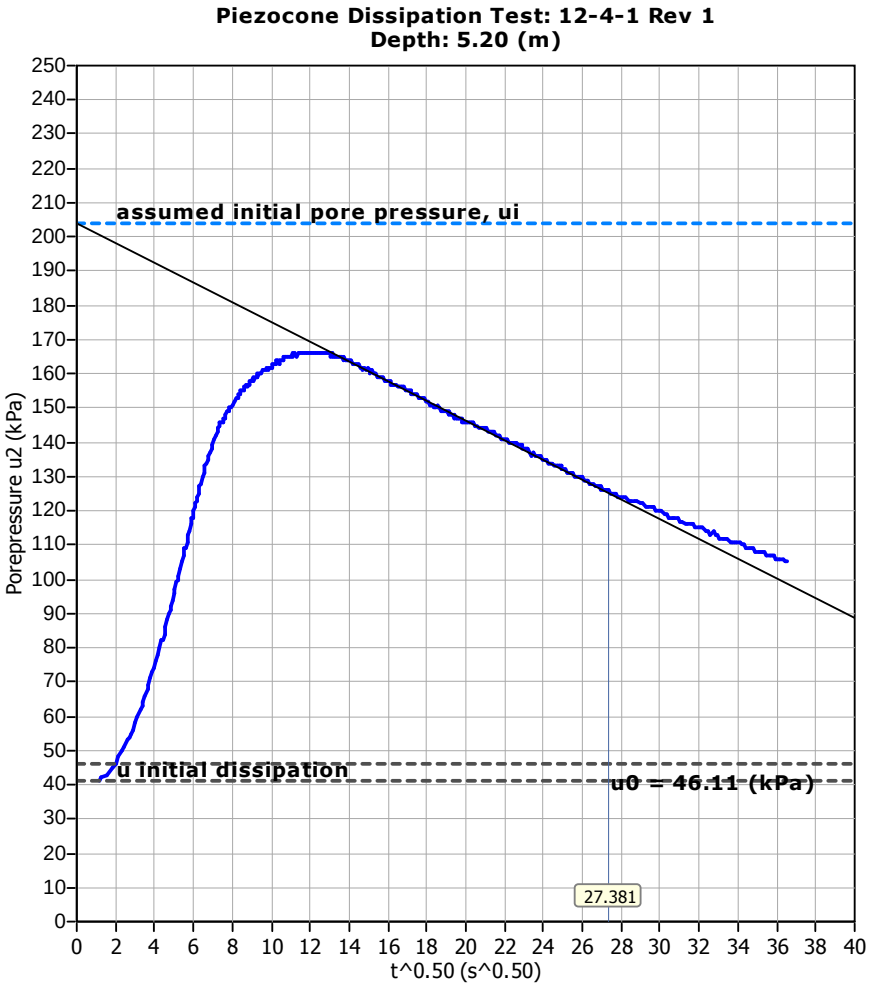
The dissipation of pore pressures during a CPTu dissipation test is controlled by the coefficient of consolidation in the horizontal direction (c_h) which is influenced by a combination of the soil permeability (k_h) and compressibility (M), as defined by the following:

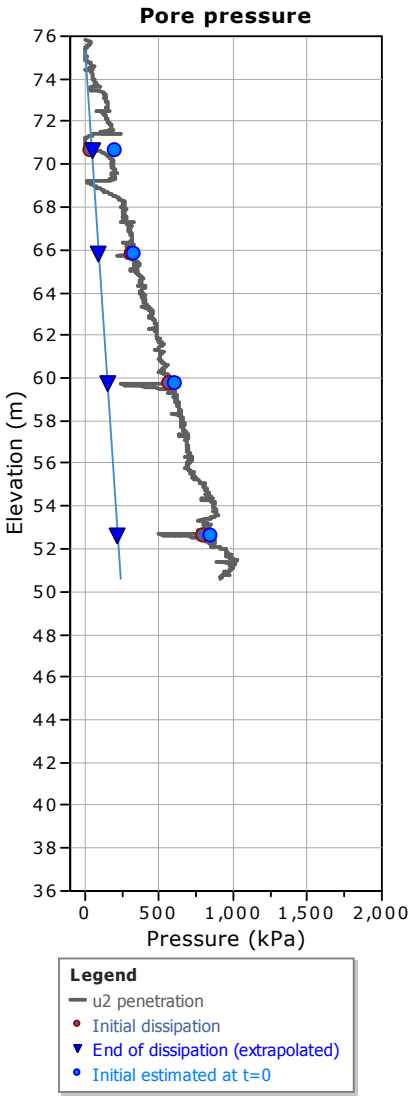
$$k_h = c_h \times \gamma_w / M$$

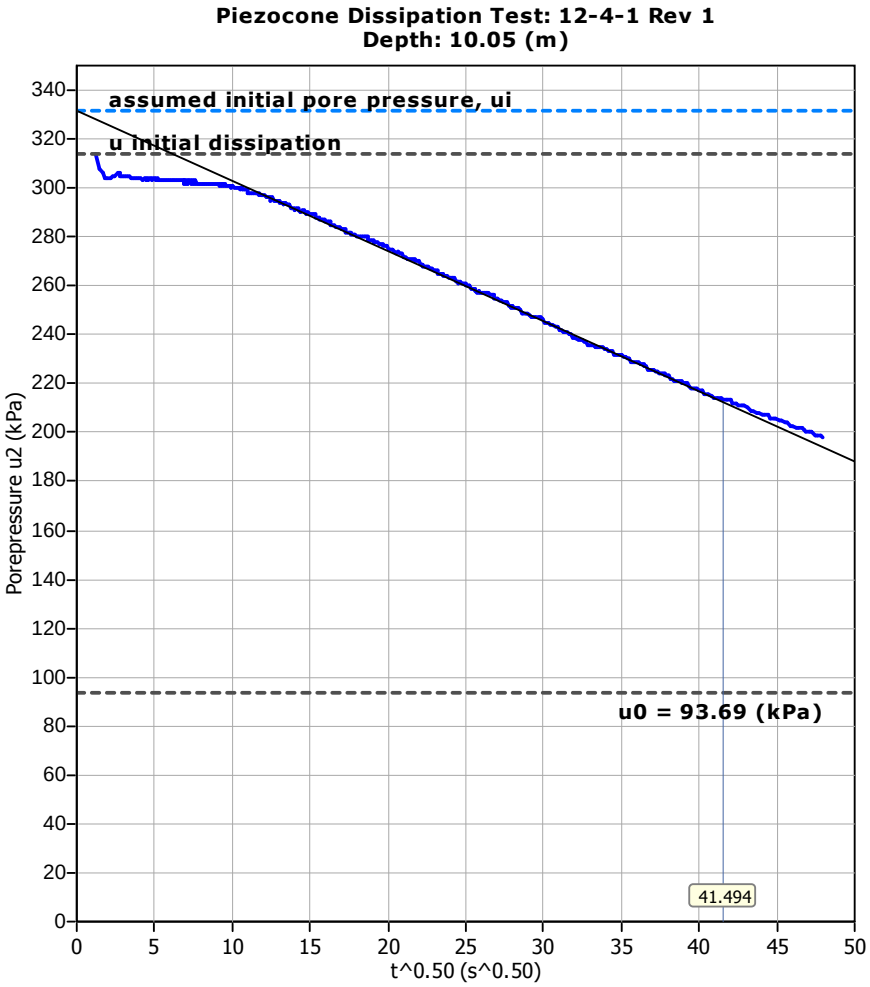
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

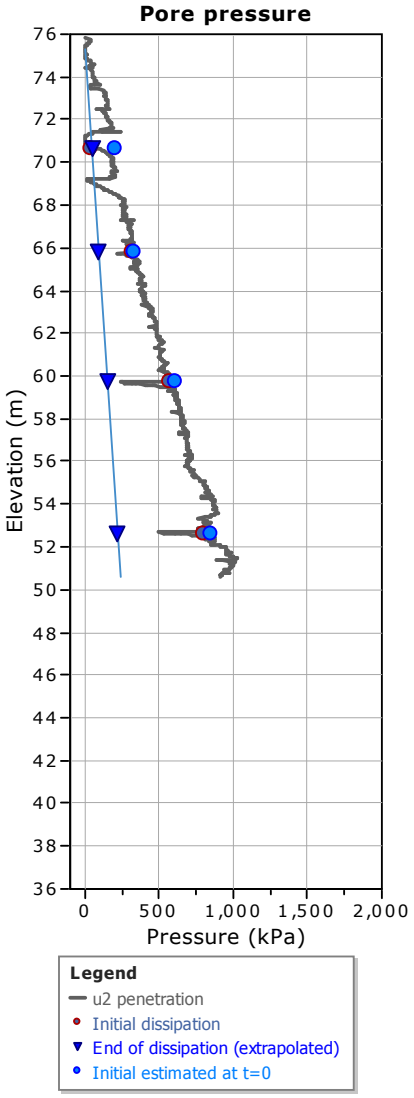
Tabular results

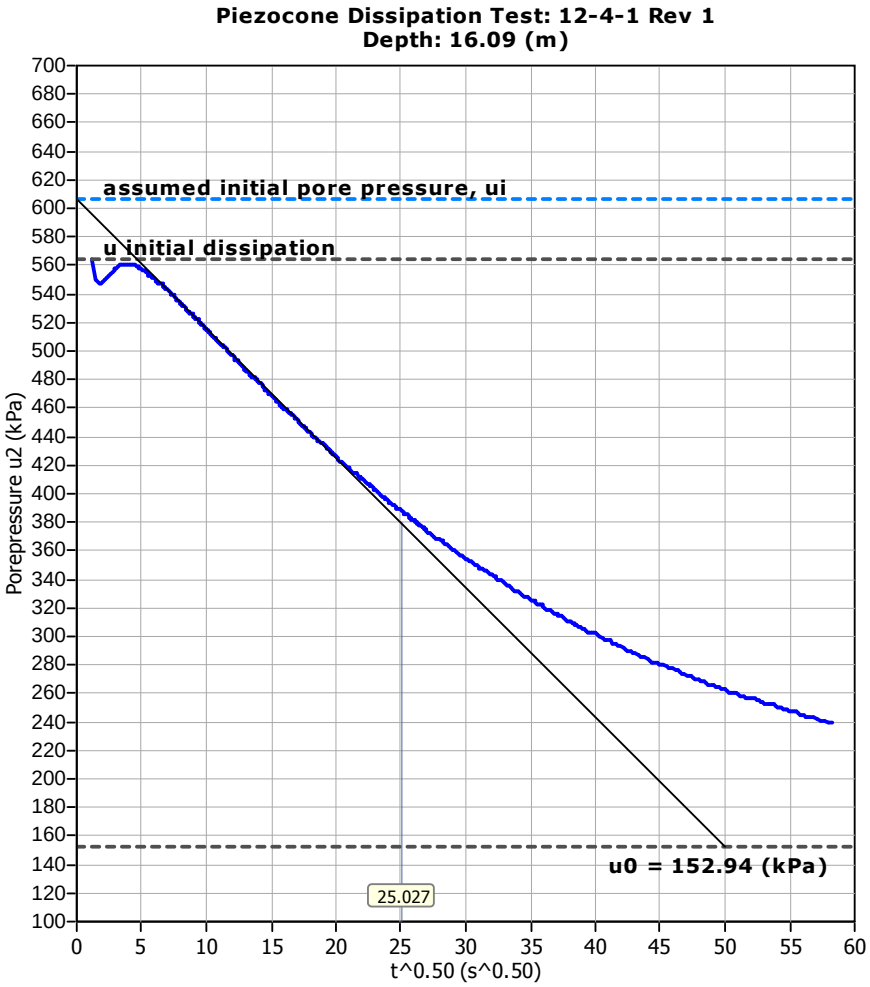
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
12-4-1 Rev 1	5.20	27.4	750	2.38E-005	35.00	6.19E-007	20	0.43	1.43E-008
12-4-1 Rev 1	10.05	41.5	1722	5.46E-005	60.00	3.53E-007	11	2.26	1.53E-009
12-4-1 Rev 1	16.09	25.0	626	1.99E-005	66.00	1.02E-006	32	3.27	3.06E-009
12-4-1 Rev 1	23.17	25.3	640	2.03E-005	60.00	9.50E-007	30	4.84	1.93E-009

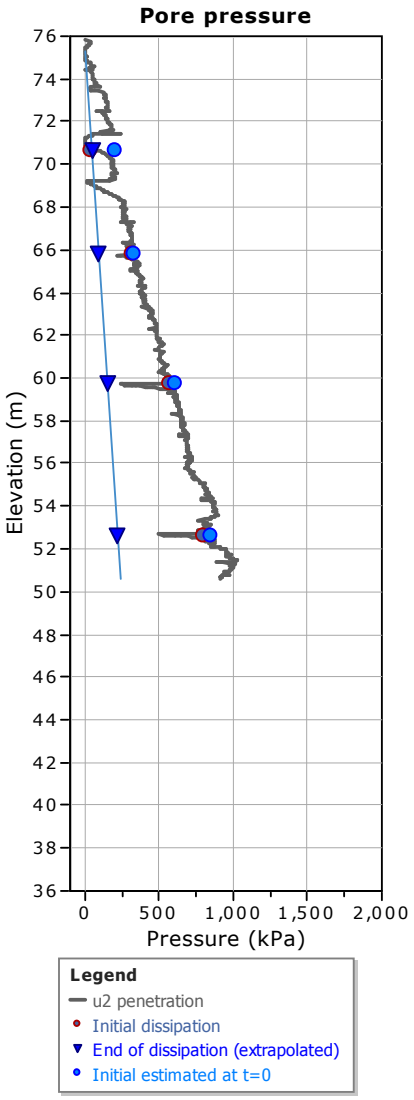

Piezocone Dissipation Test: 12-4-1 Rev 1
Depth: 5.20 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 46.11 (kPa)
27.381
Porepressure u2 (kPa)
t^0.50 (s^0.50)

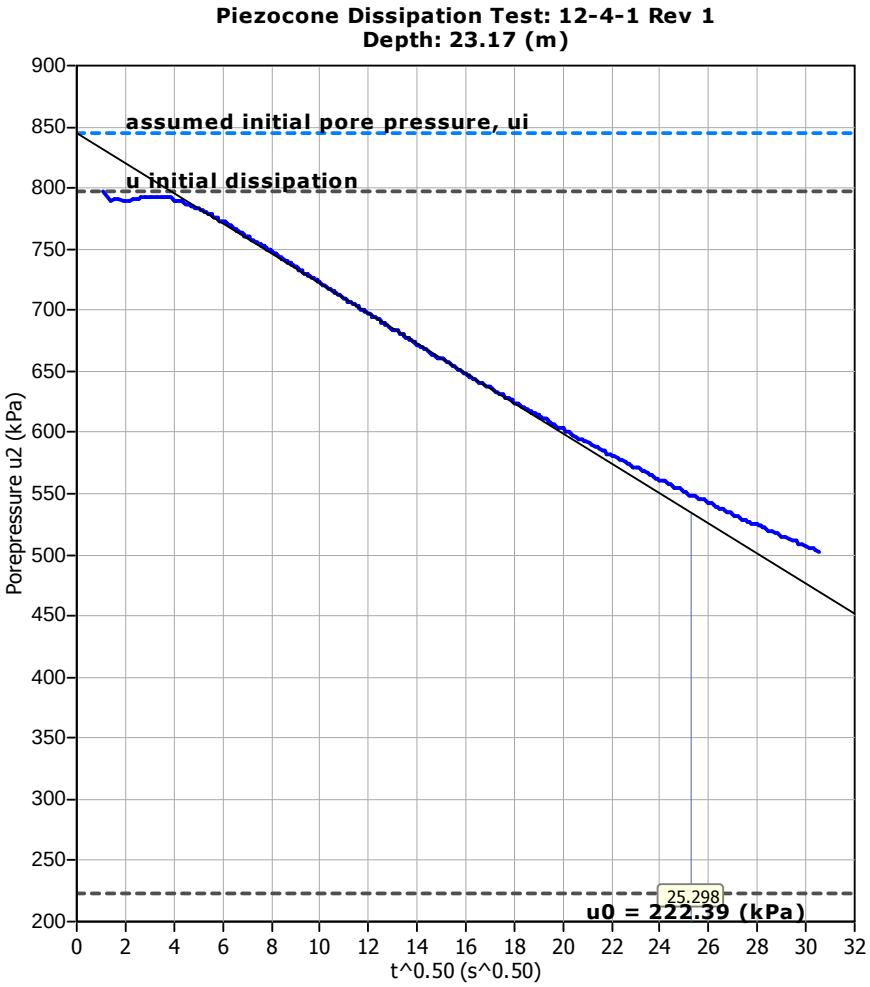

Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

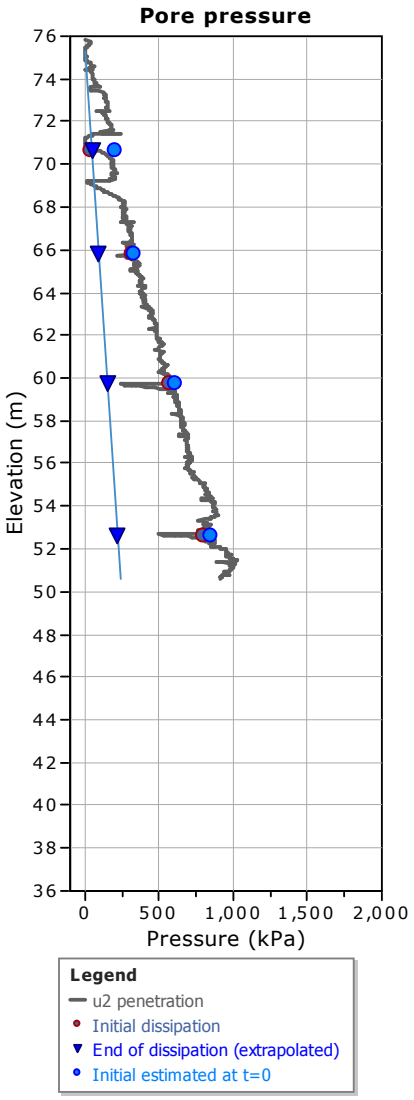

Piezocone Dissipation Test: 12-4-1 Rev 1
Depth: 10.05 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 93.69 (kPa)
41.494
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-4-1 Rev 1
Depth: 16.09 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 152.94 (kPa)
25.027
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 12-4-1 Rev 1
Depth: 23.17 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 222.39 (kPa)
25.298
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

Dissipation Tests Results

Dissipation tests

Dissipation tests consists of stopping the piezocone penetration and observing porepressures (u) with elapsed time (t). The data are automatic recorded by the field computer and should take place until a minimum of 50% dissipation.

The porepressures are plotted as a function of square root of (t). The graphical technique suggested by Robertson and Campanella (1989), yields a value for t_{50}, which corresponds to the time for 50% consolidation.

The value of the coefficient of consolidation in the radial or horizontal direction c_h was then calculated by Houlsby and Teh's (1988) theory using the following equation:

$$c_h = \frac{T \times r^2 \times I_r^{0.5}}{t_{50}}$$

where:

T: time factor given by Houlsby and Teh's (1988) theory corresponding to the porepressure position
r: piezocone radius
I_r: stiffness index, equal to shear modulus G divided by the undrained strength of clay (S_u).
t_{50}: time corresponding to 50% consolidation

Permeability estimates based on dissipation test

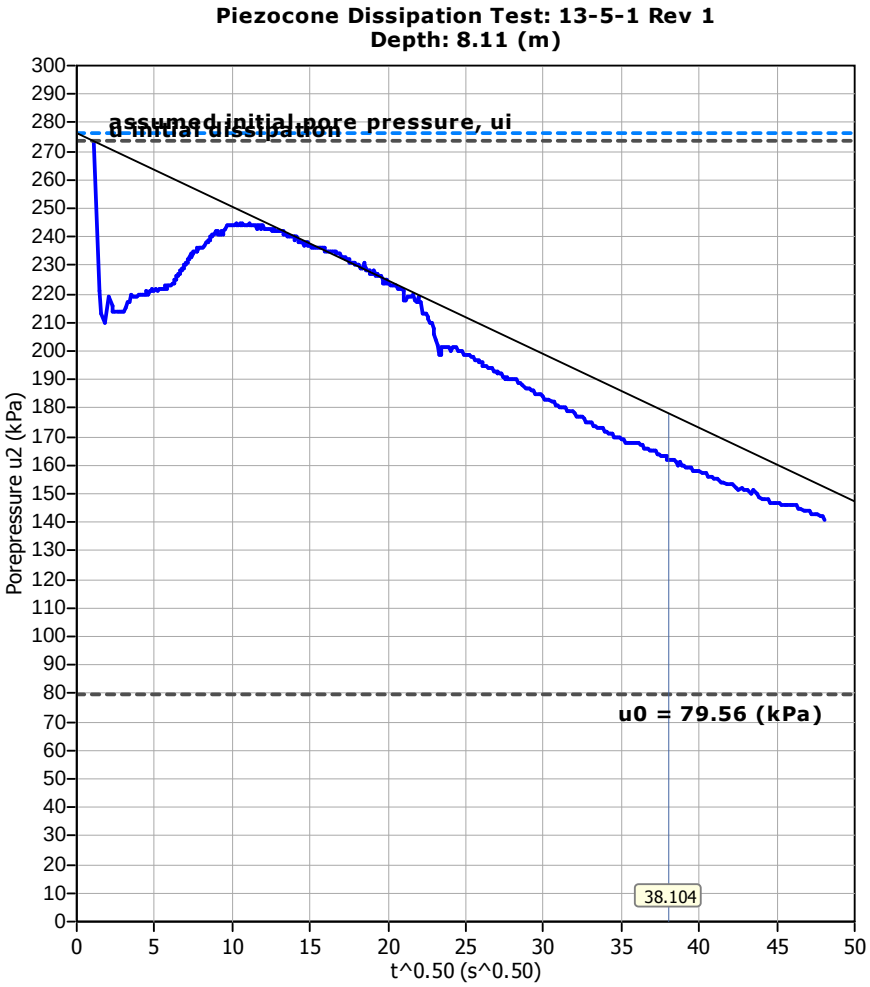
The dissipation of pore pressures during a CPTu dissipation test is controlled by the coefficient of consolidation in the horizontal direction (c_h) which is influenced by a combination of the soil permeability (k_h) and compressibility (M), as defined by the following:

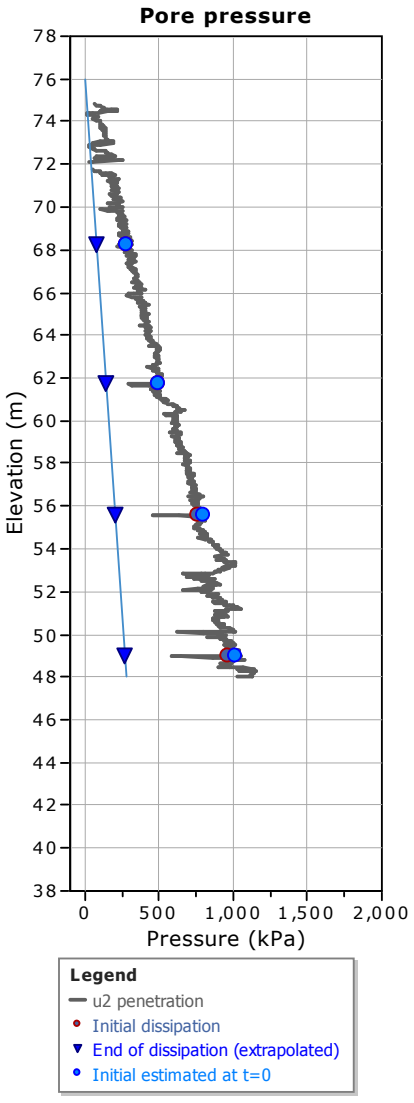
$$k_h = c_h \times \gamma_w / M$$

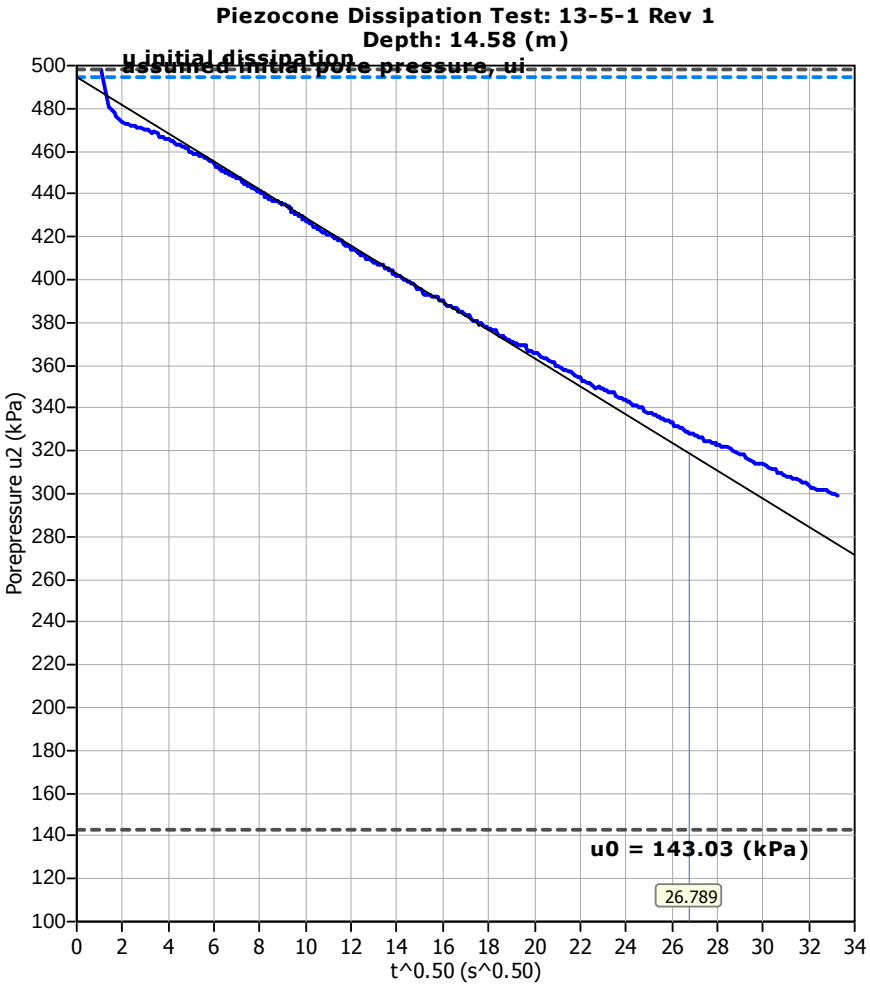
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

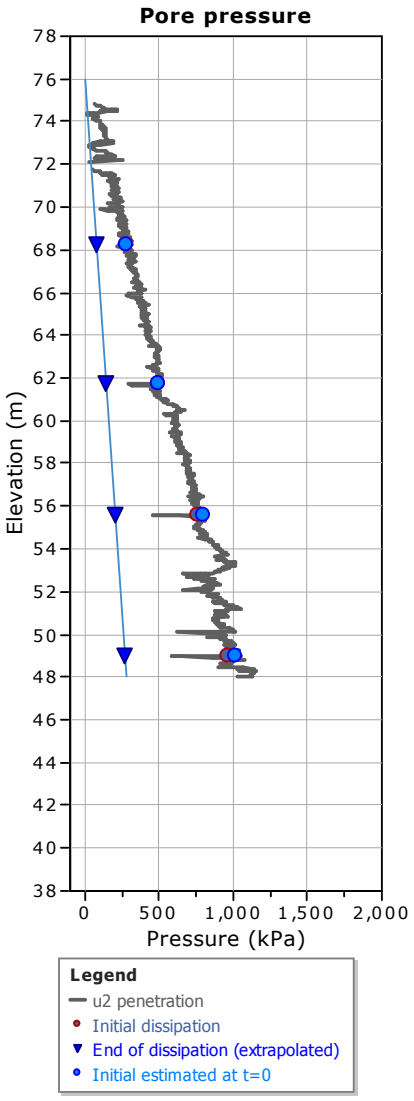
Tabular results

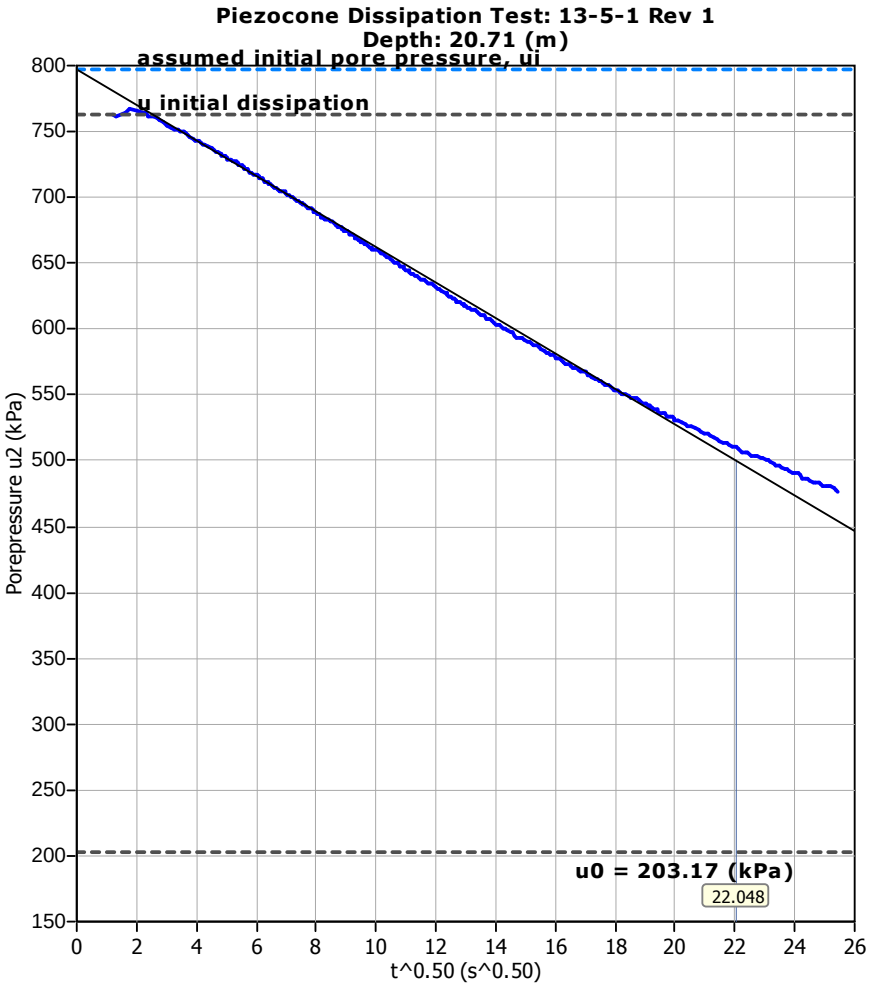
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
13-5-1 Rev 1	8.11	38.1	1452	4.60E-005	48.00	3.75E-007	12	1.13	3.24E-009
13-5-1 Rev 1	14.58	26.8	718	2.28E-005	56.00	8.19E-007	26	2.46	3.26E-009
13-5-1 Rev 1	20.71	22.0	486	1.54E-005	51.00	1.15E-006	36	3.97	2.85E-009
13-5-1 Rev 1	27.35	21.7	472	1.50E-005	104.00	1.70E-006	53	6.90	2.41E-009

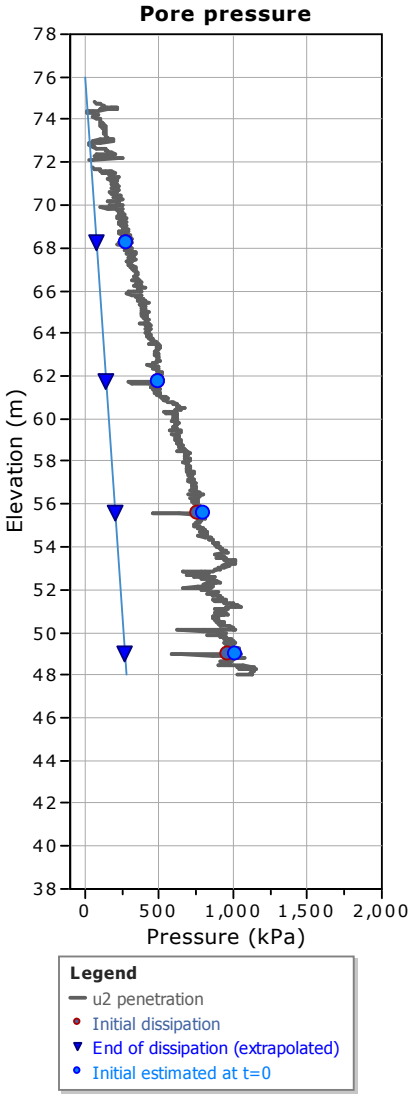

Piezocone Dissipation Test: 13-5-1 Rev 1
Depth: 8.11 (m)
assumed initial pore pressure, ui
u-initial dissipation
u0 = 79.56 (kPa)
38.104
Porepressure u2 (kPa)
t^0.50 (s^0.50)

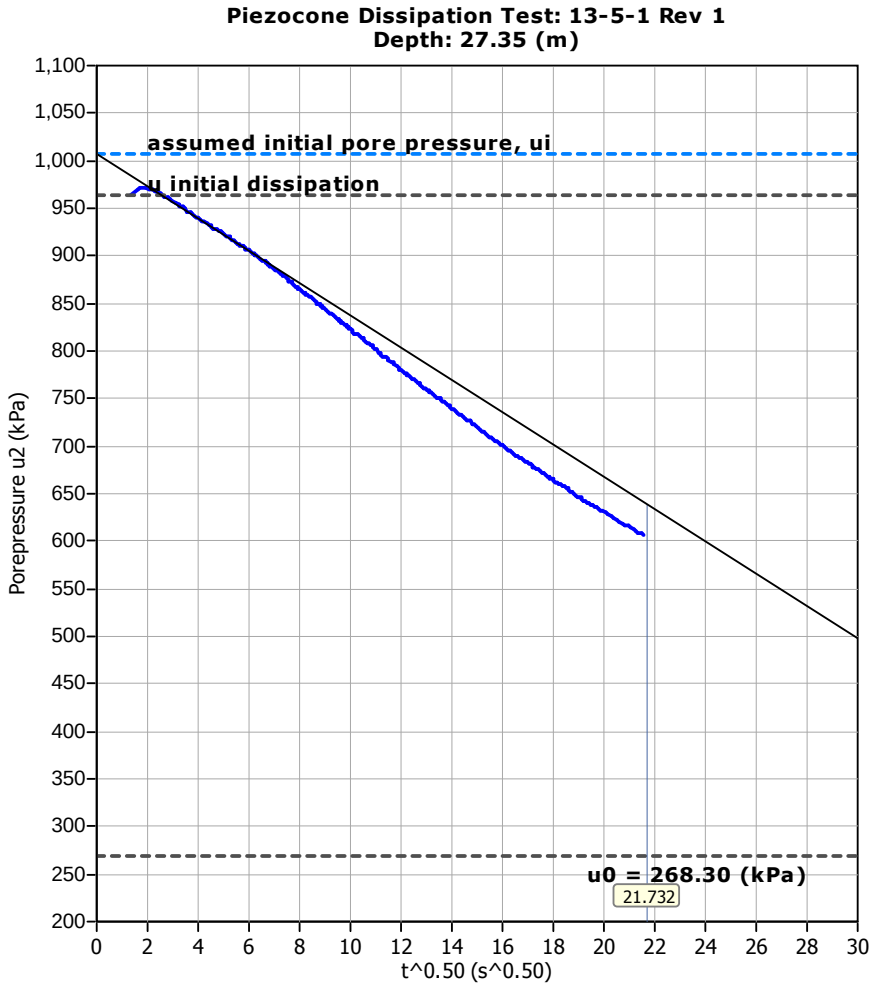

Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

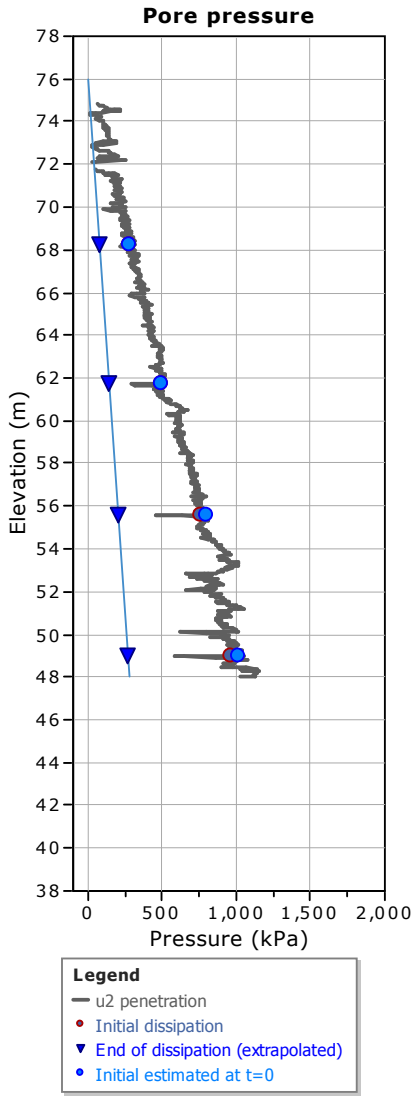

Piezocone Dissipation Test: 13-5-1 Rev 1
Depth: 14.58 (m)
u initial dissipation
assumed initial pore pressure, ui
u0 = 143.03 (kPa)
26.789
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 13-5-1 Rev 1
Depth: 20.71 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 203.17 (kPa)
22.048
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 13-5-1 Rev 1
Depth: 27.35 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 268.30 (kPa)
21.732
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

Dissipation Tests Results

Dissipation tests

Dissipation tests consists of stopping the piezocone penetration and observing porepressures (u) with elapsed time (t). The data are automatic recorded by the field computer and should take place until a minimum of 50% dissipation.

The porepressures are plotted as a function of square root of (t). The graphical technique suggested by Robertson and Campanella (1989), yields a value for t_{50}, which corresponds to the time for 50% consolidation.

The value of the coefficient of consolidation in the radial or horizontal direction c_h was then calculated by Houlsby and Teh's (1988) theory using the following equation:

$$c_h = \frac{T \times r^2 \times I_r^{0.5}}{t_{50}}$$

where:

T: time factor given by Houlsby and Teh's (1988) theory corresponding to the porepressure position
r: piezocone radius
I_r: stiffness index, equal to shear modulus G divided by the undrained strength of clay (S_u).
t_{50}: time corresponding to 50% consolidation

Permeability estimates based on dissipation test

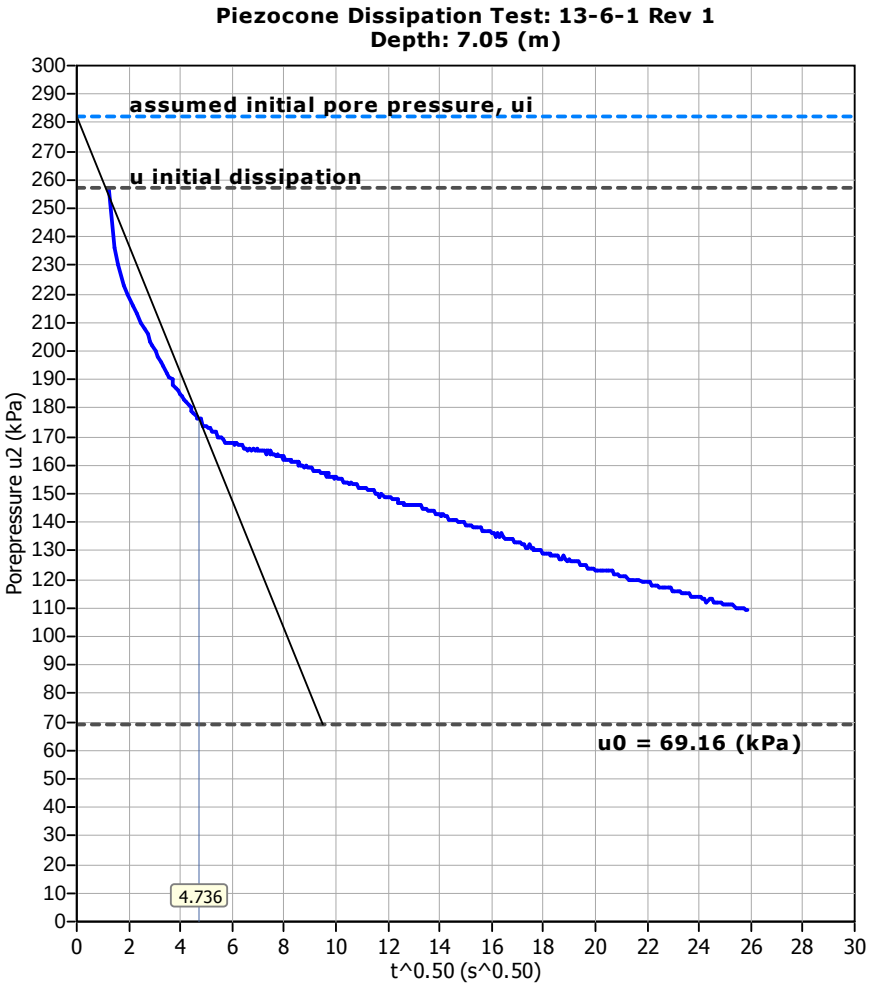
The dissipation of pore pressures during a CPTu dissipation test is controlled by the coefficient of consolidation in the horizontal direction (c_h) which is influenced by a combination of the soil permeability (k_h) and compressibility (M), as defined by the following:

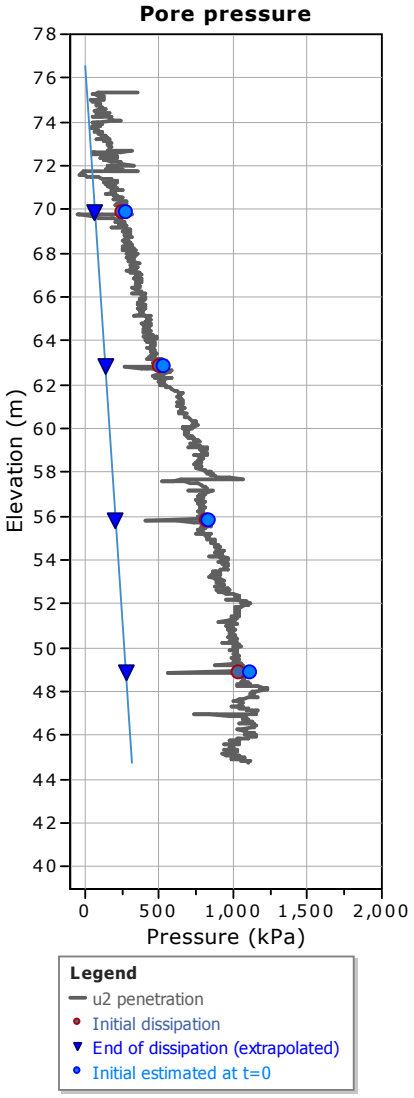
$$k_h = c_h \times \gamma_w / M$$

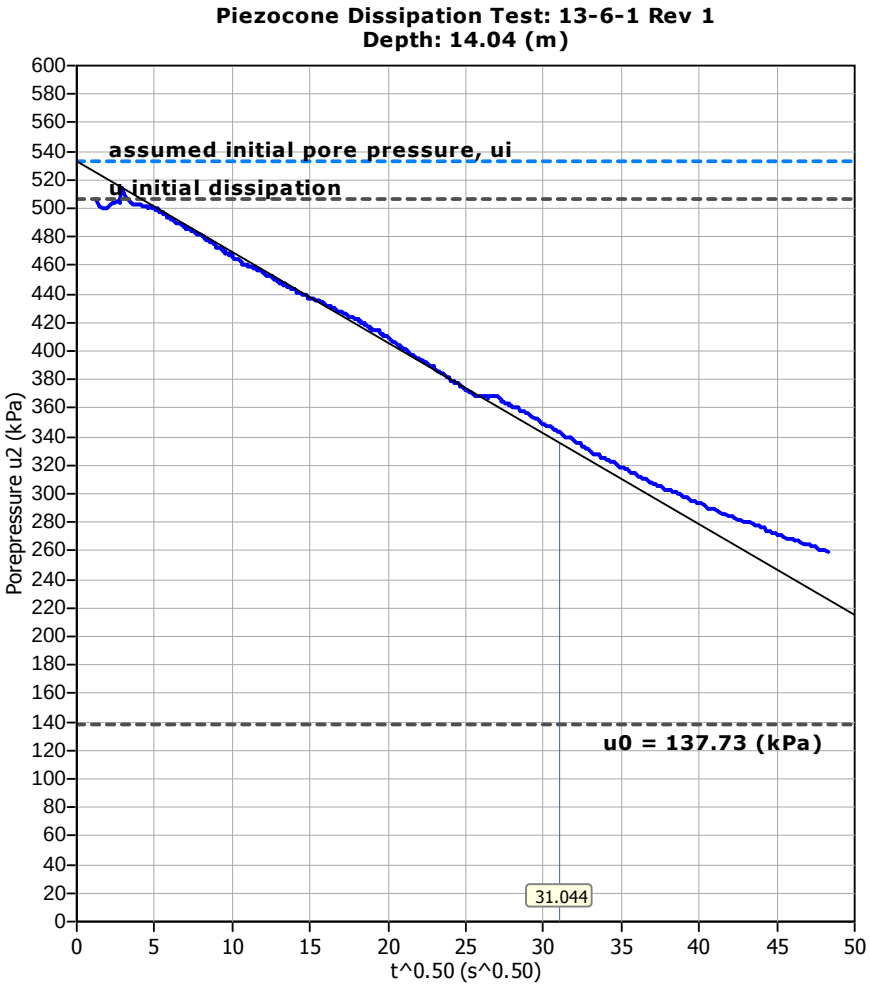
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

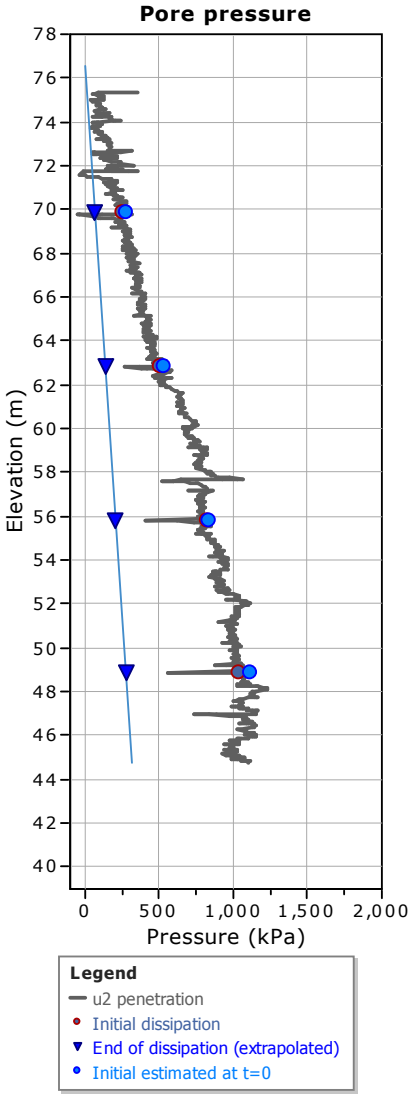
Tabular results

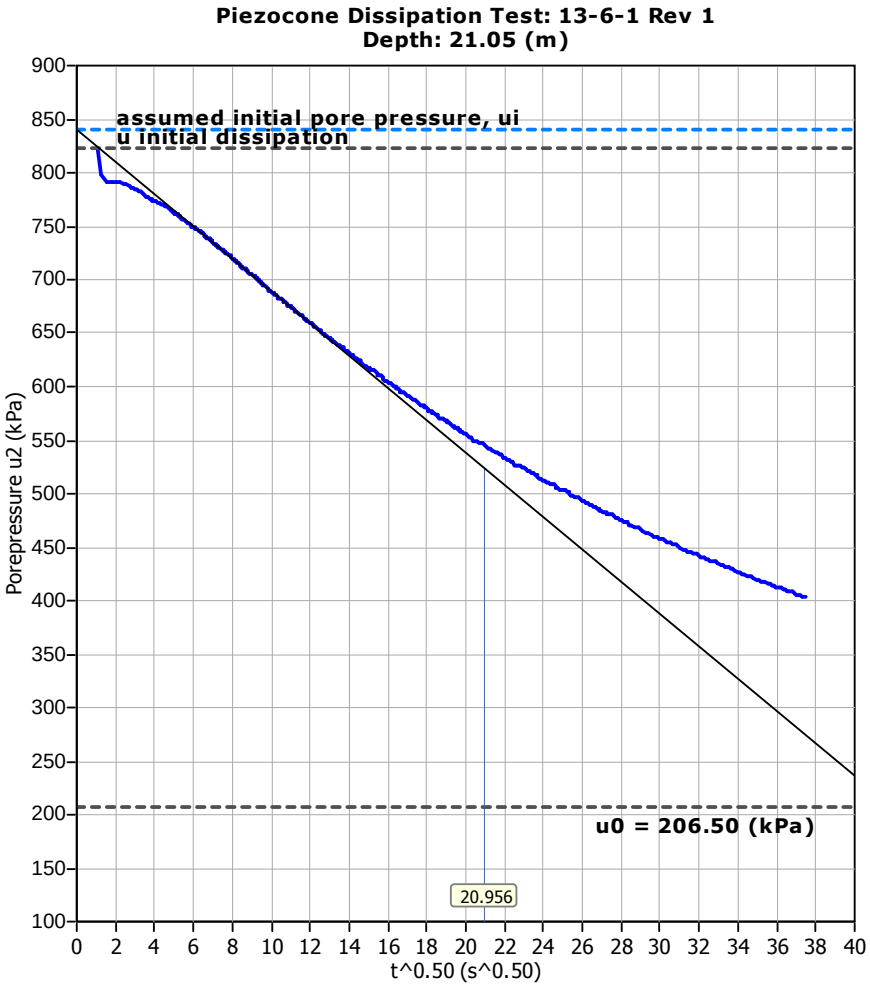
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
13-6-1 Rev 1	7.05	4.7	22	7.11E-007	72.00	2.97E-005	936	1.61	1.81E-007
13-6-1 Rev 1	14.04	31.0	964	3.06E-005	55.00	6.04E-007	19	3.35	1.77E-009
13-6-1 Rev 1	21.05	21.0	439	1.39E-005	52.00	1.29E-006	41	3.31	3.82E-009
13-6-1 Rev 1	28.05	20.1	402	1.28E-005	92.00	1.87E-006	59	4.97	3.70E-009

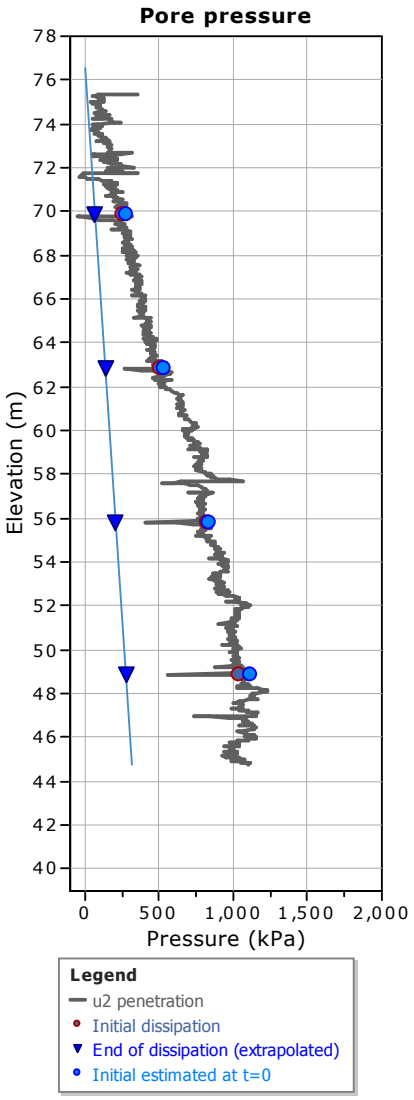

Piezocone Dissipation Test: 13-6-1 Rev 1
Depth: 7.05 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 69.16 (kPa)
4.736
Porepressure u2 (kPa)
t^0.50 (s^0.50)

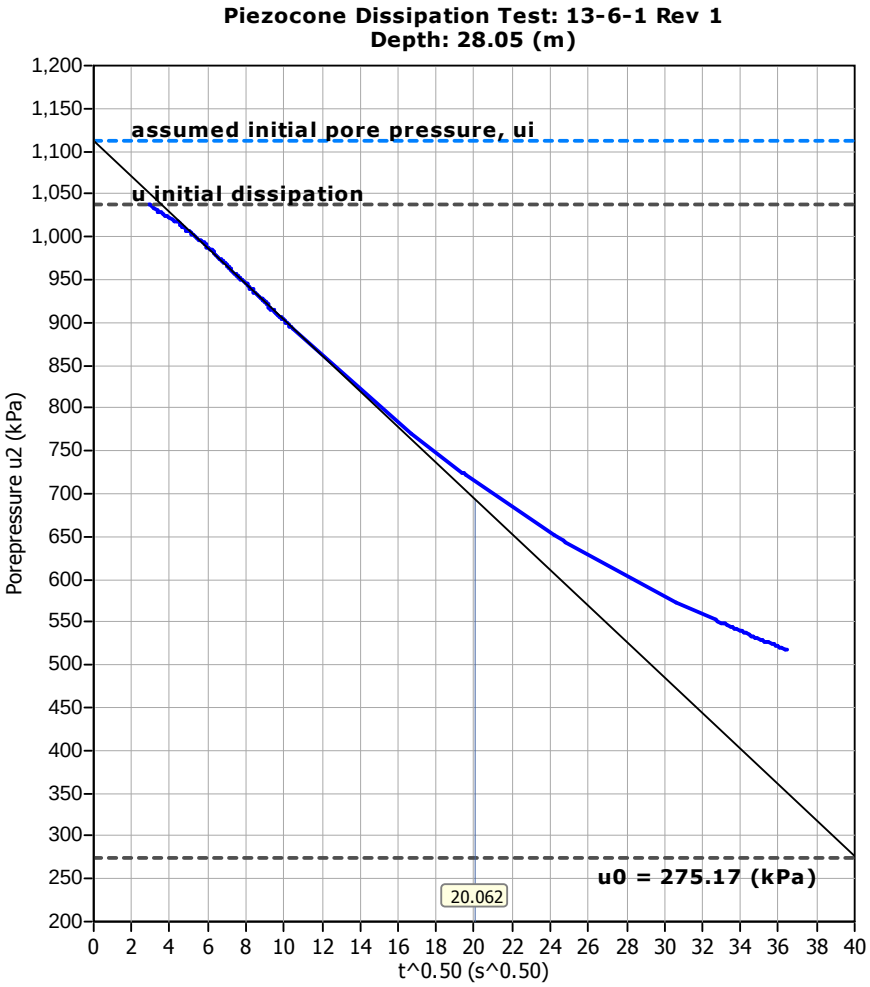

Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

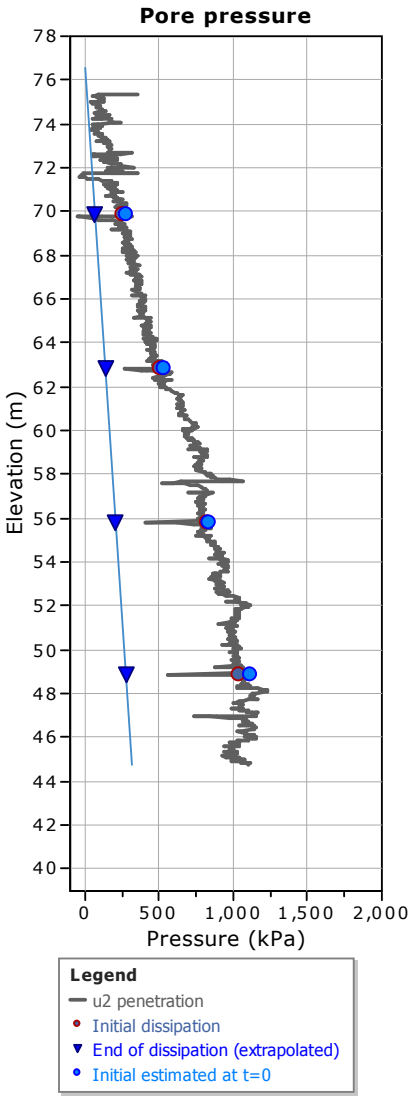

Piezocone Dissipation Test: 13-6-1 Rev 1
Depth: 14.04 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 137.73 (kPa)
31.044
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 13-6-1 Rev 1
Depth: 21.05 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 206.50 (kPa)
20.956
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 13-6-1 Rev 1
Depth: 28.05 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 275.17 (kPa)
20.062
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0

Dissipation Tests Results

Dissipation tests

Dissipation tests consists of stopping the piezocone penetration and observing porepressures (u) with elapsed time (t). The data are automatic recorded by the field computer and should take place until a minimum of 50% dissipation.

The porepressures are plotted as a function of square root of (t). The graphical technique suggested by Robertson and Campanella (1989), yields a value for t_{50}, which corresponds to the time for 50% consolidation.

The value of the coefficient of consolidation in the radial or horizontal direction c_h was then calculated by Houlsby and Teh's (1988) theory using the following equation:

$$c_h = \frac{T \times r^2 \times I_r^{0.5}}{t_{50}}$$

where:

T: time factor given by Houlsby and Teh's (1988) theory corresponding to the porepressure position
r: piezocone radius
I_r: stiffness index, equal to shear modulus G divided by the undrained strength of clay (S_u).
t_{50}: time corresponding to 50% consolidation

Permeability estimates based on dissipation test

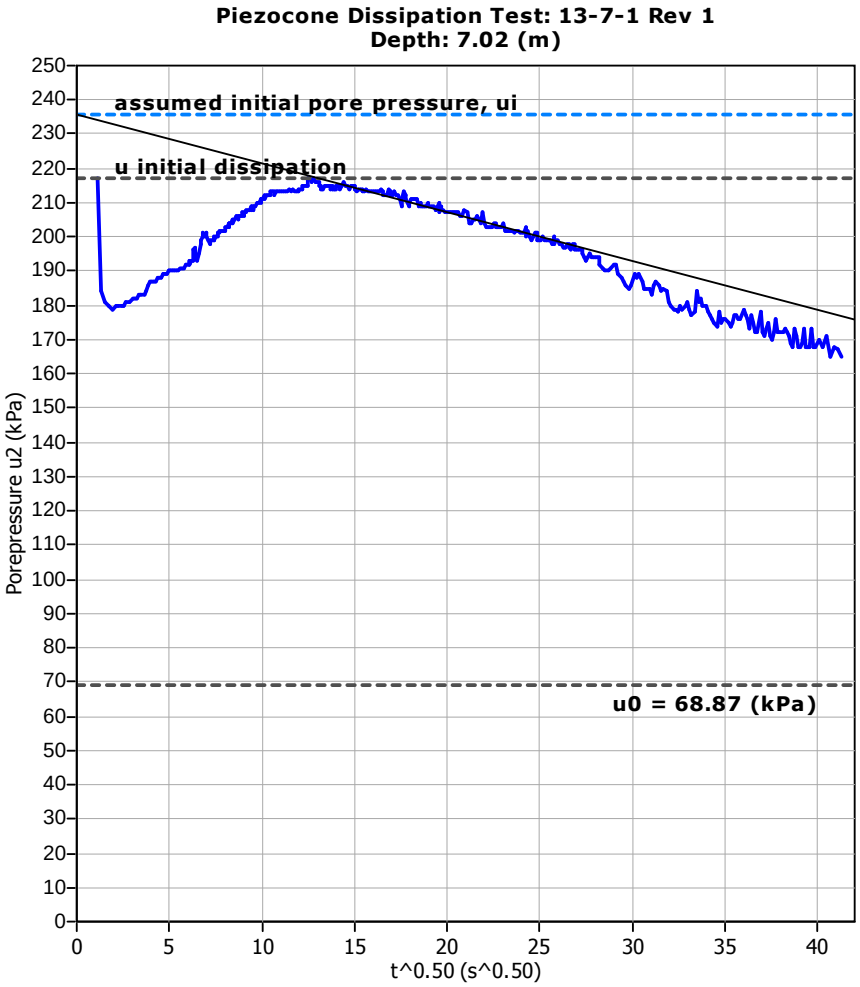
The dissipation of pore pressures during a CPTu dissipation test is controlled by the coefficient of consolidation in the horizontal direction (c_h) which is influenced by a combination of the soil permeability (k_h) and compressibility (M), as defined by the following:

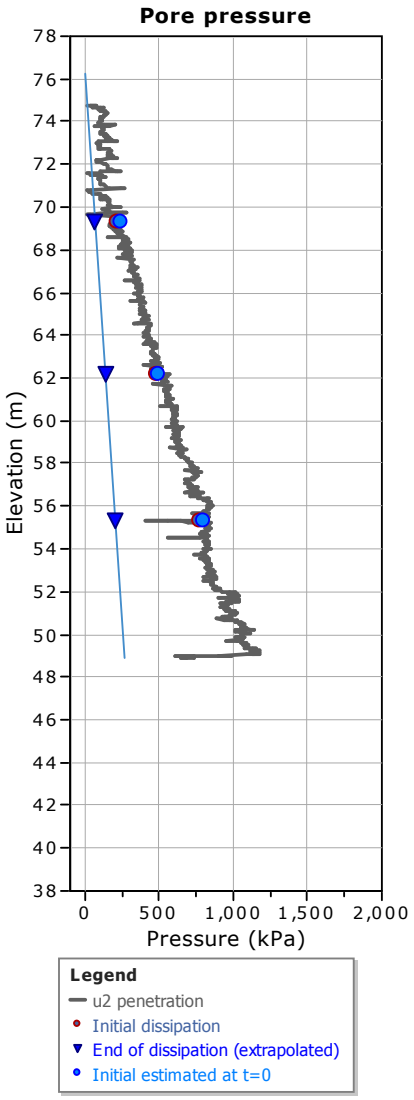
$$k_h = c_h \times \gamma_w / M$$

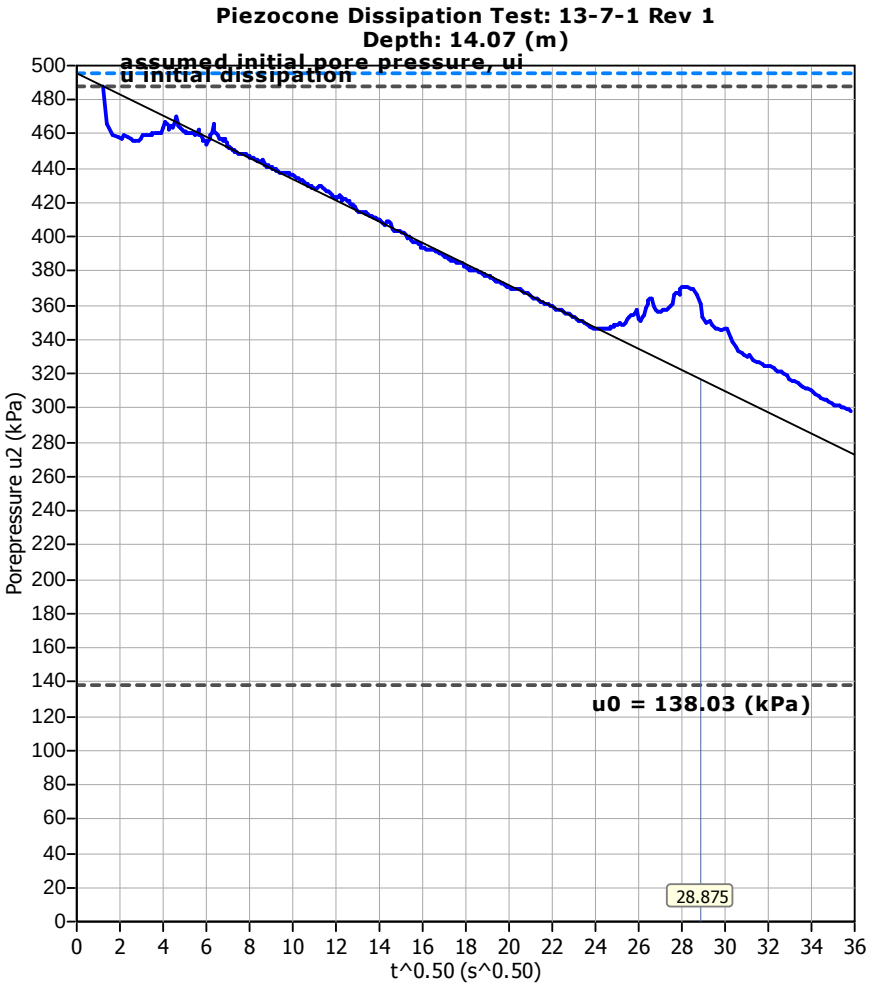
where: M is the 1-D constrained modulus and γ_w is the unit weight of water, in compatible units.

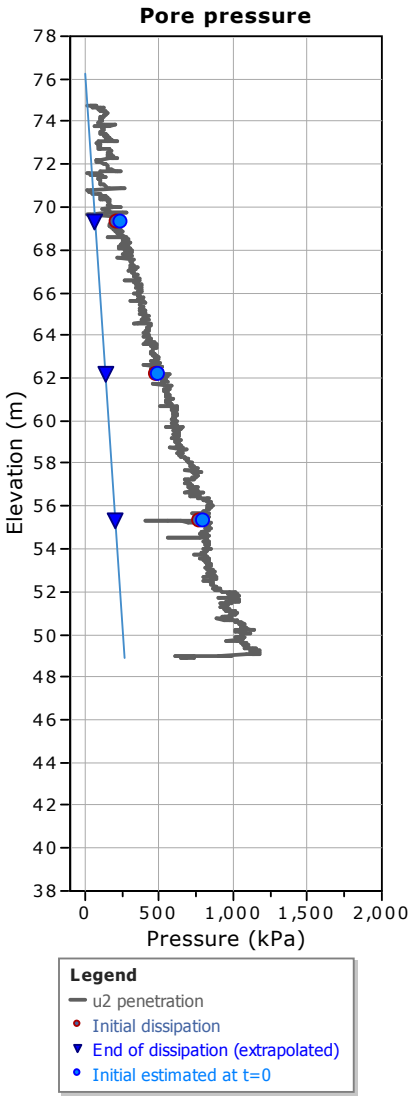
Tabular results

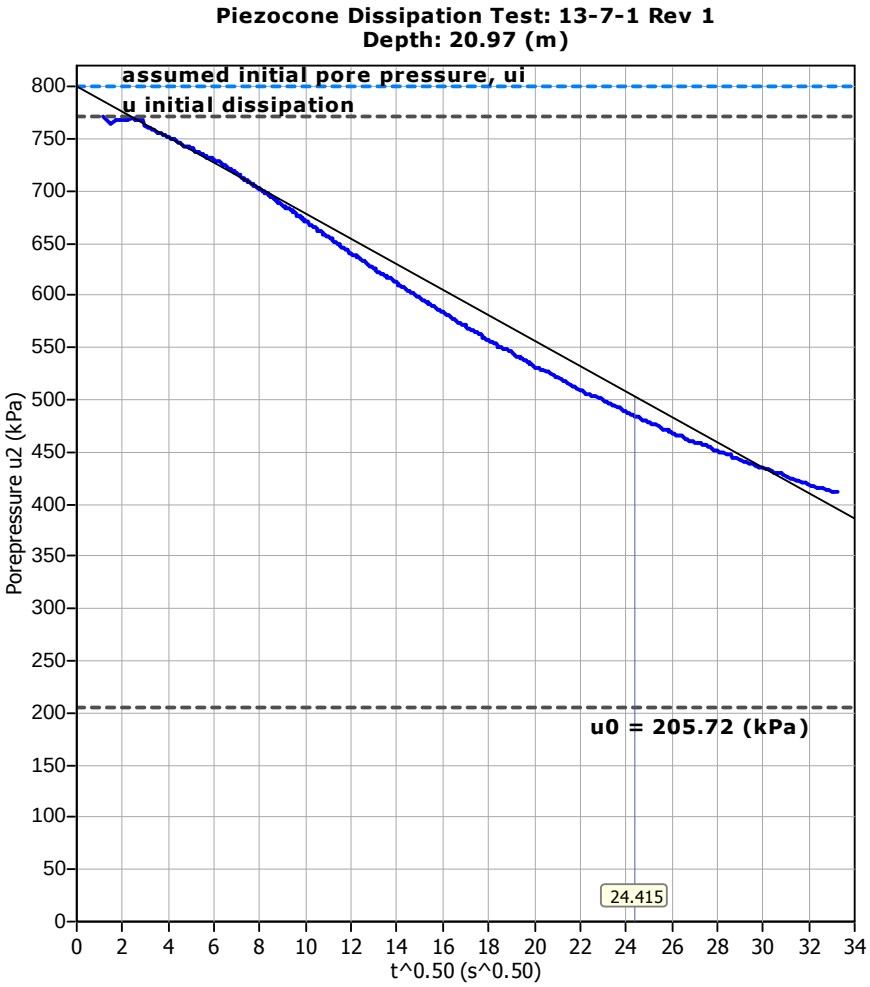
CPTU Borehole	Depth (m)	$(t_{50})^{0.50}$	t_{50} (s)	t_{50} (years)	G/S_u	c_h (m^2/s)	c_h (m^2/year)	M (MPa)	k_h (m/s)
13-7-1 Rev 1	7.02	58.5	3417	1.08E-004	74.00	1.98E-007	6	0.36	5.37E-009
13-7-1 Rev 1	14.07	28.9	834	2.64E-005	57.00	7.11E-007	22	1.45	4.80E-009
13-7-1 Rev 1	20.97	24.4	596	1.89E-005	52.00	9.50E-007	30	3.07	3.03E-009

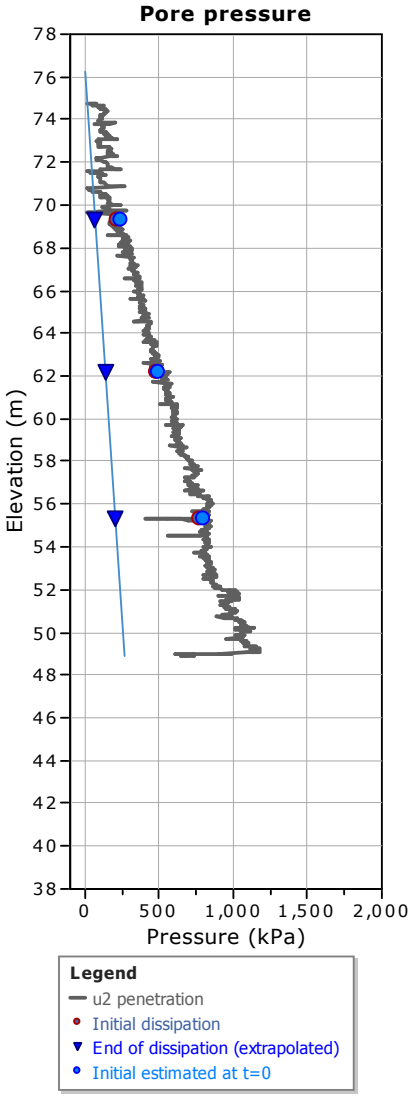

Piezocone Dissipation Test: 13-7-1 Rev 1
Depth: 7.02 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 68.87 (kPa)
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 13-7-1 Rev 1
Depth: 14.07 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 138.03 (kPa)
28.875
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0


Piezocone Dissipation Test: 13-7-1 Rev 1
Depth: 20.97 (m)
assumed initial pore pressure, ui
u initial dissipation
u0 = 205.72 (kPa)
24.415
Porepressure u2 (kPa)
t^0.50 (s^0.50)


Pore pressure
Elevation (m)
Pressure (kPa)
Legend
u2 penetration
Initial dissipation
End of dissipation (extrapolated)
Initial estimated at t=0