



PROTEZIONE CIVILE
 Presidenza del Consiglio dei Ministri
 Dipartimento della Protezione Civile



**CONFERENZA DELLE REGIONI E
 DELLE PROVINCE AUTONOME**

Attuazione dell'articolo 11 della legge 24 giugno 2009, n. 77

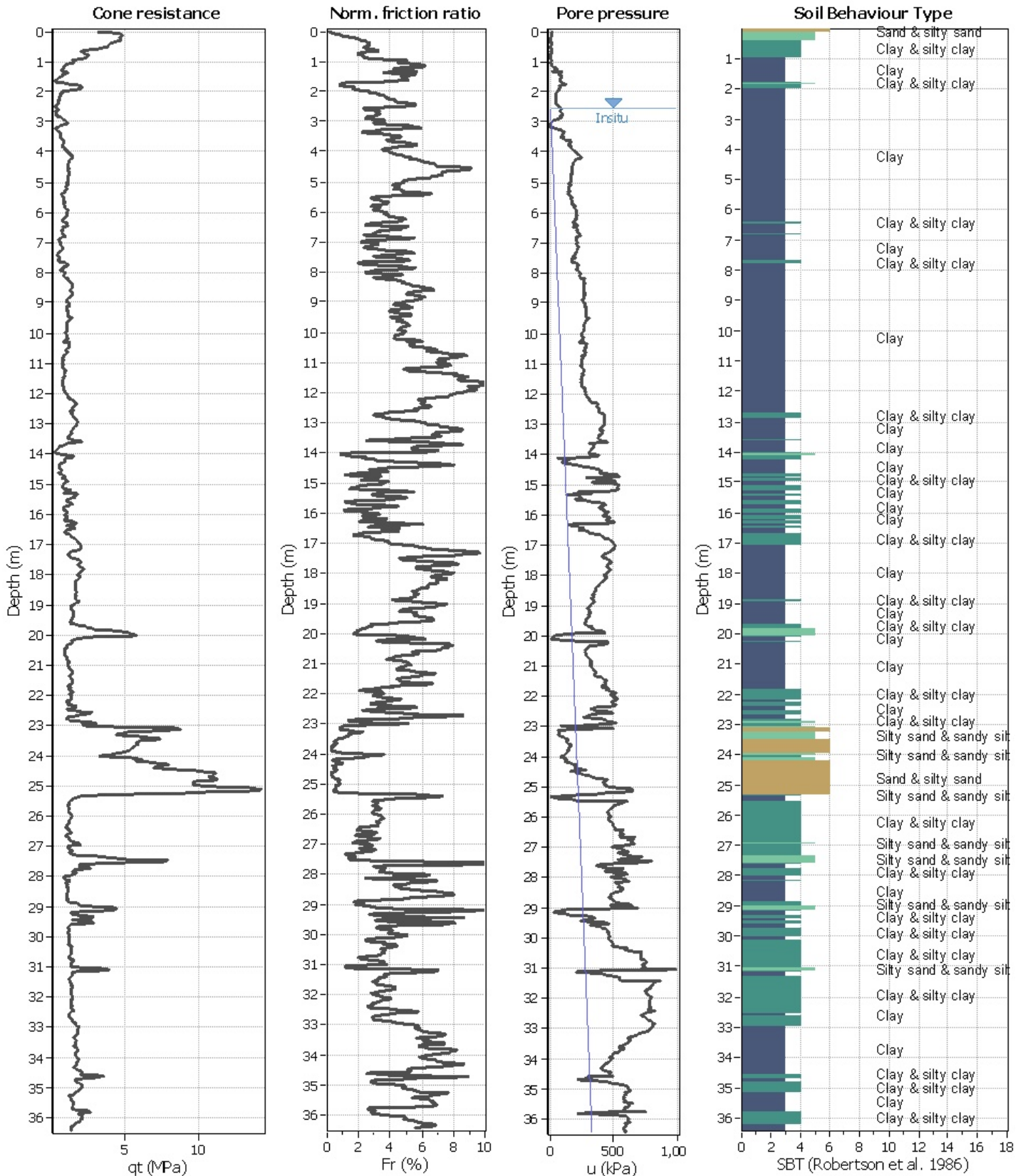
MICROZONAZIONE SISMICA

Verifiche del rischio di liquefazione

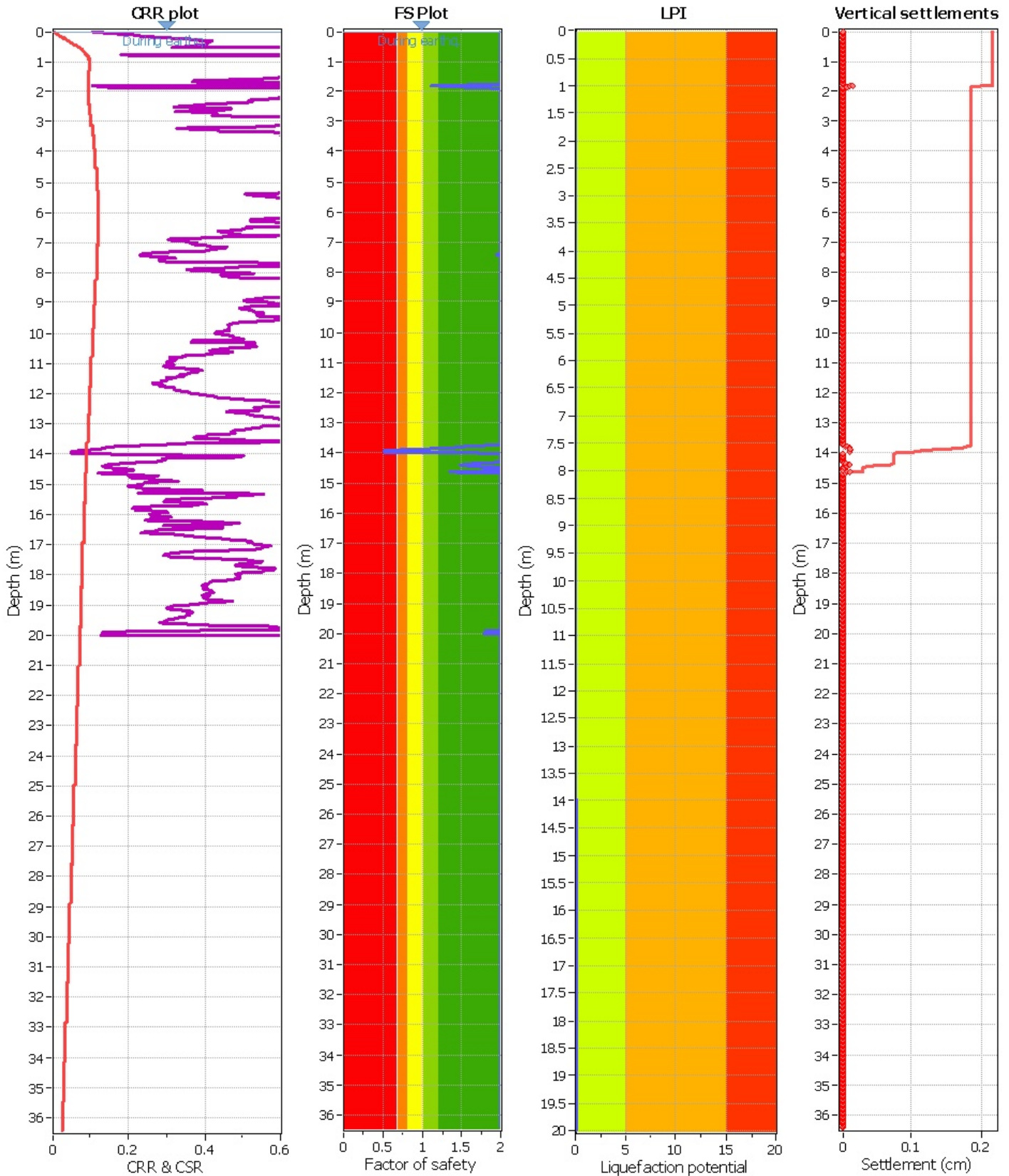
Regione Emilia – Romagna
 Comune di Sorbolo



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| <p>Regione Emilia Romagna</p> | <p>Soggetto realizzatore</p>  <p>EN GEO S.r.l. ENGINEERING GEOLOGY www.engeo.it</p> <p>Direttori tecnici: Dott. Geol. Carlo Caleffi Dott. Geol. Francesco Cerutti</p> <p>Collaboratori: Dott. Geol. Matteo Baisi Dott. Geol. Alessandro Ferrari</p> | <p>Data Dicembre 2016</p> |
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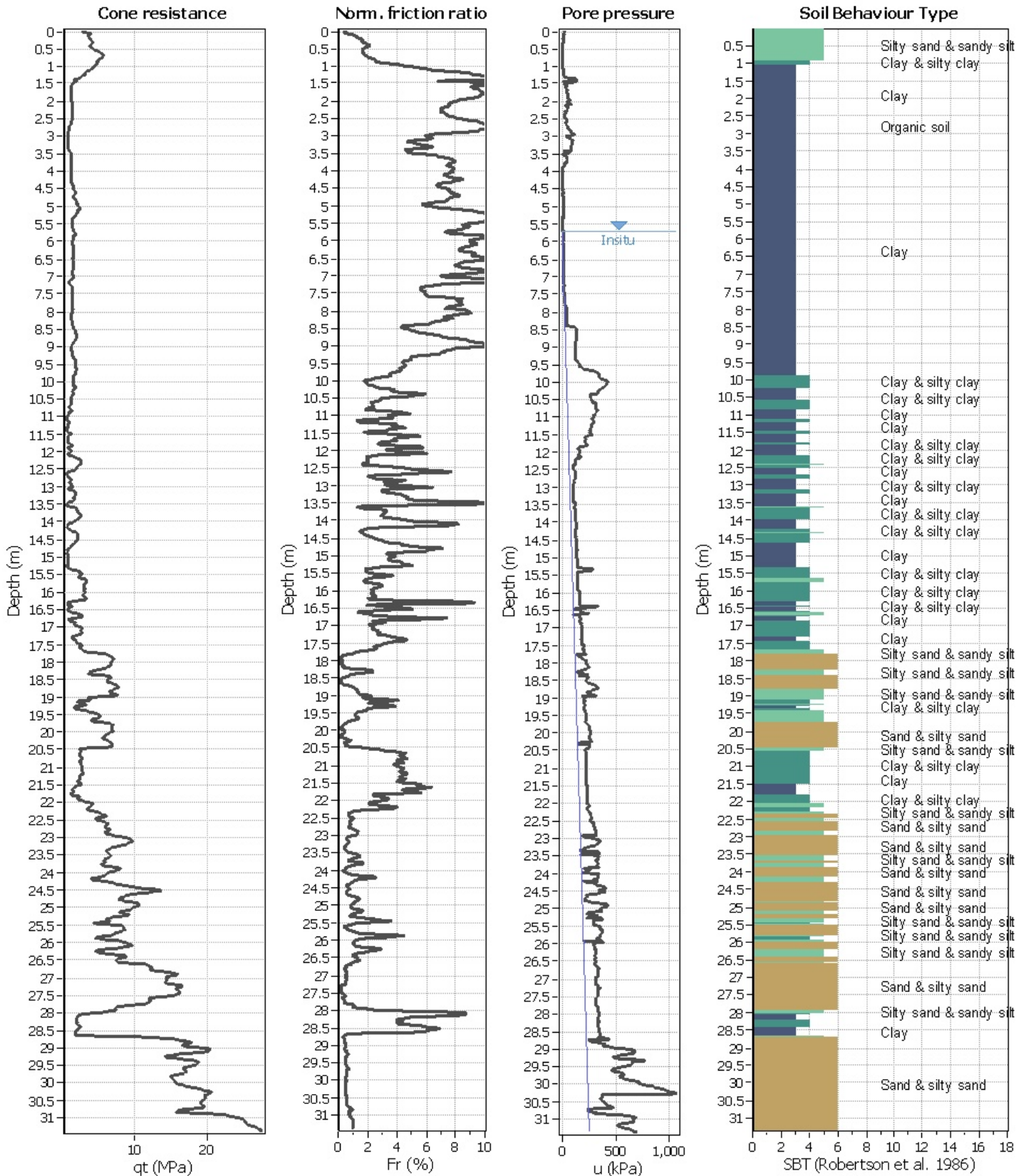
| | | | | | | | |
|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.55 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT | K_0 applied: | No | MSF method: | Method based |



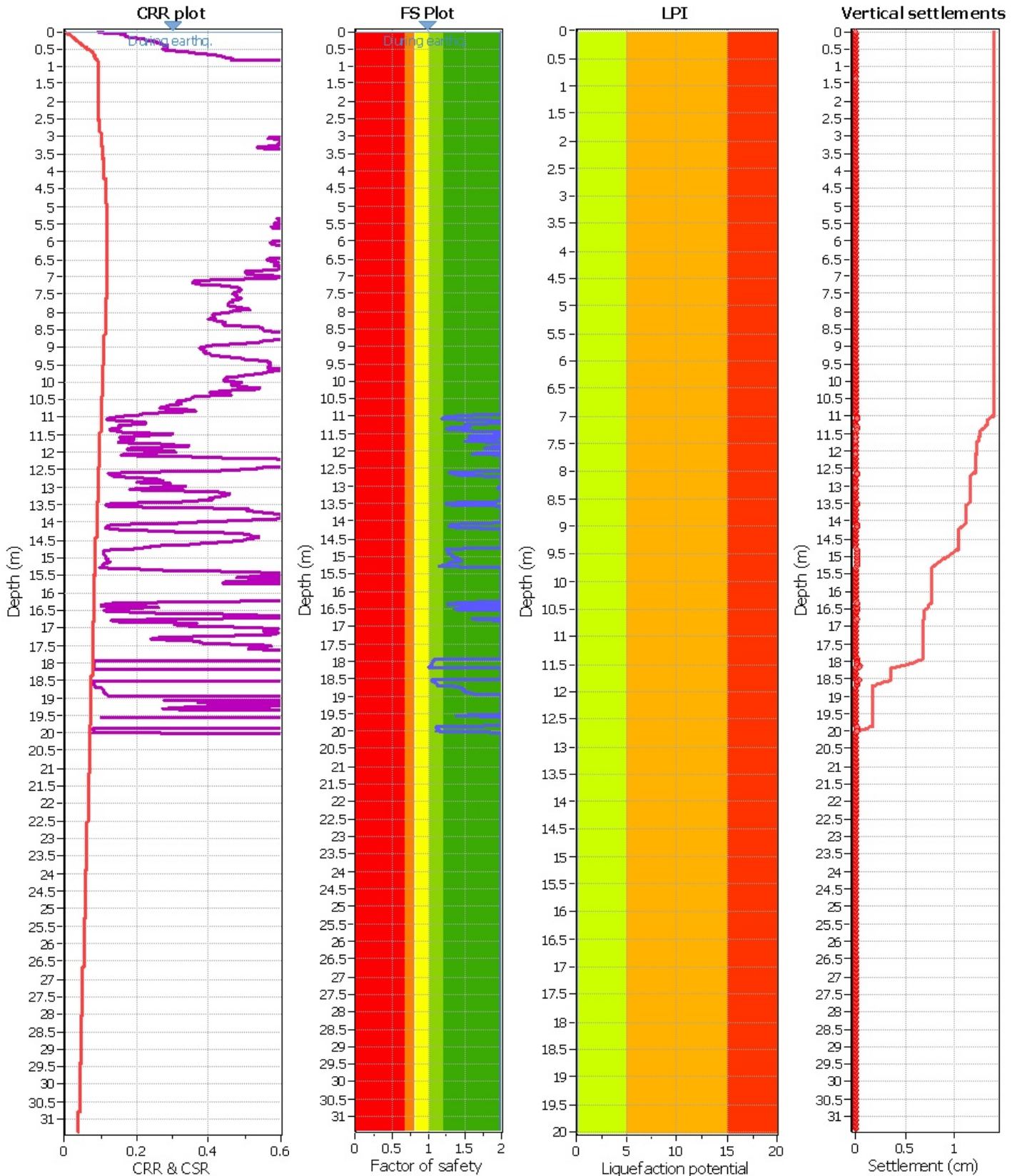
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| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.55 m |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m |
| Points to test: | Based on Ic value | Average results interval: | 3 |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT |

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|-------------------------|-----|
| Use fill: | No |
| Fill height: | N/A |
| Fill weight: | N/A |
| Trans. detect. applied: | Yes |
| K_0 applied: | No |

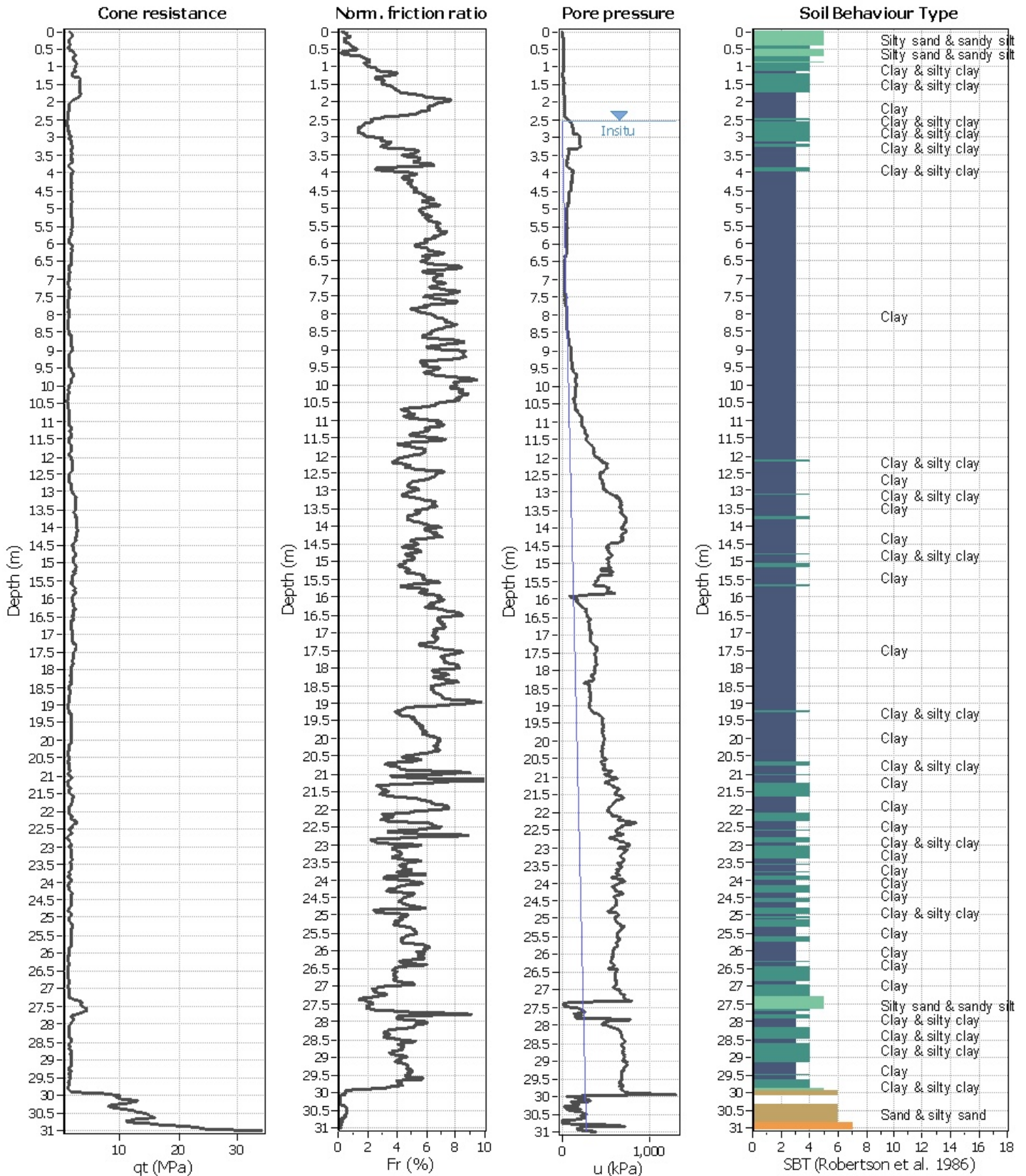
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|-----------------------------|--------------|
| Clay like behavior applied: | All soils |
| Limit depth applied: | Yes |
| Limit depth: | 20.00 m |
| MSF method: | Method based |



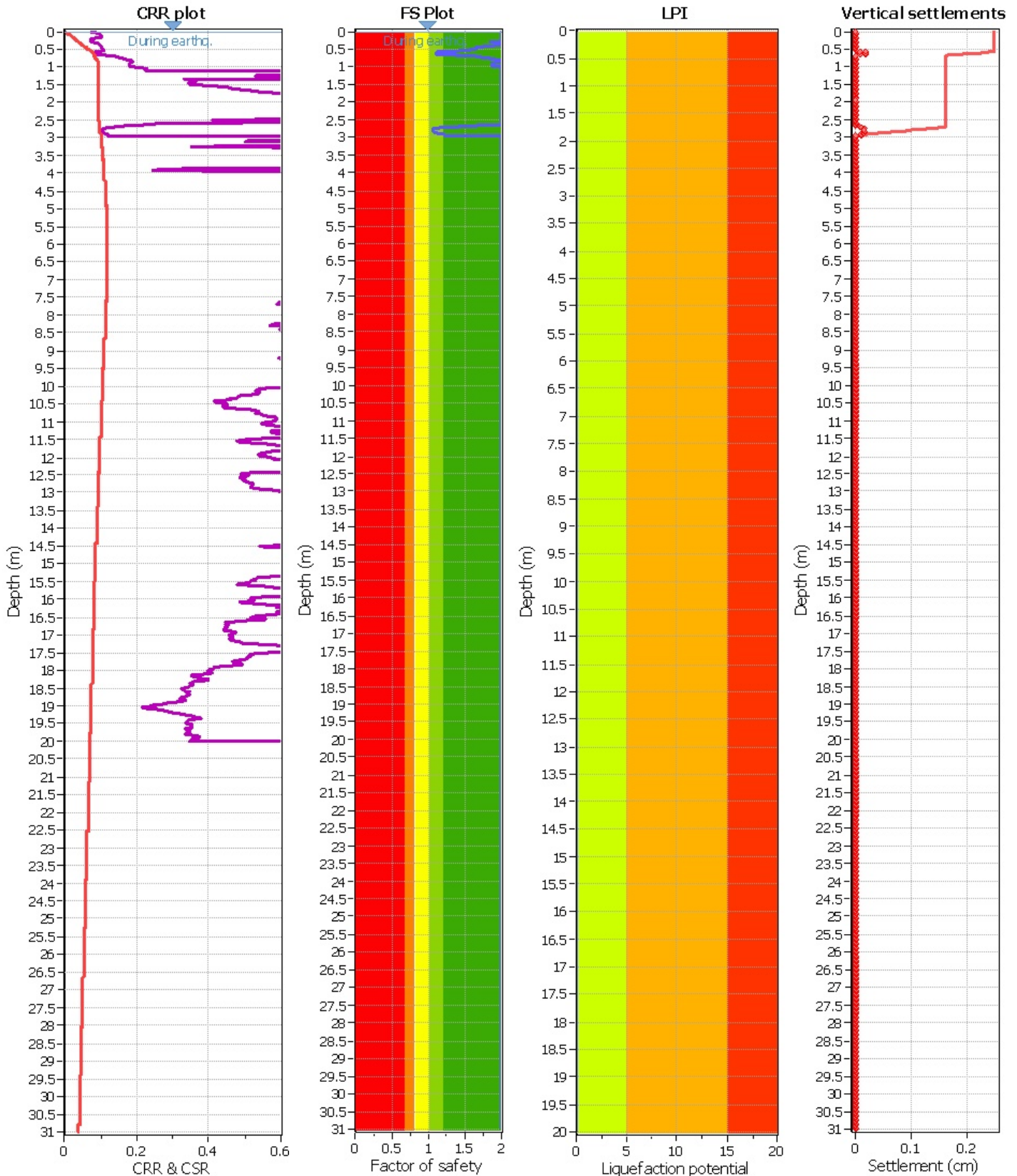
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|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 5.70 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
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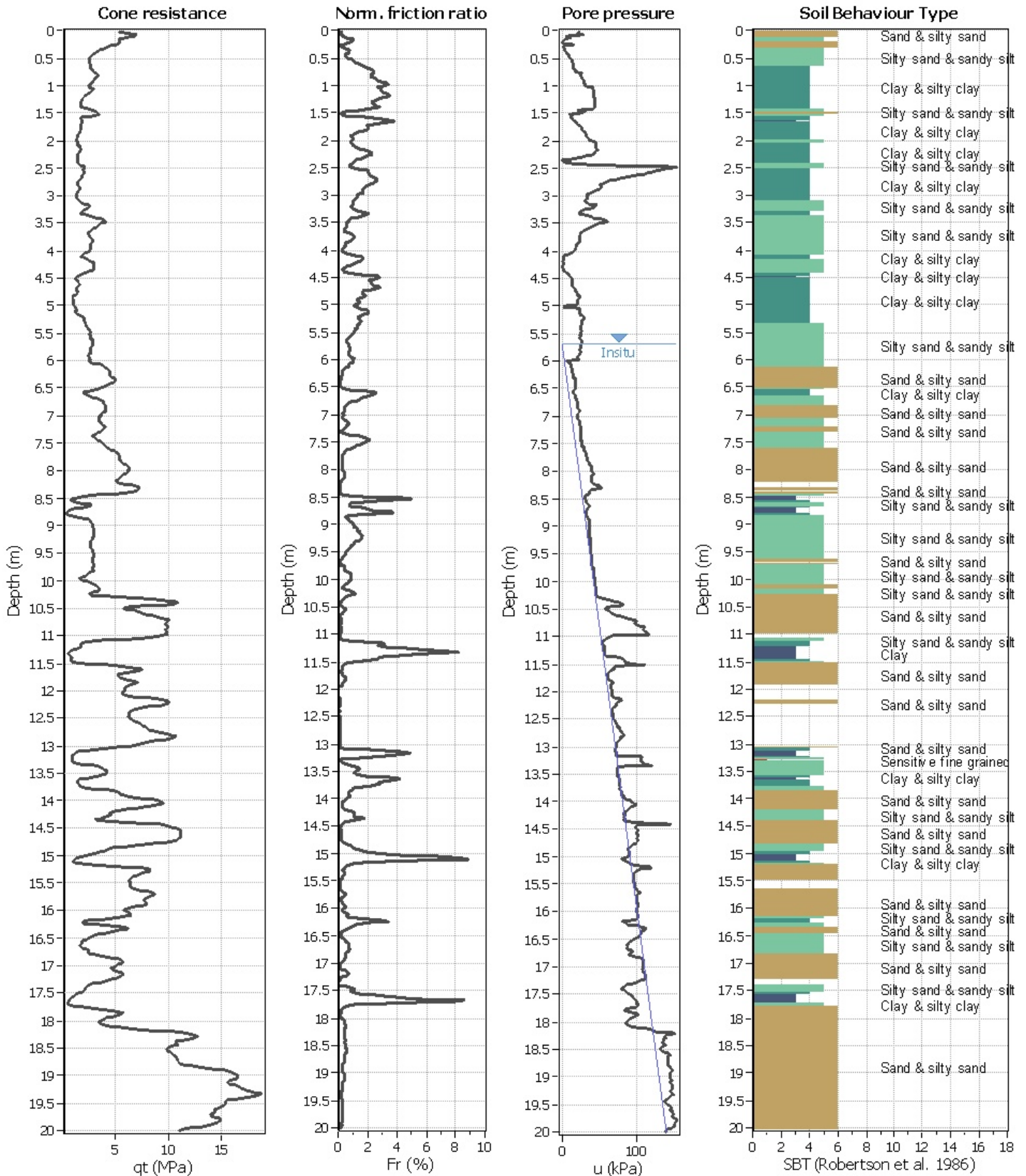
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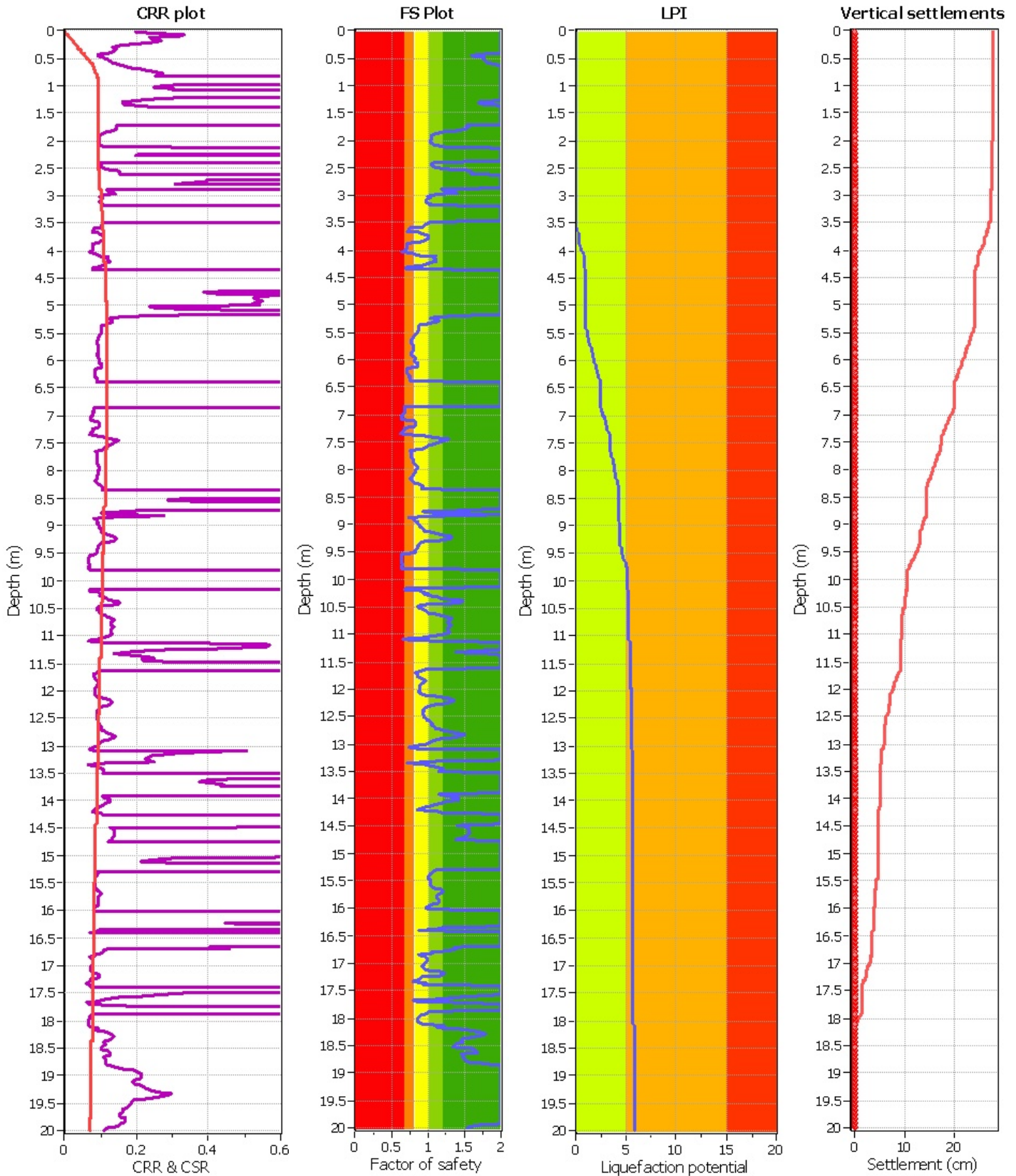
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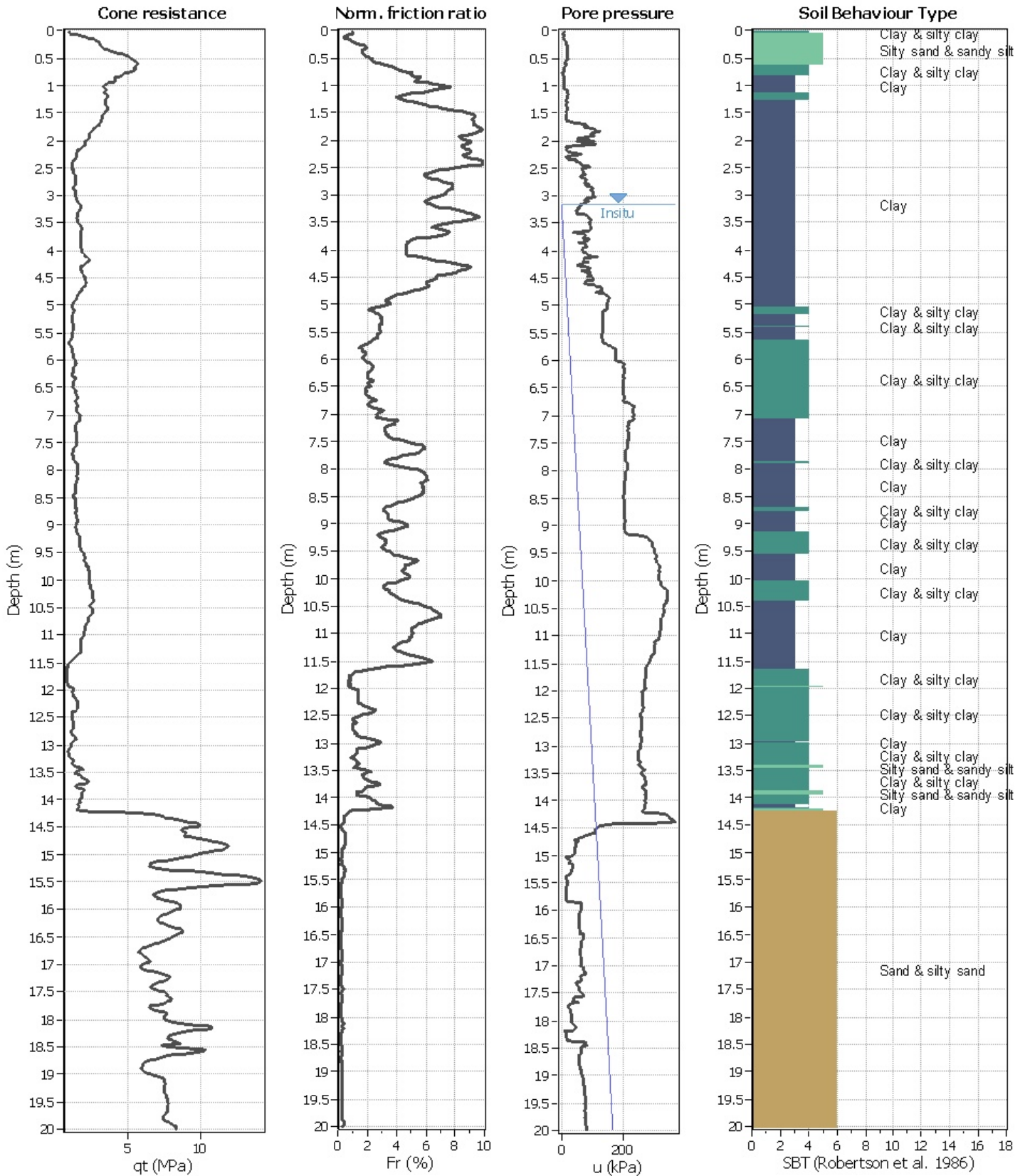
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|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 5.70 m | Use fill: | No | Clay like behavior | |
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| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT | K_0 applied: | No | MSF method: | Method based |



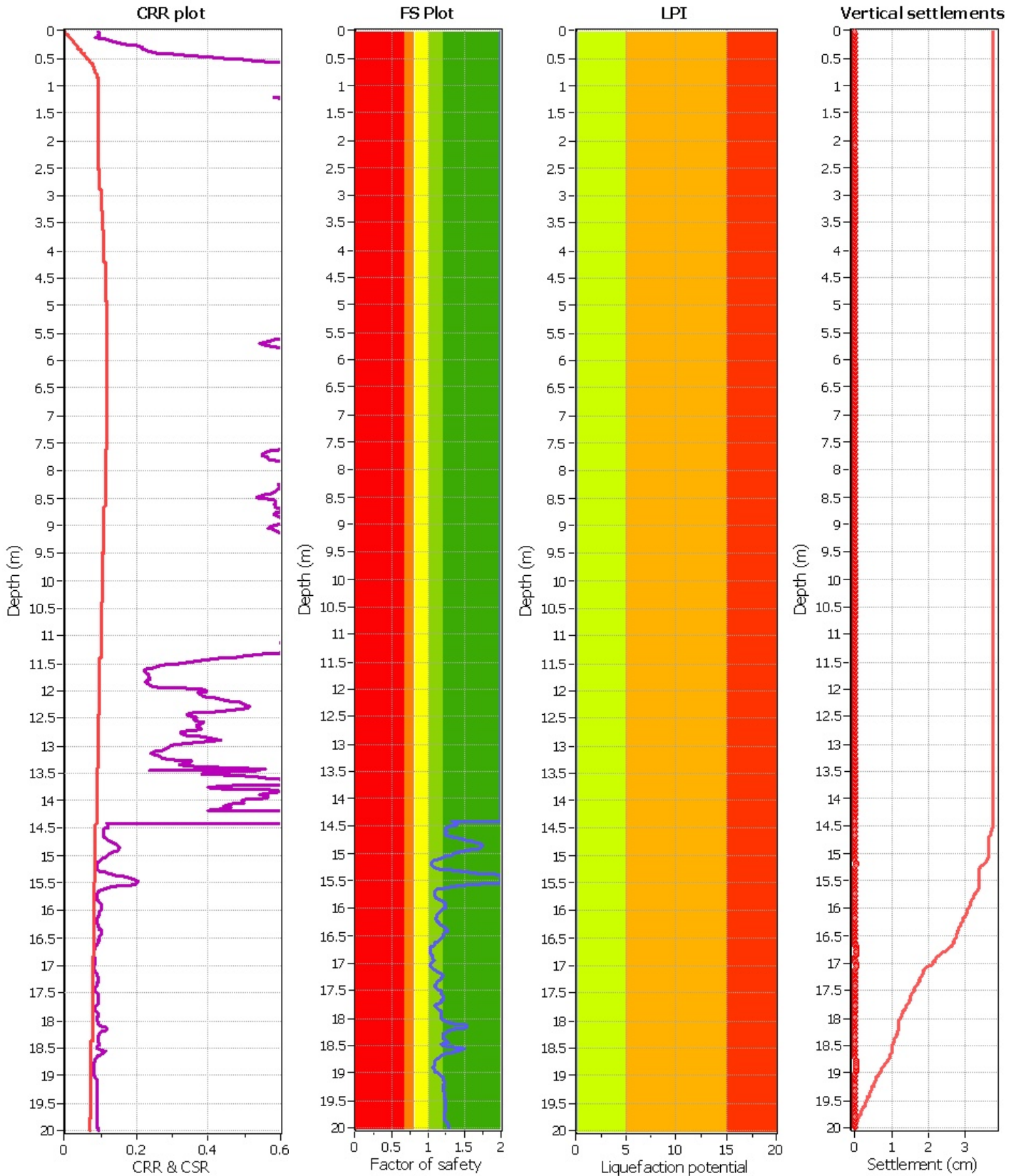
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|------------------------------|-------------------|---------------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 5.70 m |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m |
| Points to test: | Based on Ic value | Average results interval: | 3 |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT |

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|-------------------------|-----|
| Use fill: | No |
| Fill height: | N/A |
| Fill weight: | N/A |
| Trans. detect. applied: | Yes |
| K_0 applied: | No |

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|-----------------------------|--------------|
| Clay like behavior applied: | All soils |
| Limit depth applied: | Yes |
| Limit depth: | 20.00 m |
| MSF method: | Method based |



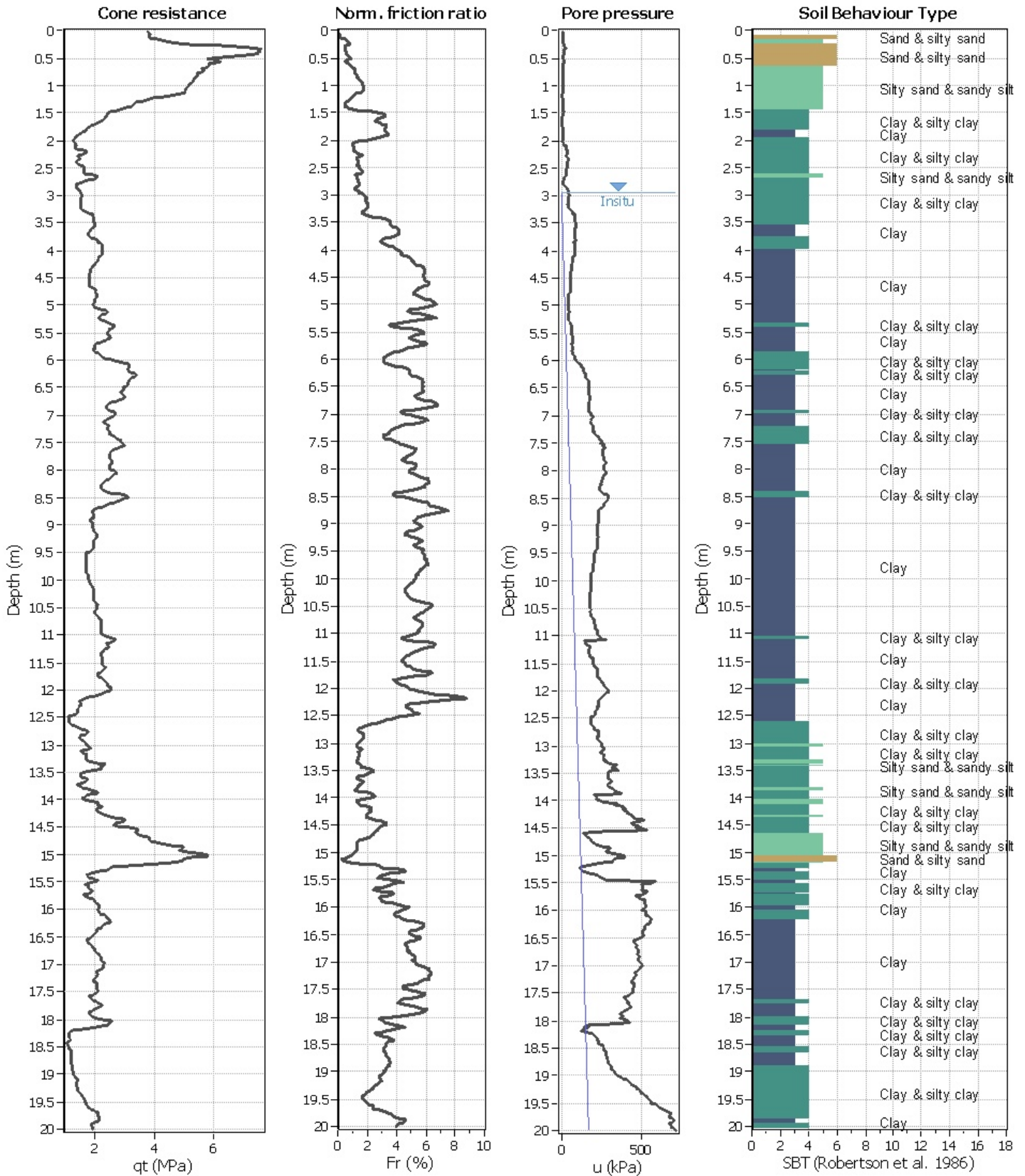
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|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 3.15 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT | K_0 applied: | No | MSF method: | Method based |



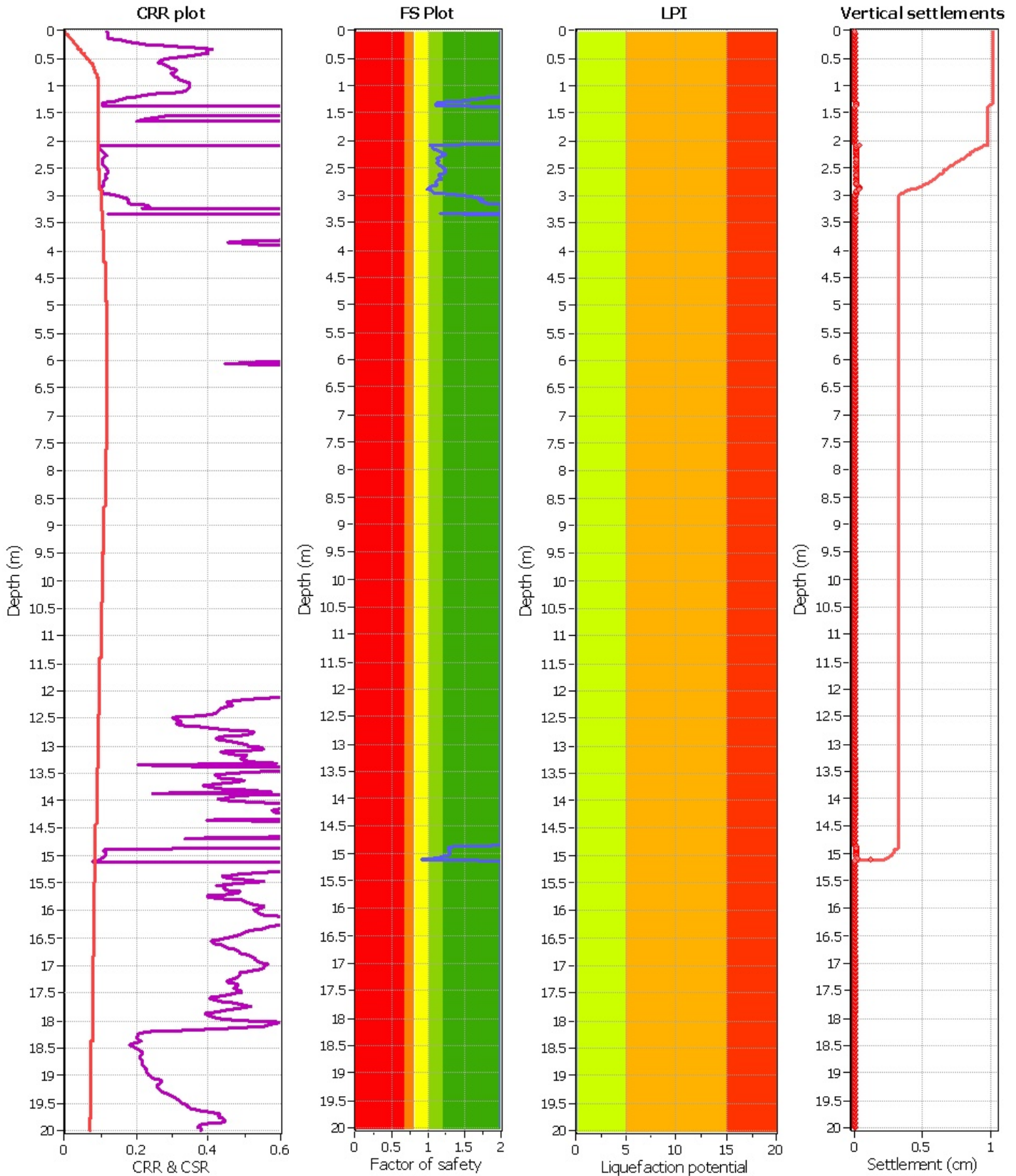
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|------------------------------|-------------------|---------------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 3.15 m |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m |
| Points to test: | Based on Ic value | Average results interval: | 3 |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT |

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|-------------------------|-----|
| Use fill: | No |
| Fill height: | N/A |
| Fill weight: | N/A |
| Trans. detect. applied: | Yes |
| K_0 applied: | No |

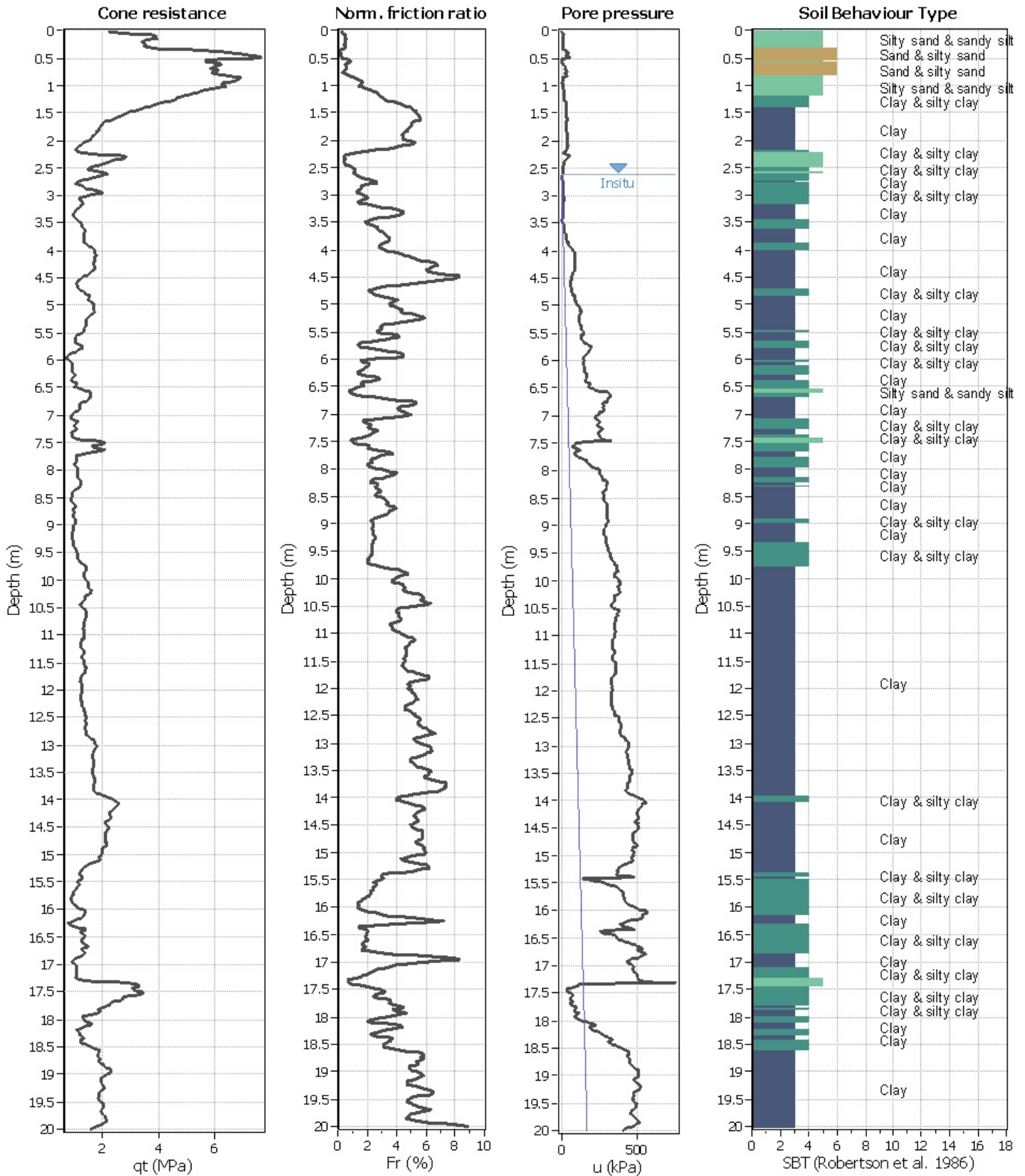
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|-----------------------------|--------------|
| Clay like behavior applied: | All soils |
| Limit depth applied: | Yes |
| Limit depth: | 20.00 m |
| MSF method: | Method based |



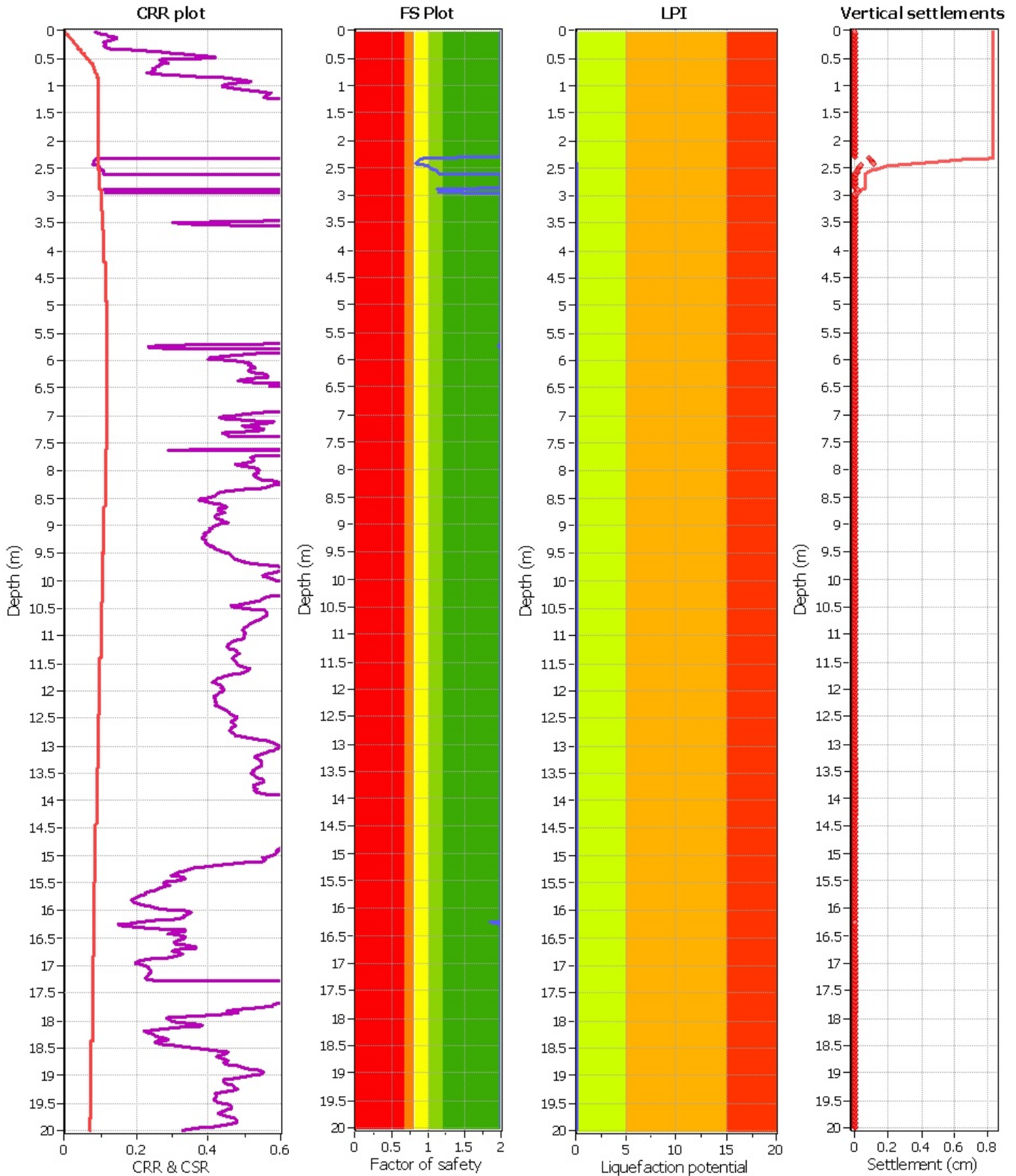
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|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.95 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT | K_0 applied: | No | MSF method: | Method based |



| | | | | | | | |
|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.95 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT | K_0 applied: | No | MSF method: | Method based |



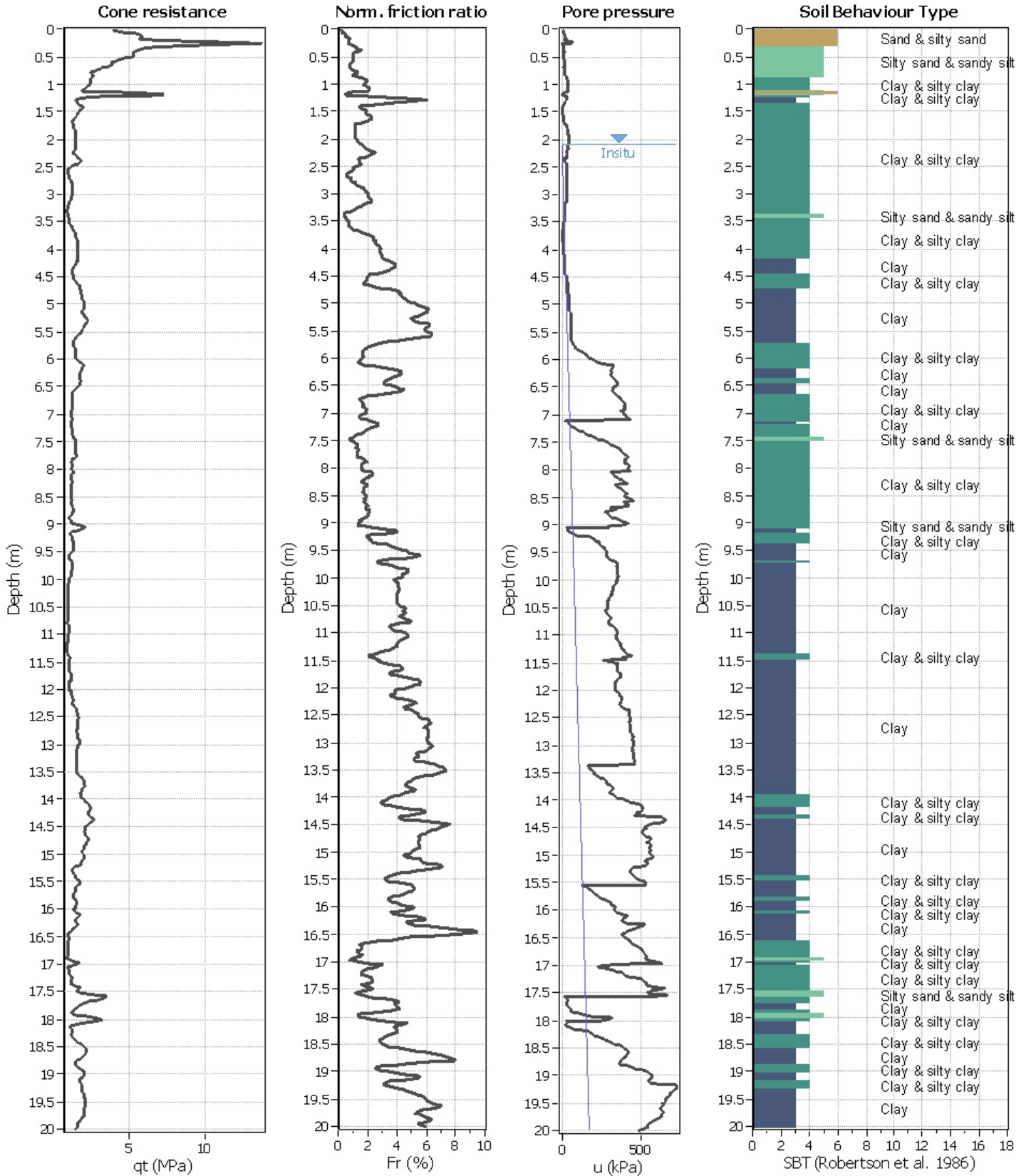
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| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.60 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
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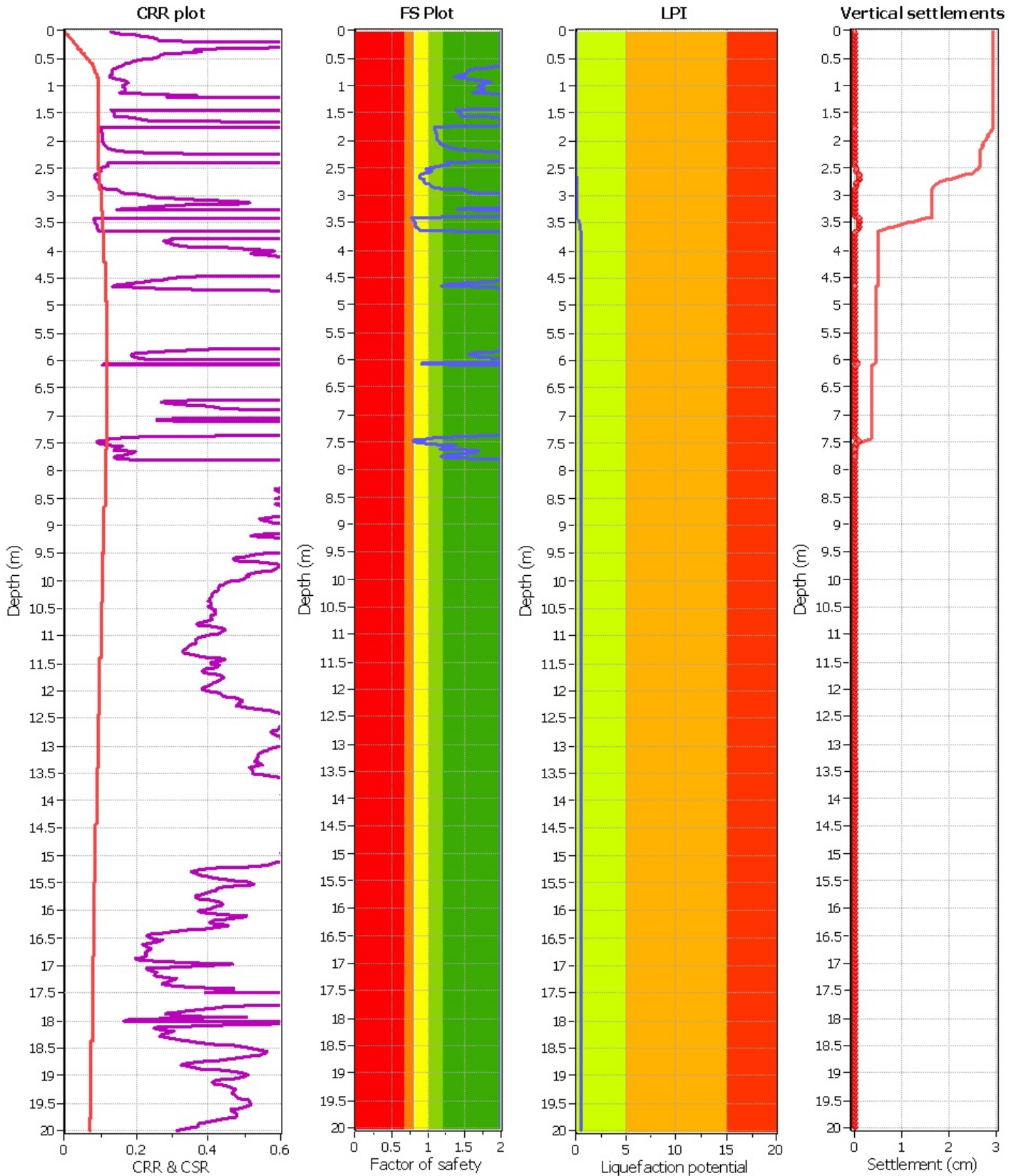
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| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m |
| Points to test: | Based on Ic value | Average results interval: | 3 |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT |

| | |
|-------------------------|-----|
| Use fill: | No |
| Fill height: | N/A |
| Fill weight: | N/A |
| Trans. detect. applied: | Yes |
| K_0 applied: | No |

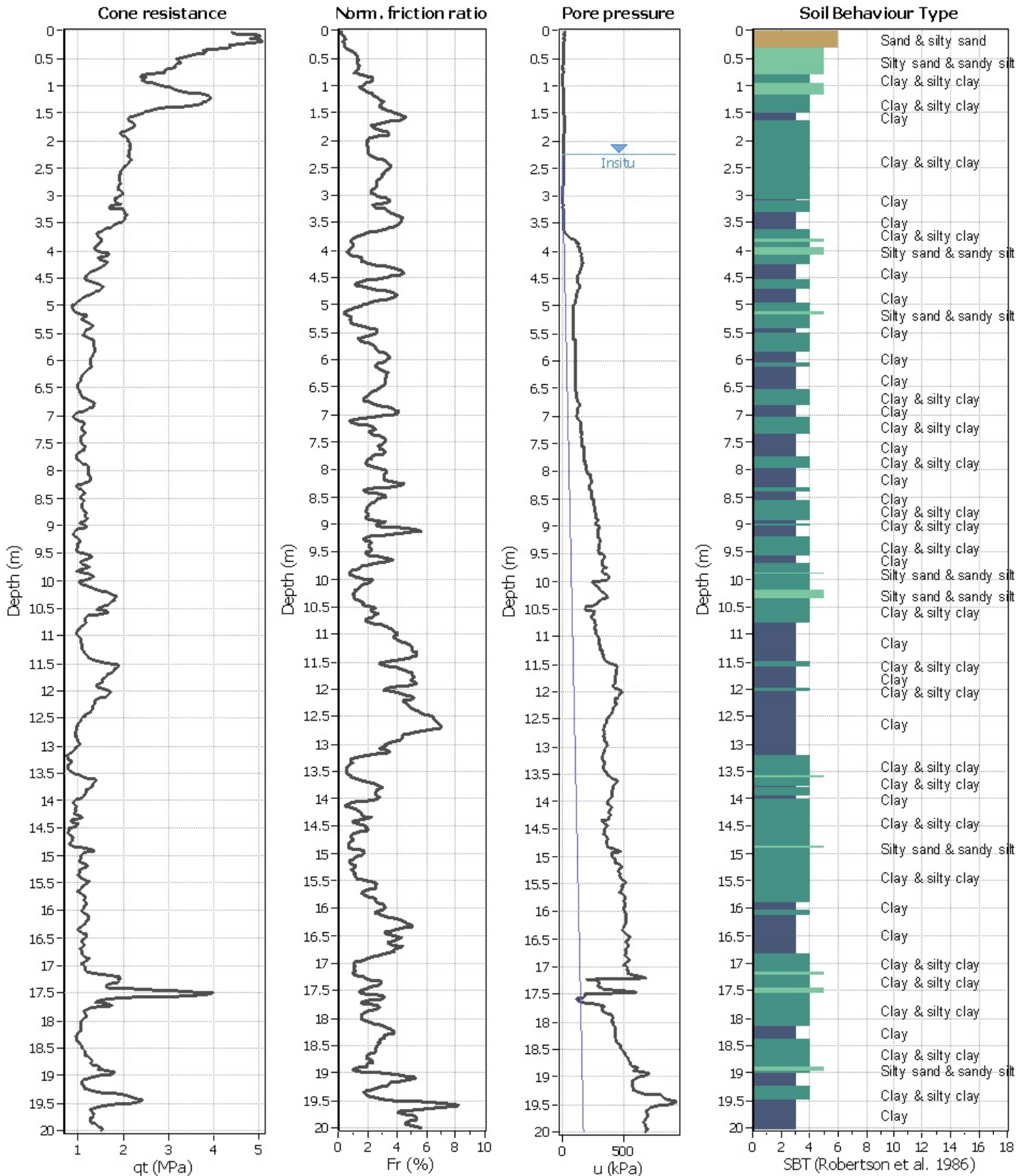
| | |
|-----------------------------|--------------|
| Clay like behavior applied: | All soils |
| Limit depth applied: | Yes |
| Limit depth: | 20.00 m |
| MSF method: | Method based |



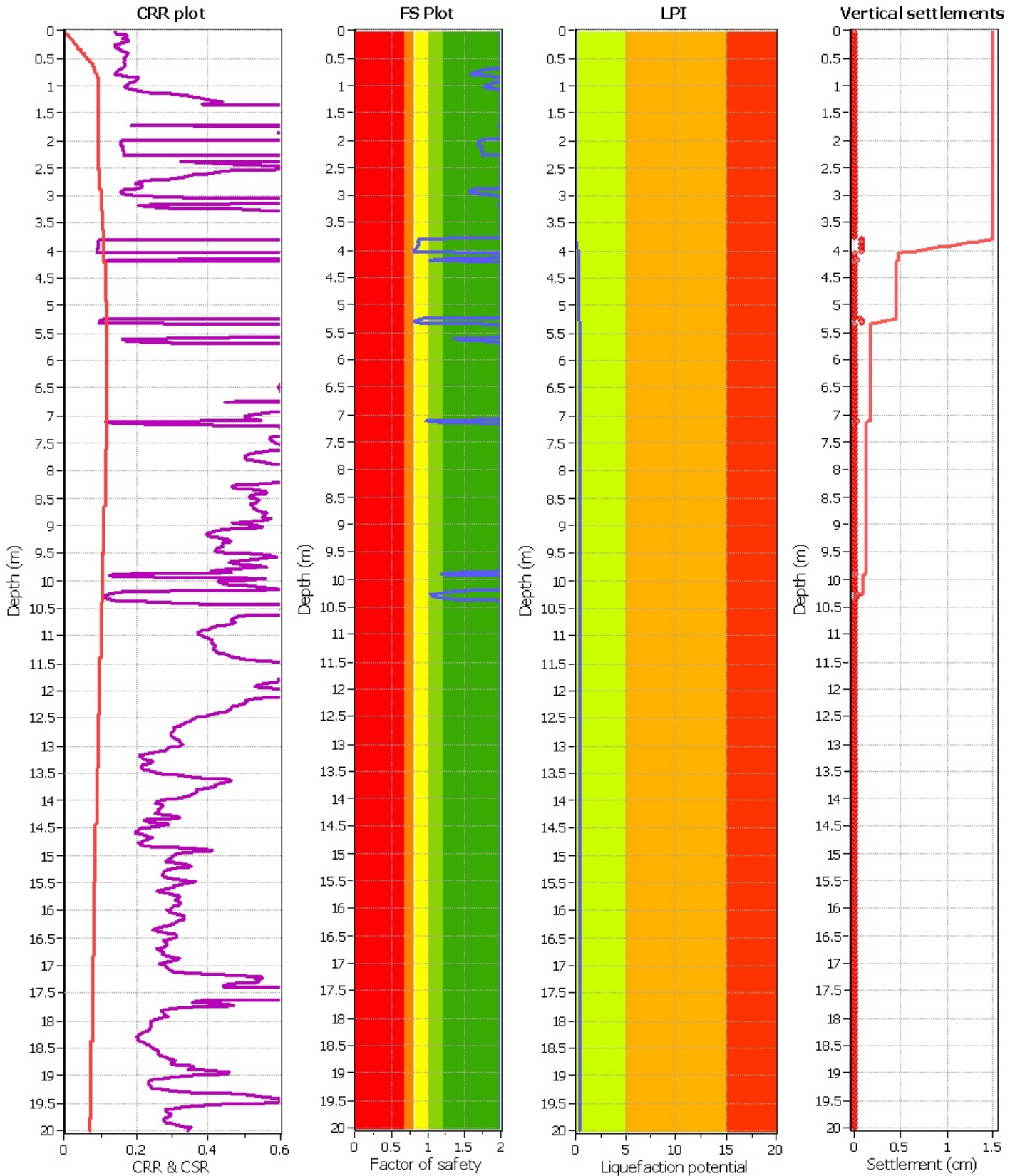
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|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.10 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
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| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
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|------------------------------|-------------------|---------------------------|--------------|-------------------------|-----|----------------------|--------------|
| Analysis method: | Robertson (2009) | G.W.T. (in-situ): | 2.25 m | Use fill: | No | Clay like behavior | |
| Fines correction method: | Robertson (2009) | G.W.T. (earthq.): | 0.00 m | Fill height: | N/A | applied: | All soils |
| Points to test: | Based on Ic value | Average results interval: | 3 | Fill weight: | N/A | Limit depth applied: | Yes |
| Earthquake magnitude M_w : | 5.90 | Ic cut-off value: | 2.60 | Trans. detect. applied: | Yes | Limit depth: | 20.00 m |
| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT | K_0 applied: | No | MSF method: | Method based |



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| Points to test: | Based on Ic value | Average results interval: | 3 |
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| Peak ground acceleration: | 0.16 | Unit weight calculation: | Based on SBT |

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|-------------------------|-----|
| Use fill: | No |
| Fill height: | N/A |
| Fill weight: | N/A |
| Trans. detect. applied: | Yes |
| K_0 applied: | No |

| | |
|-----------------------------|--------------|
| Clay like behavior applied: | All soils |
| Limit depth applied: | Yes |
| Limit depth: | 20.00 m |
| MSF method: | Method based |