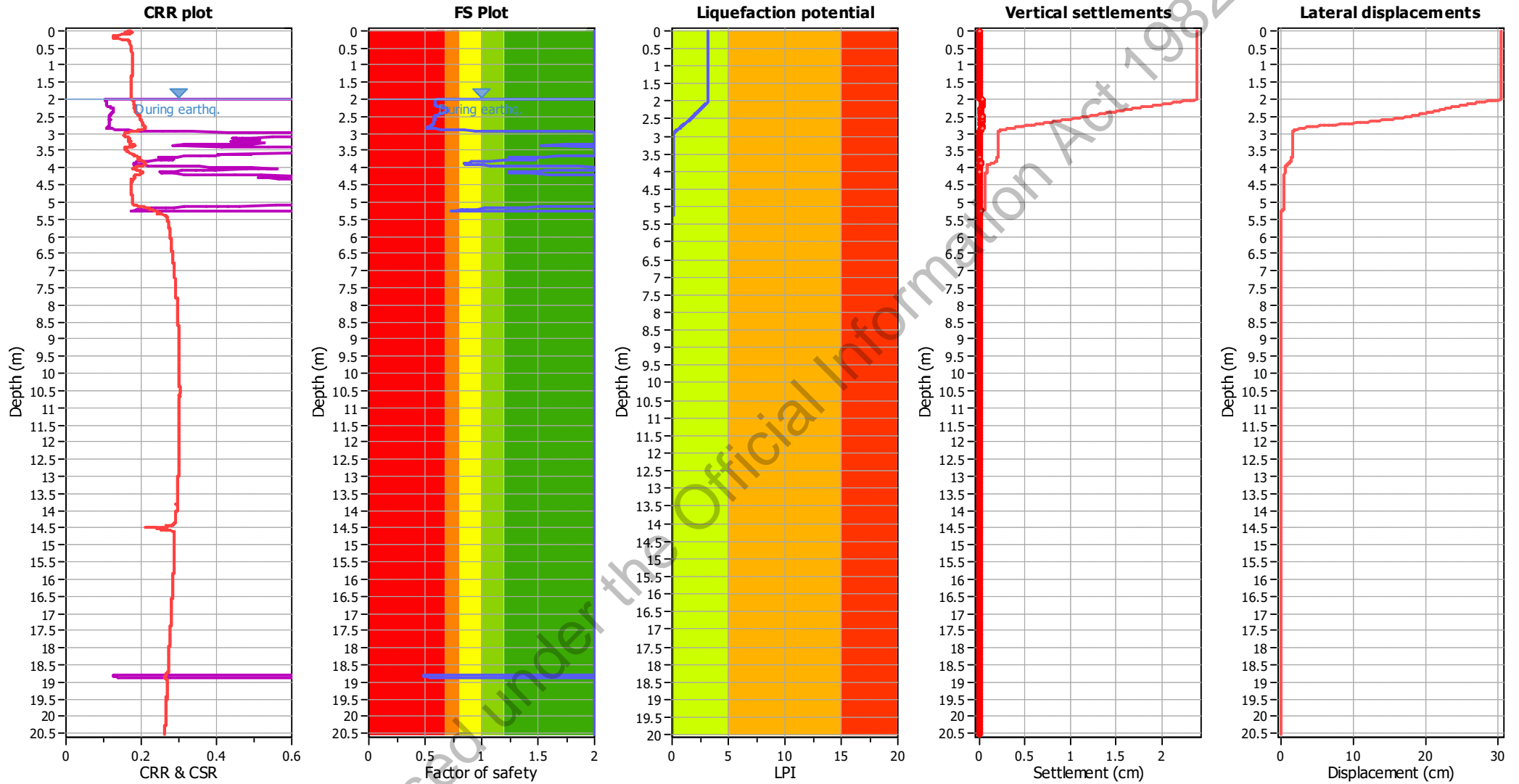


### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.32	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_q$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

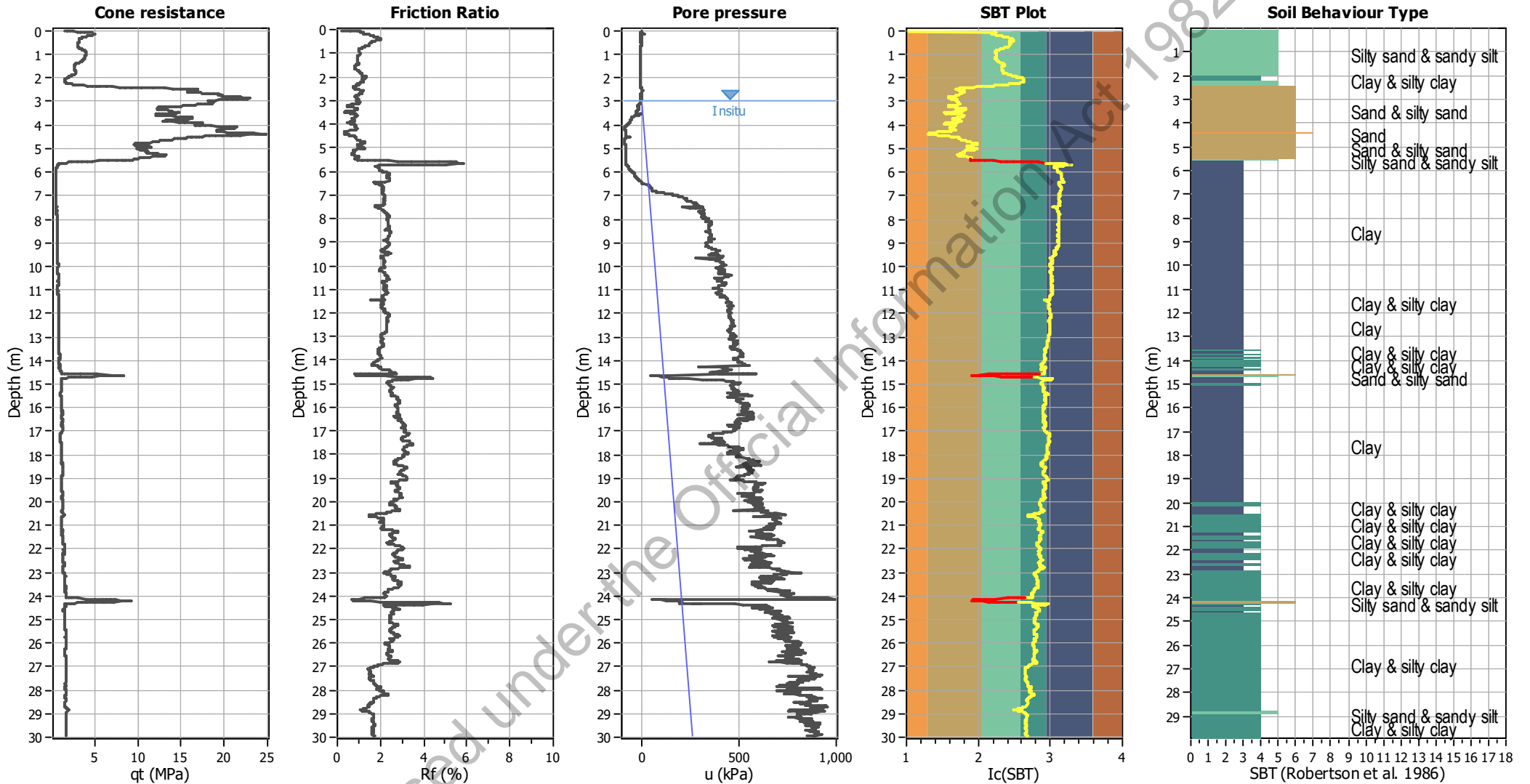
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



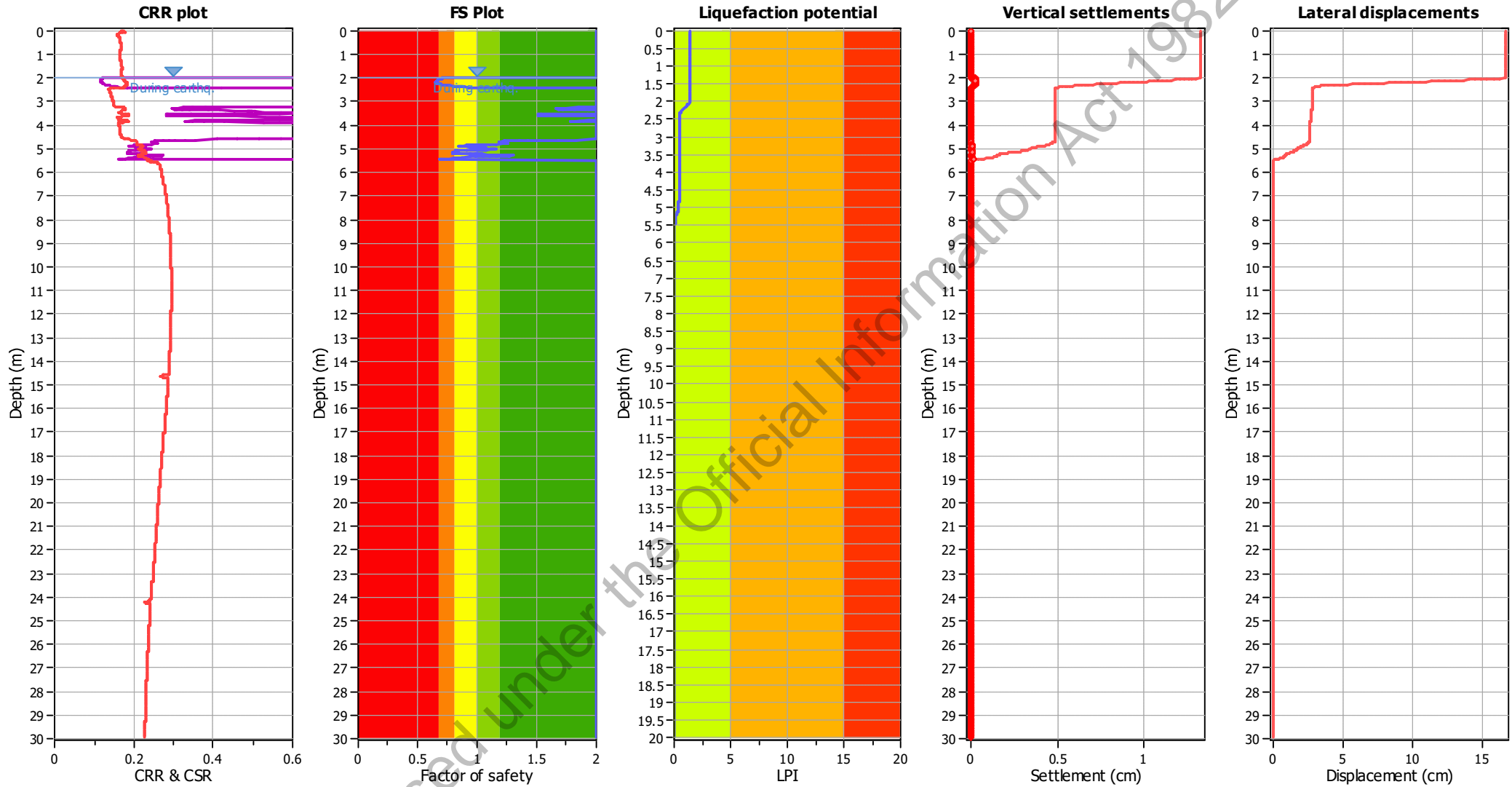
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>q</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.32	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.32	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_q$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

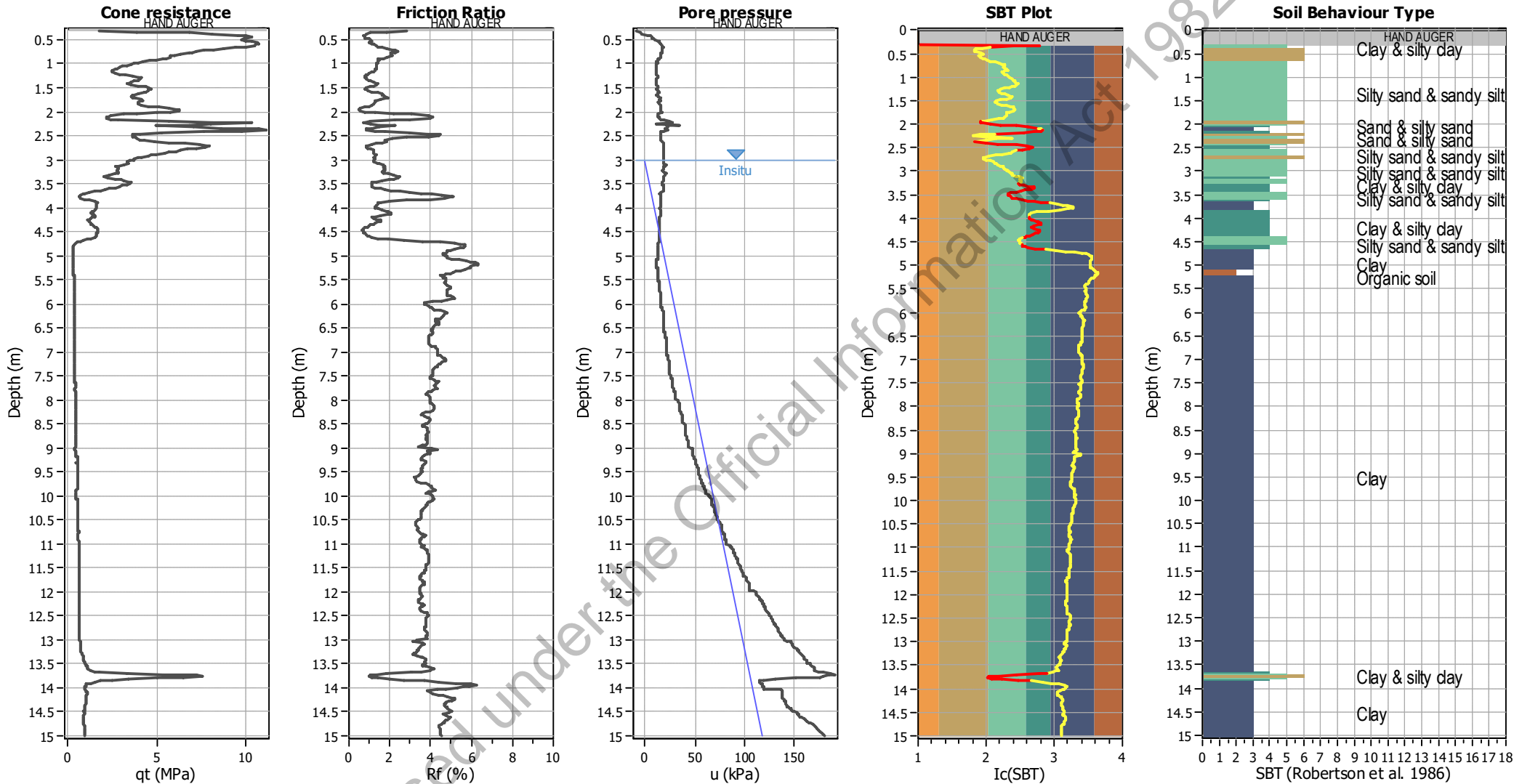
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



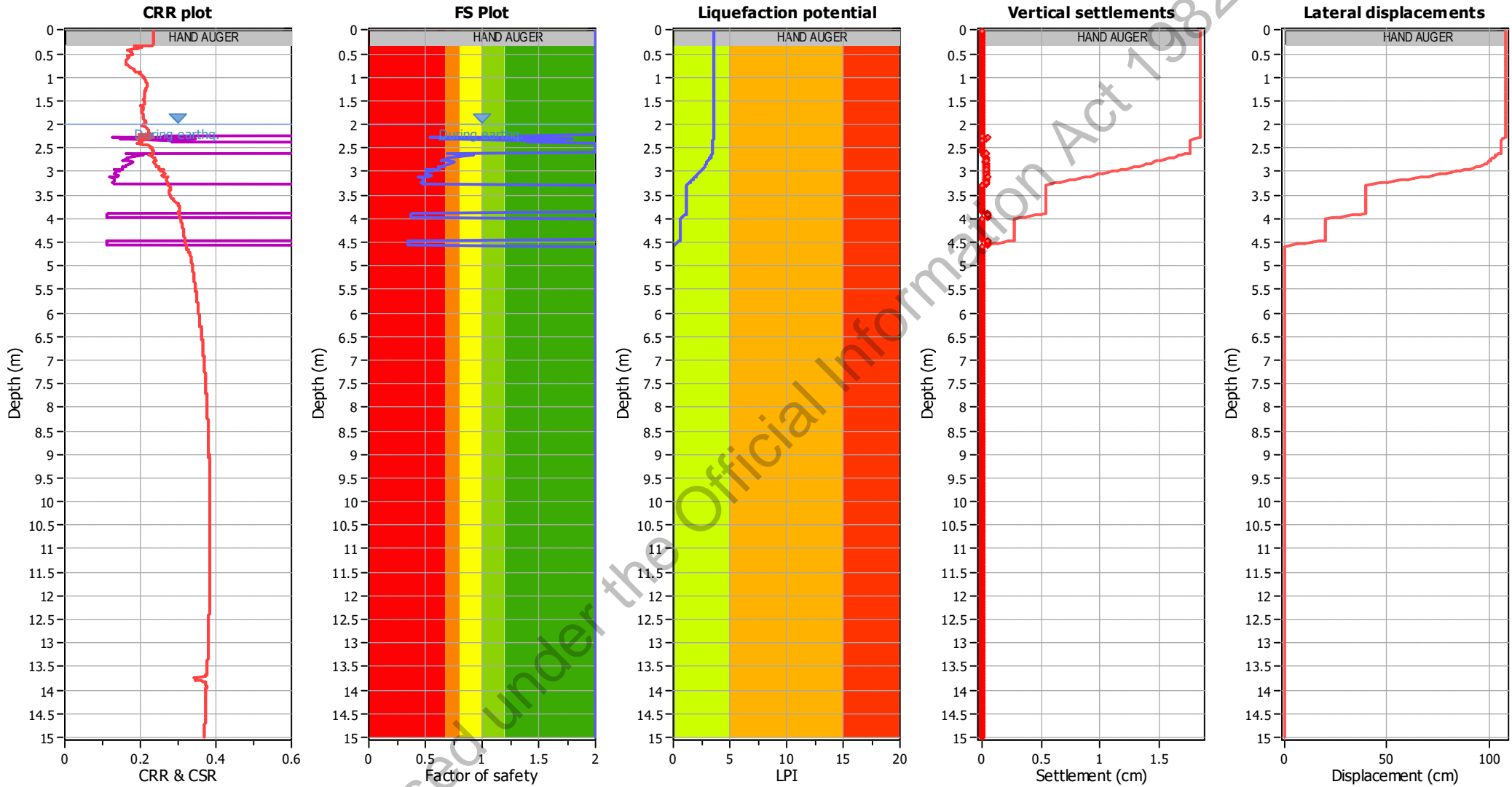
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_{\sigma}$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.41	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_0$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

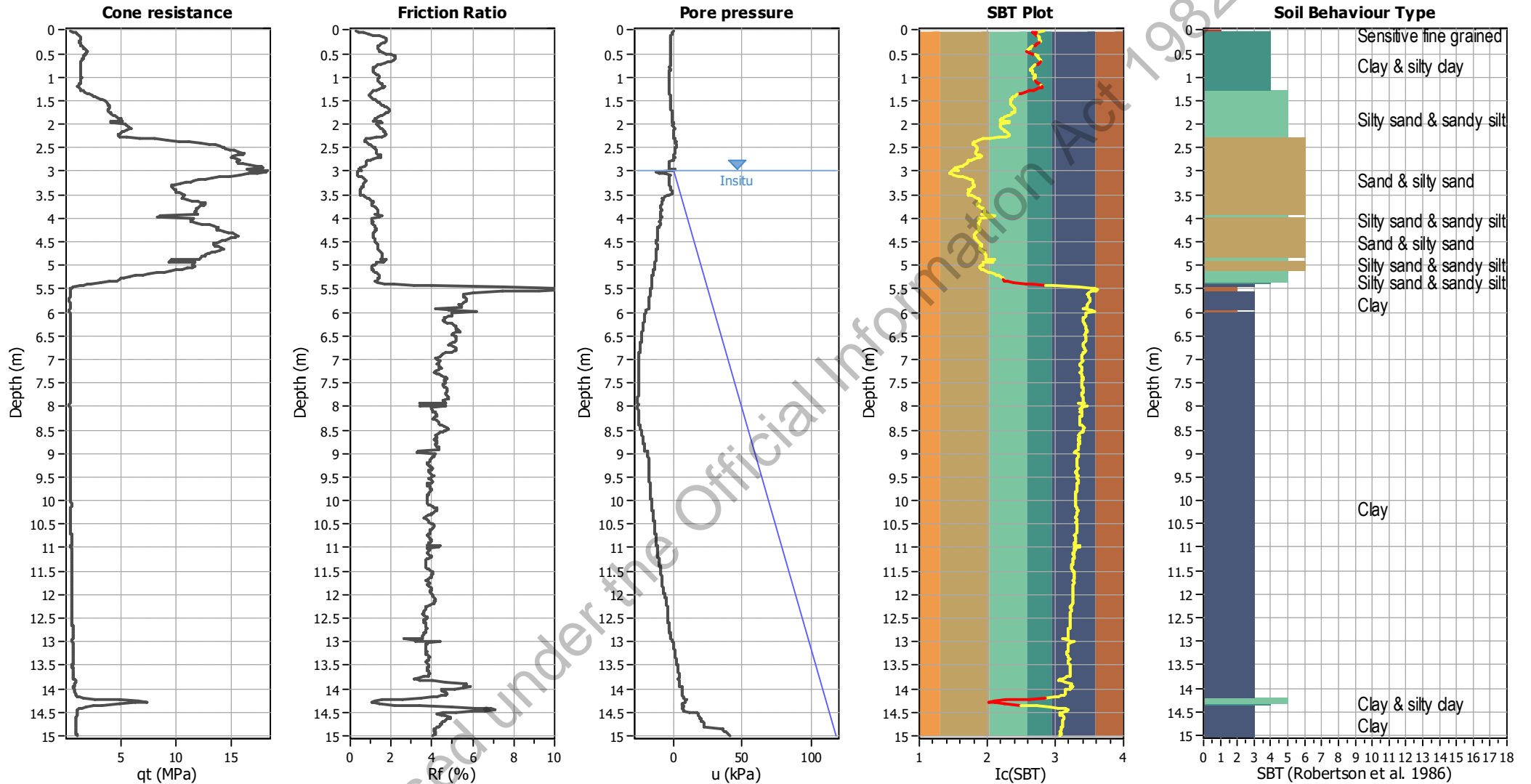
#### F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

#### LPI color scheme

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



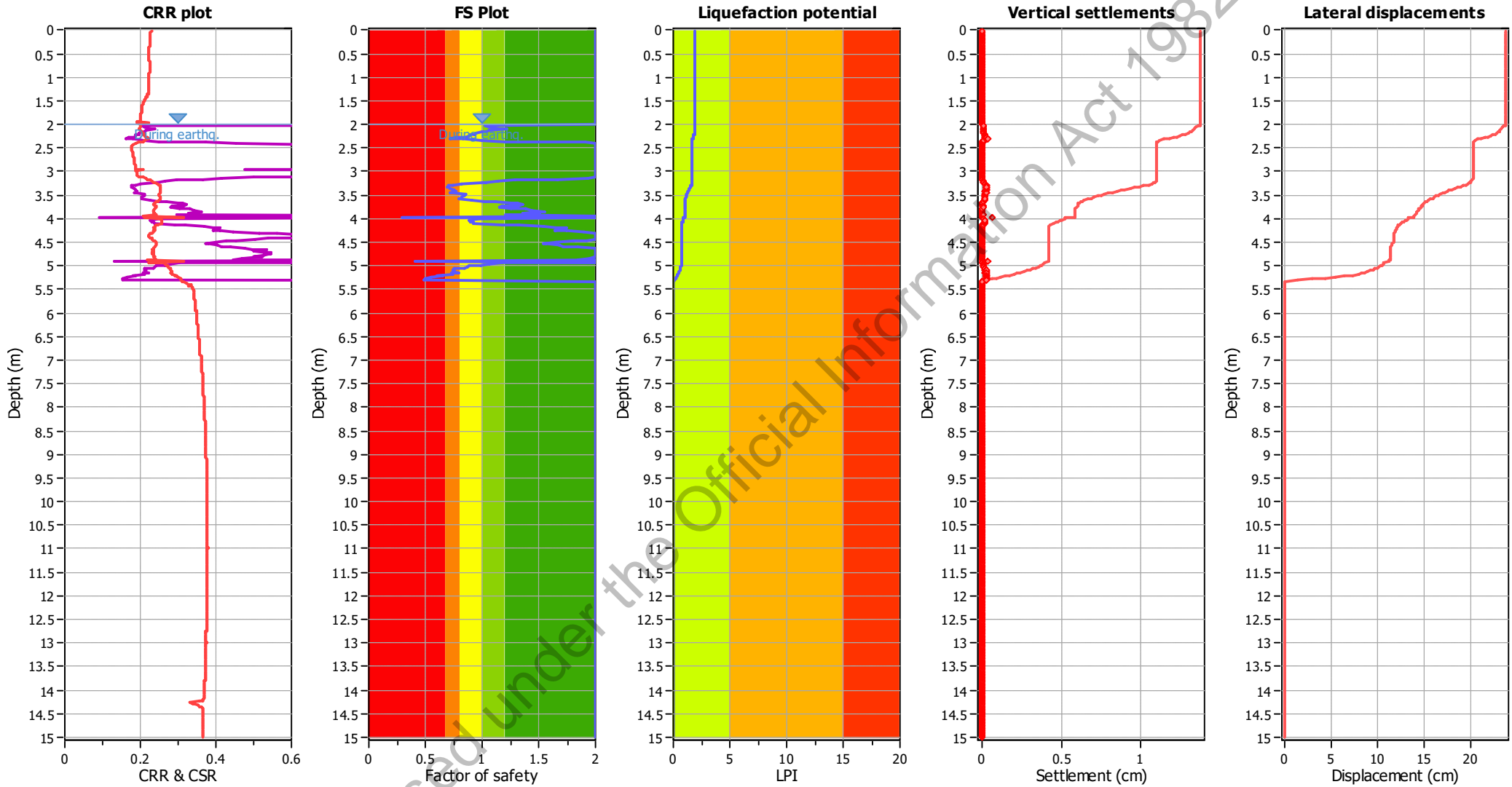
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>q</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.41	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_0$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

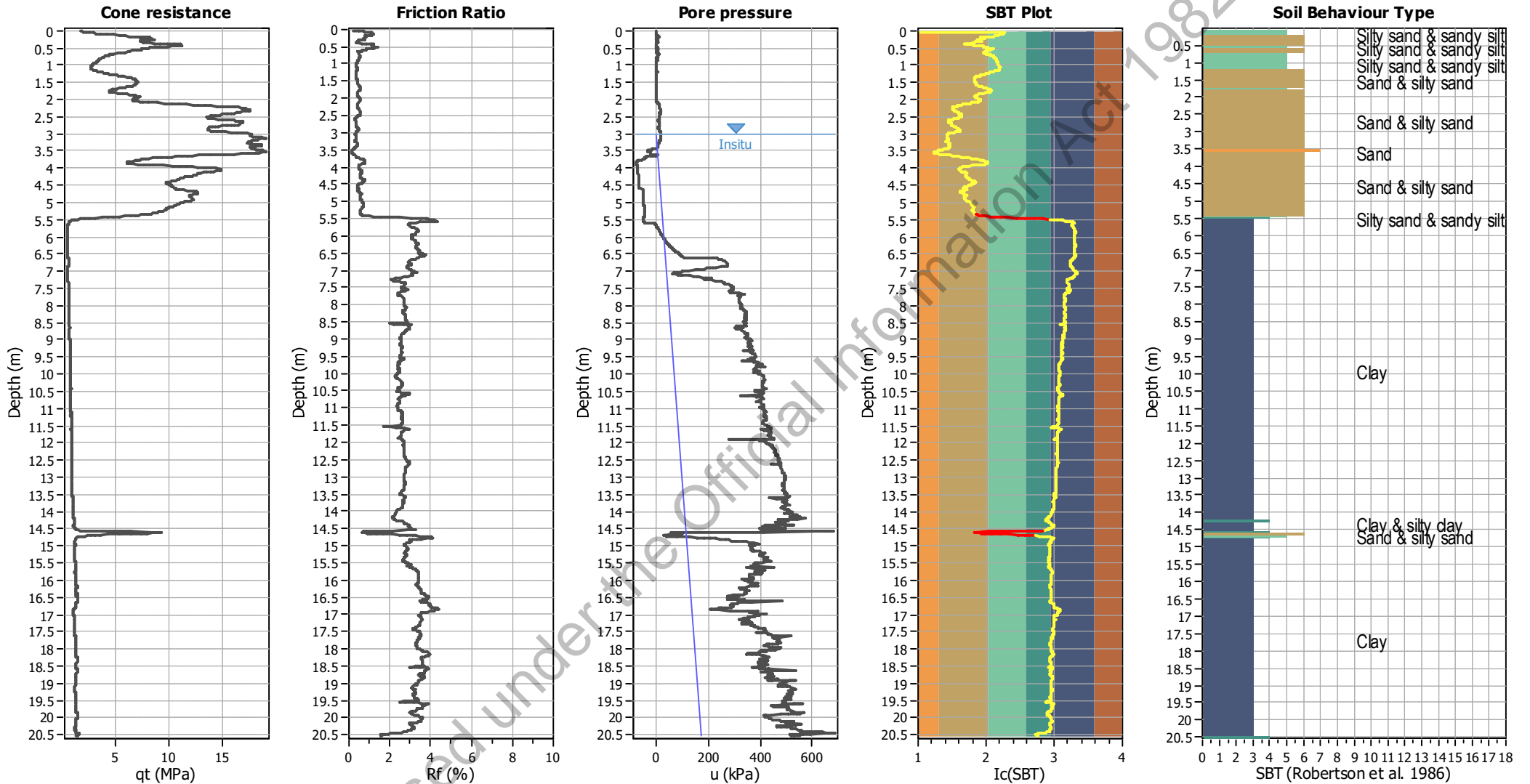
#### F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

#### LPI color scheme

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



#### Input parameters and analysis data

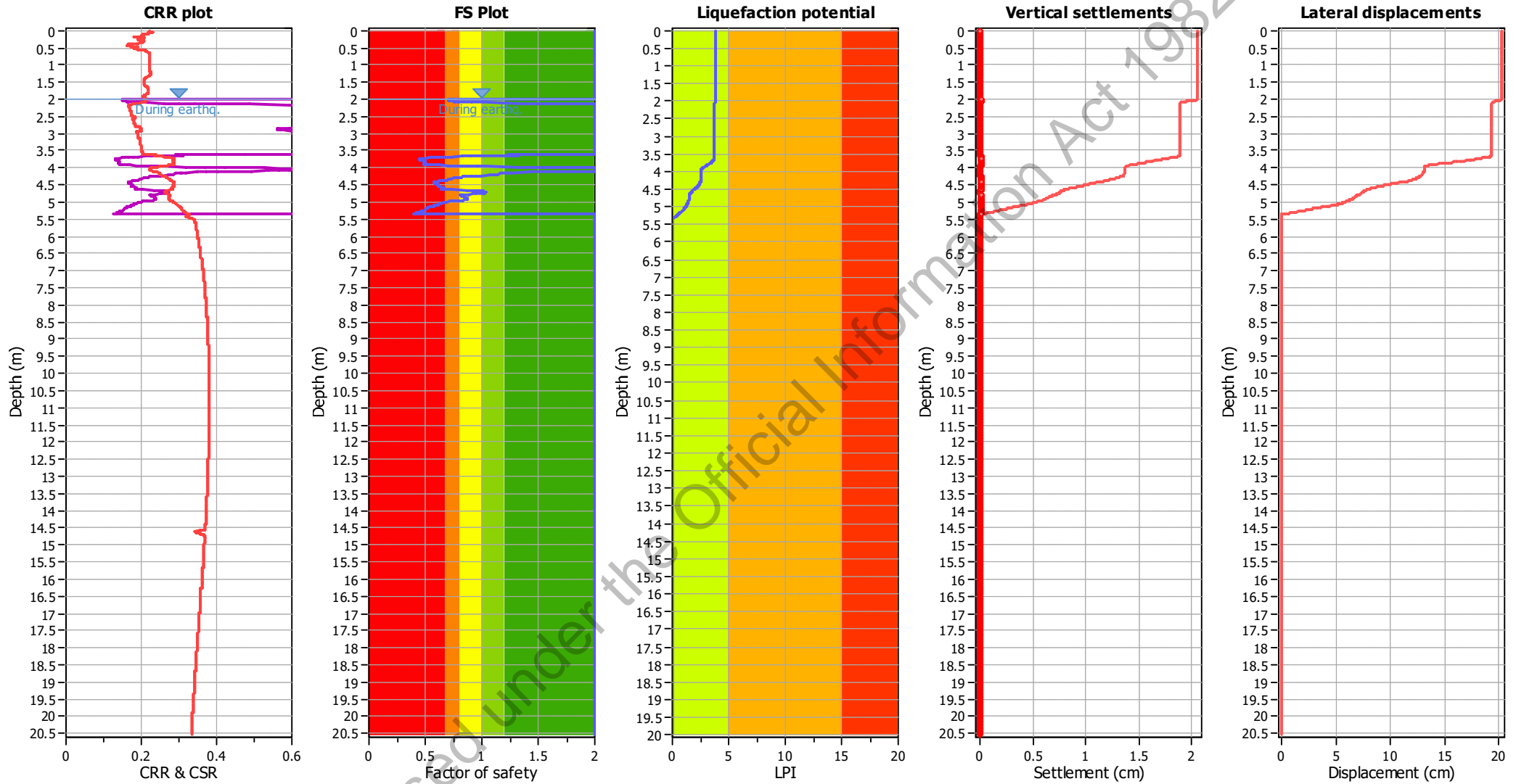
Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_{\sigma}$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained



### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.41	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_q$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

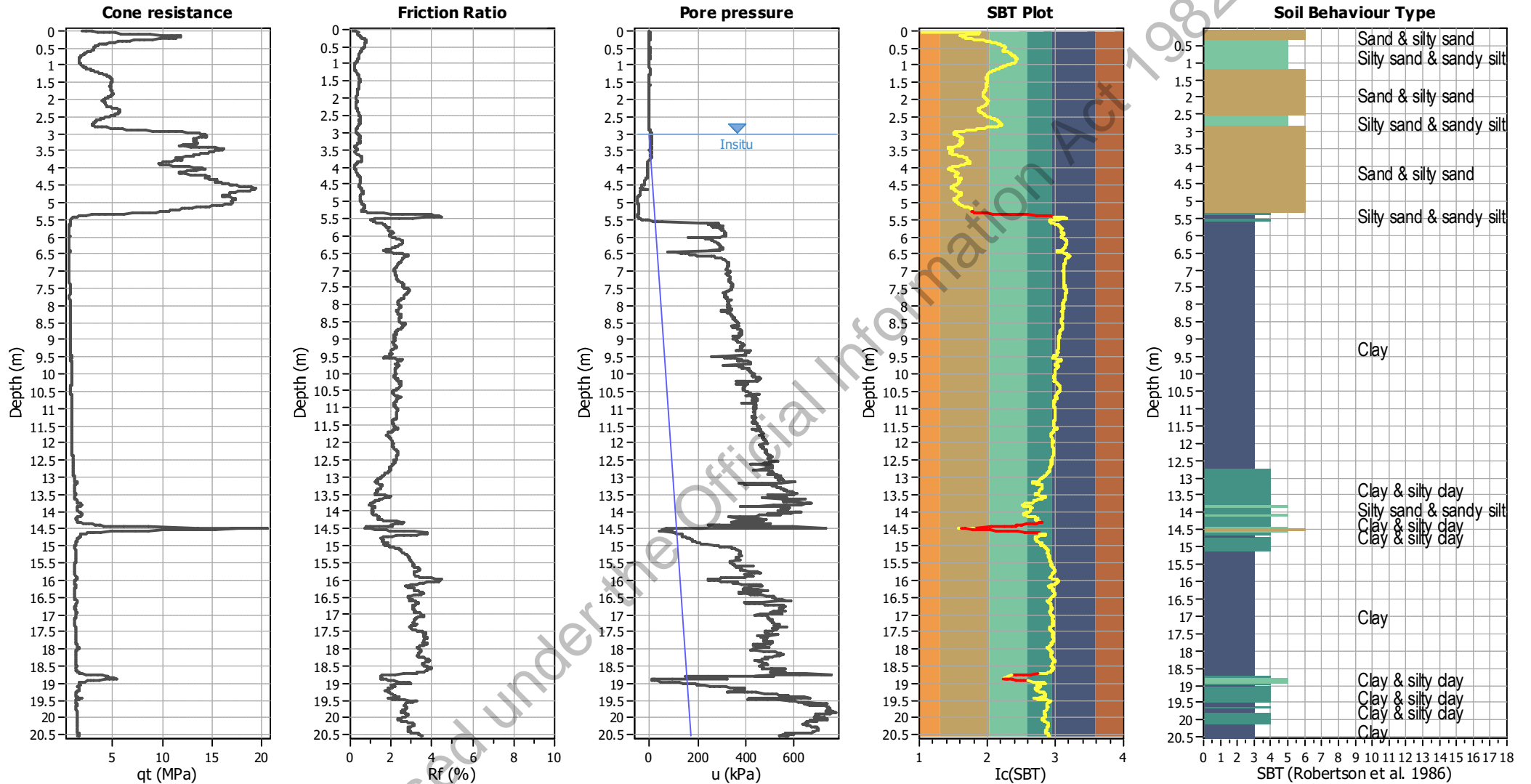
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



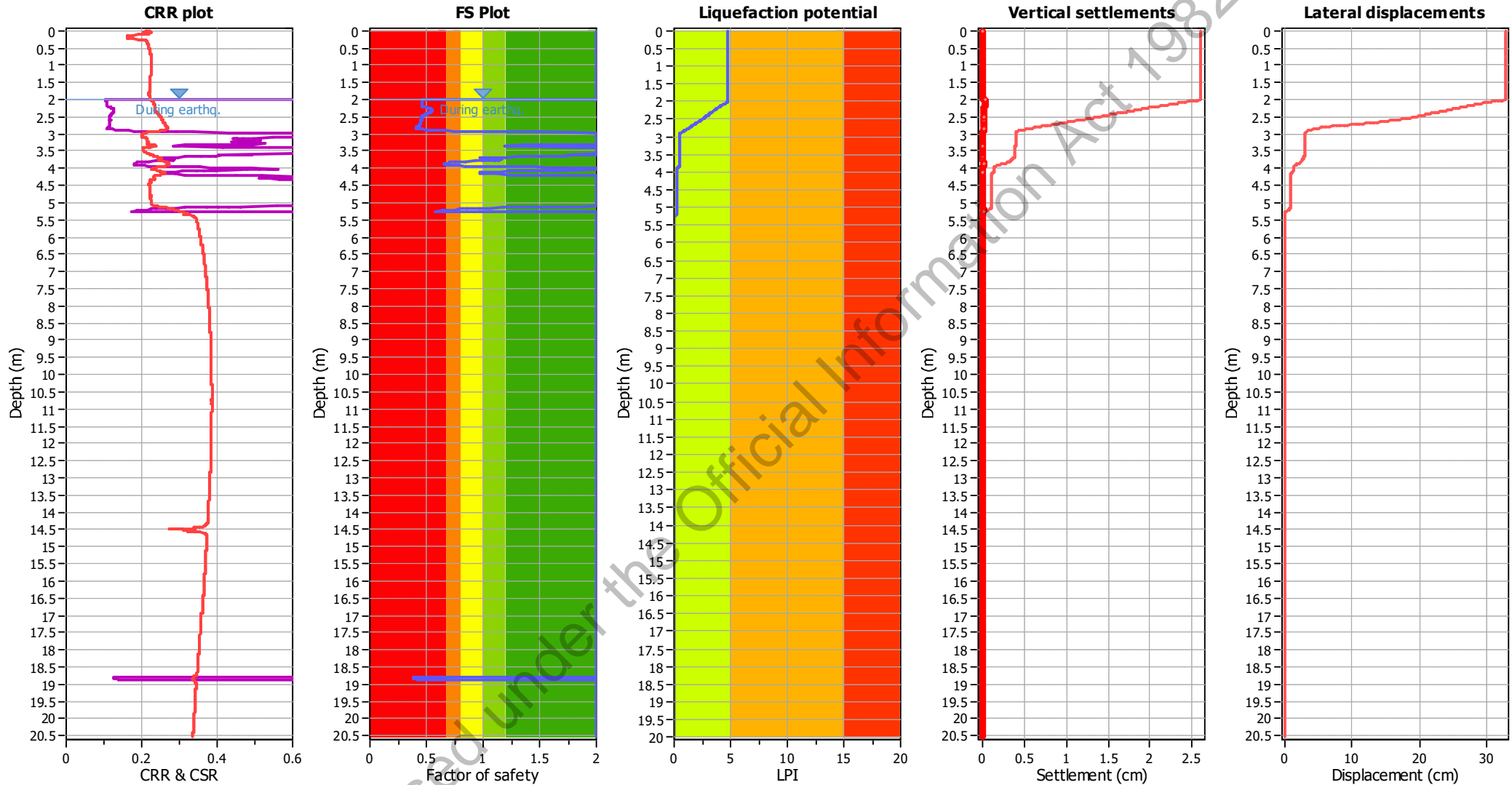
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_{\sigma}$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.41	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_q$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

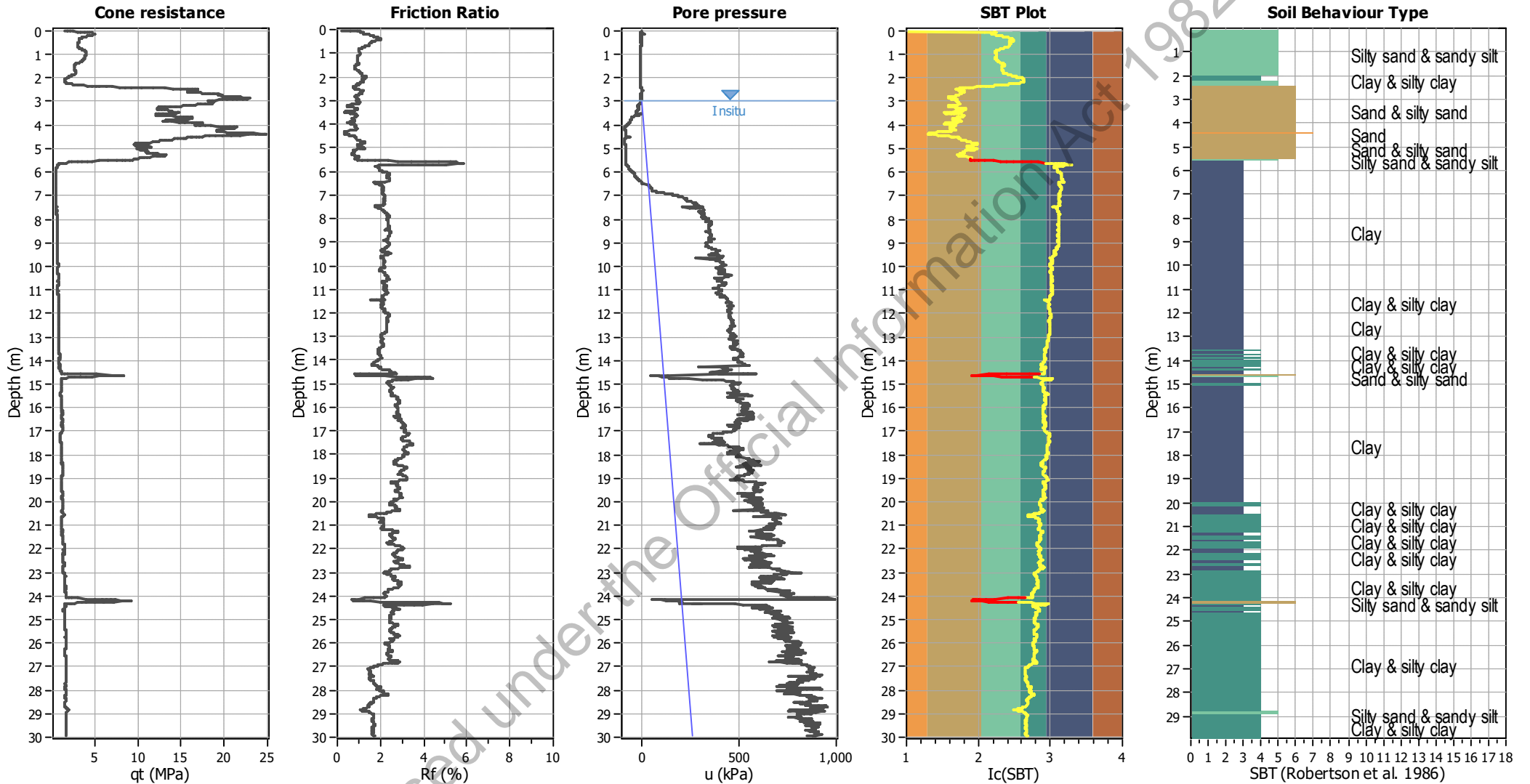
#### F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

#### LPI color scheme

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



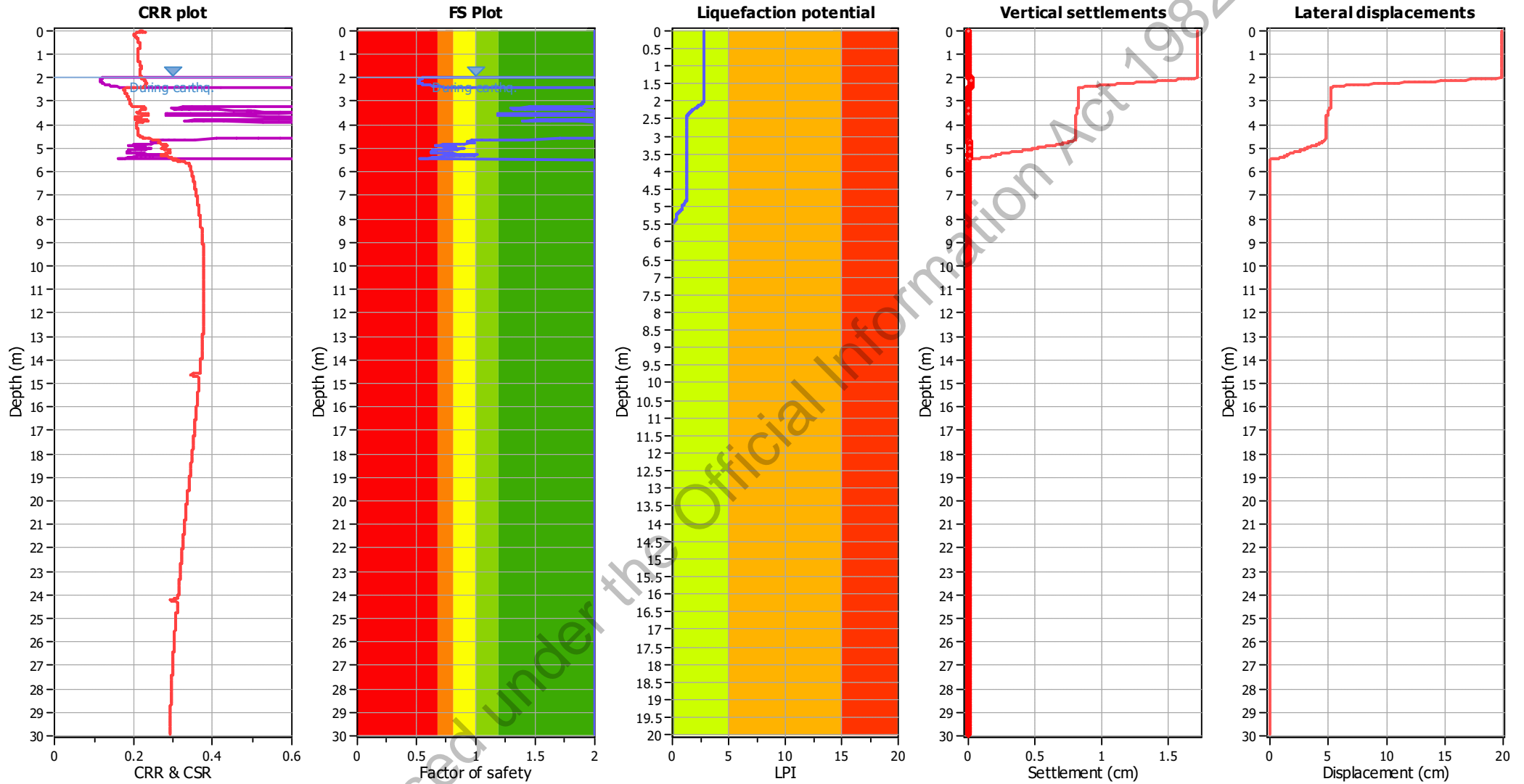
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>q</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m
Fines correction method:	B&I (2014)	Average results interval:	3
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT
Peak ground acceleration:	0.41	Use fill:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_q$ applied:	Yes
Clay like behavior applied:	Sands only
Limit depth applied:	No
Limit depth:	N/A

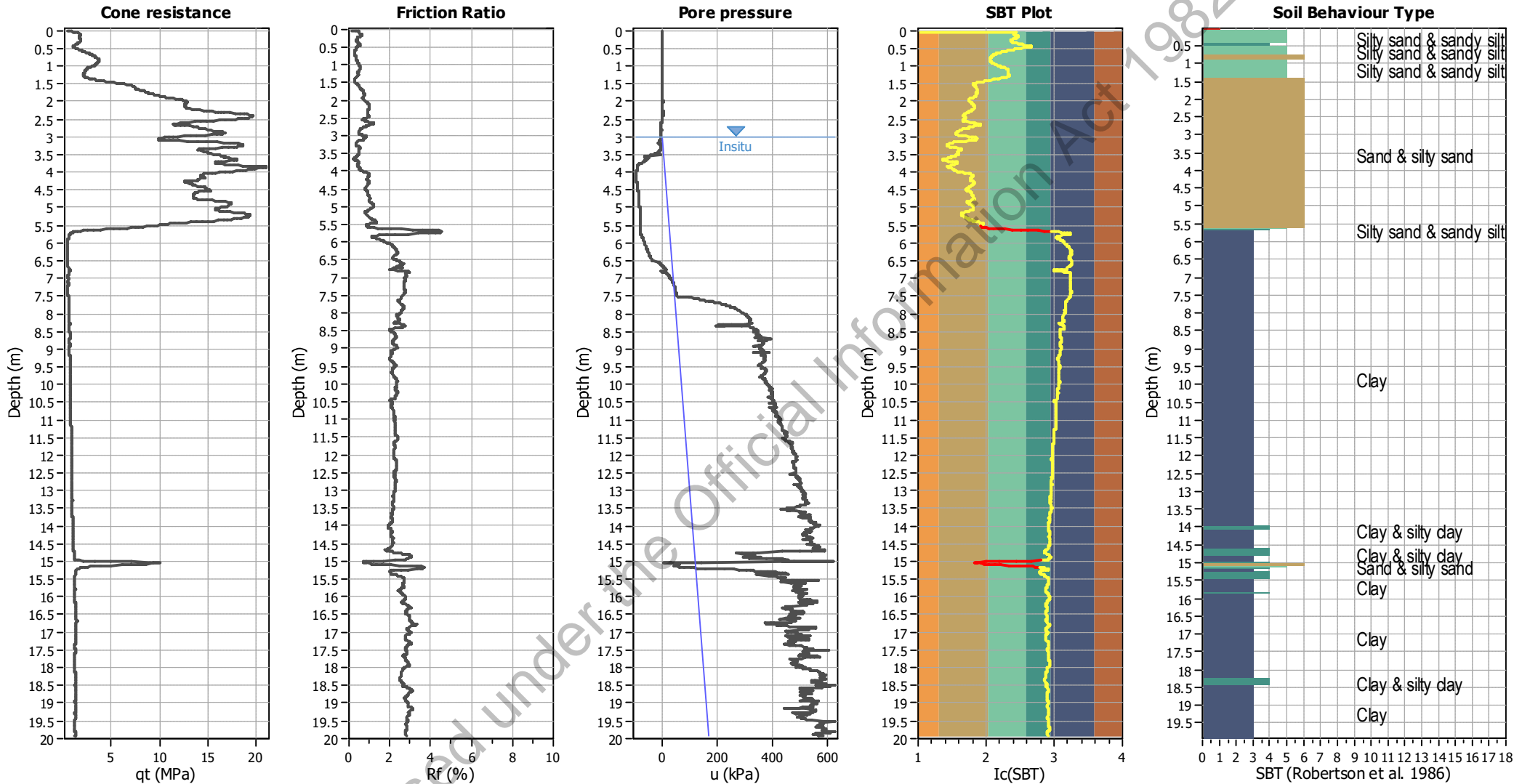
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



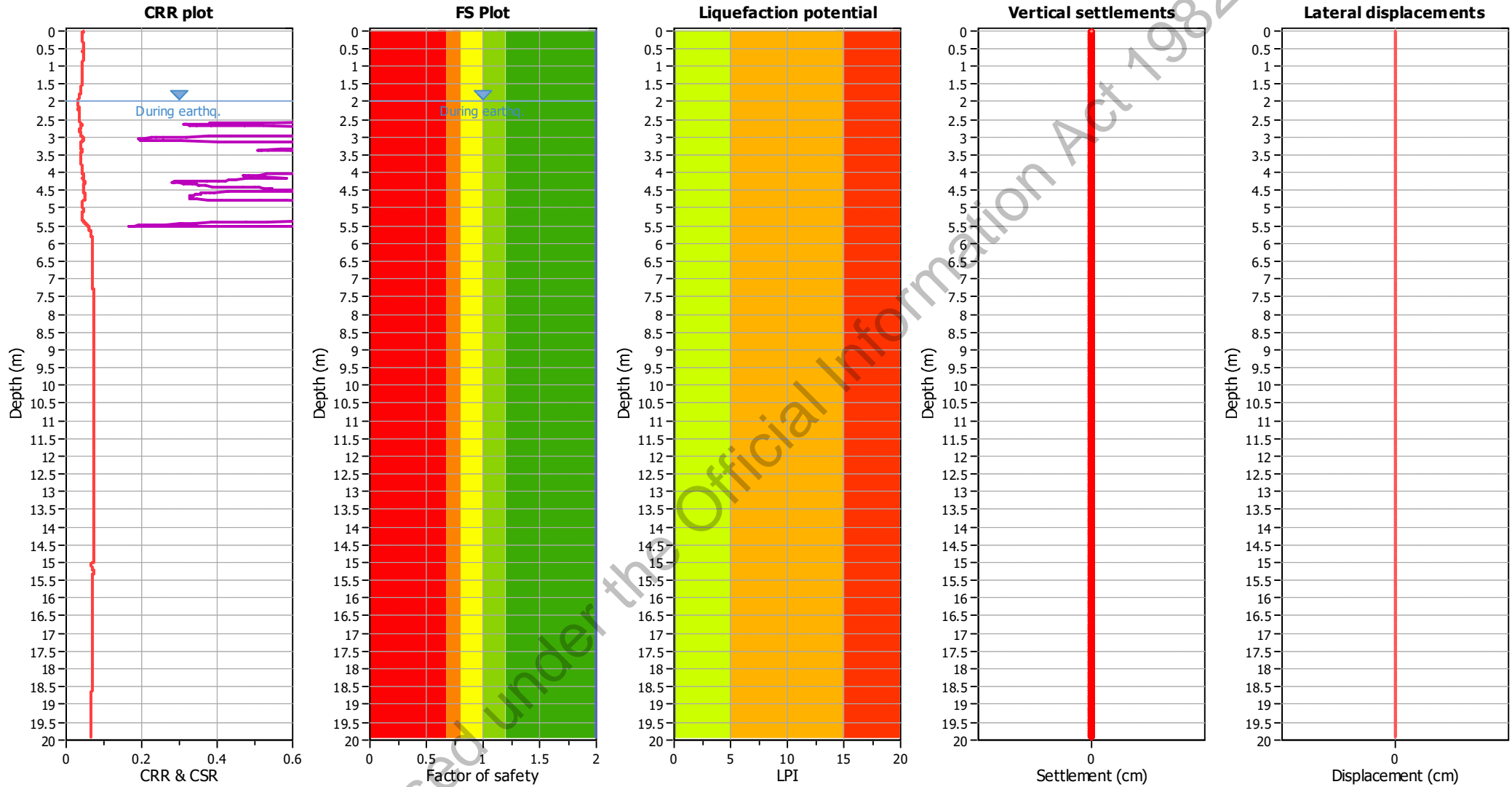
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_v$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.08	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_q$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.08	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

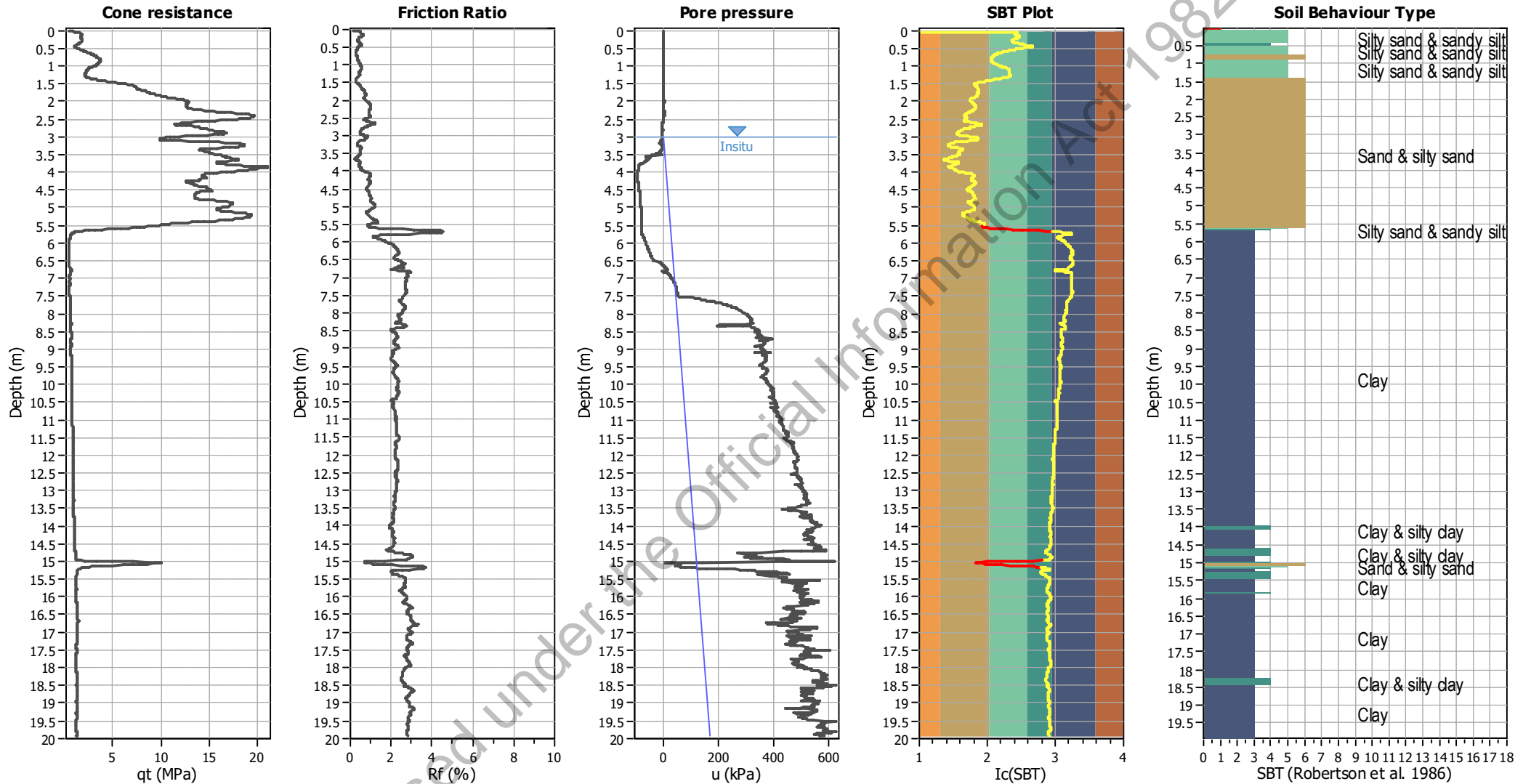
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



#### Input parameters and analysis data

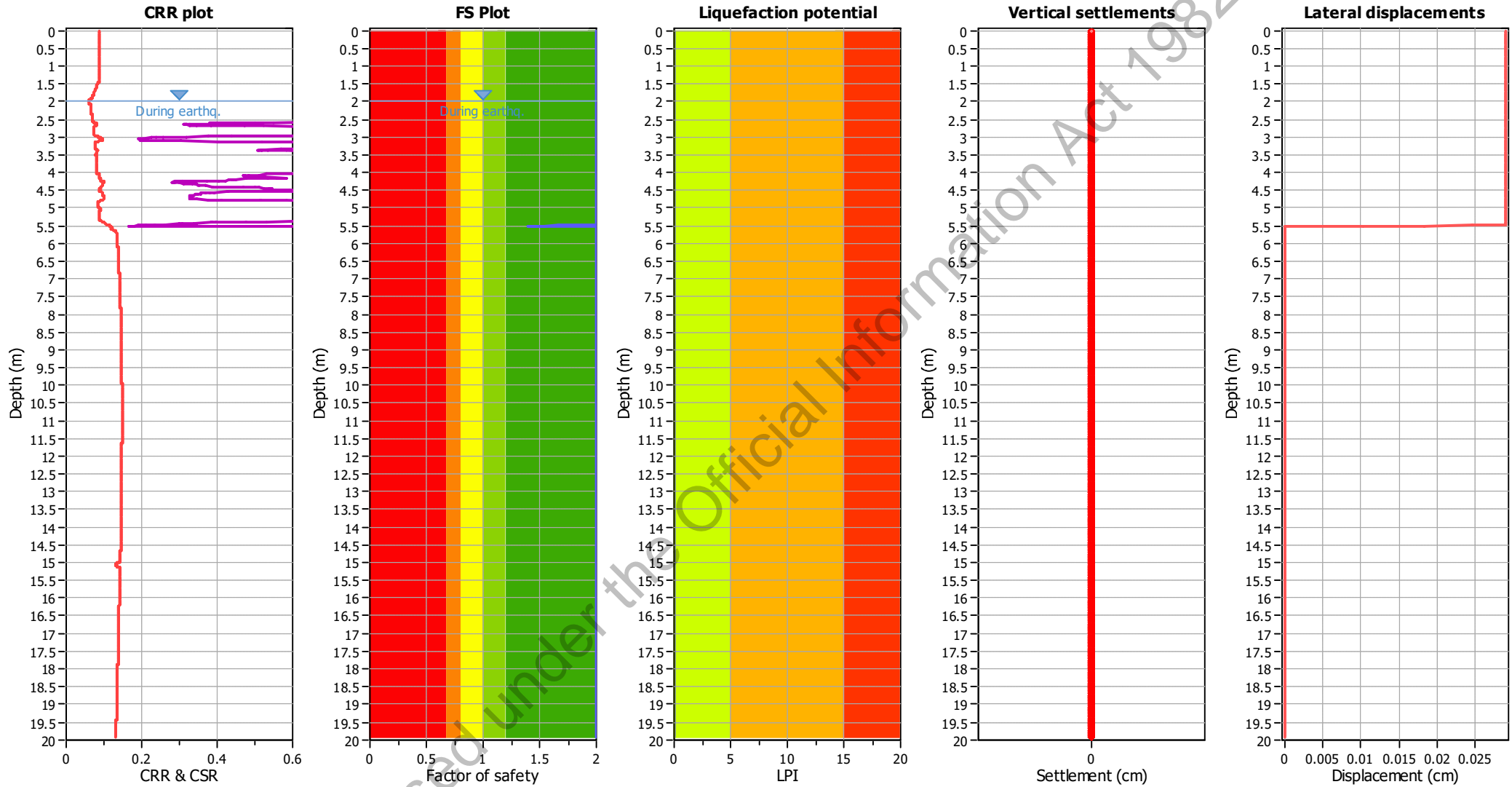
Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>q</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.16	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained



### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_q$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.16	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

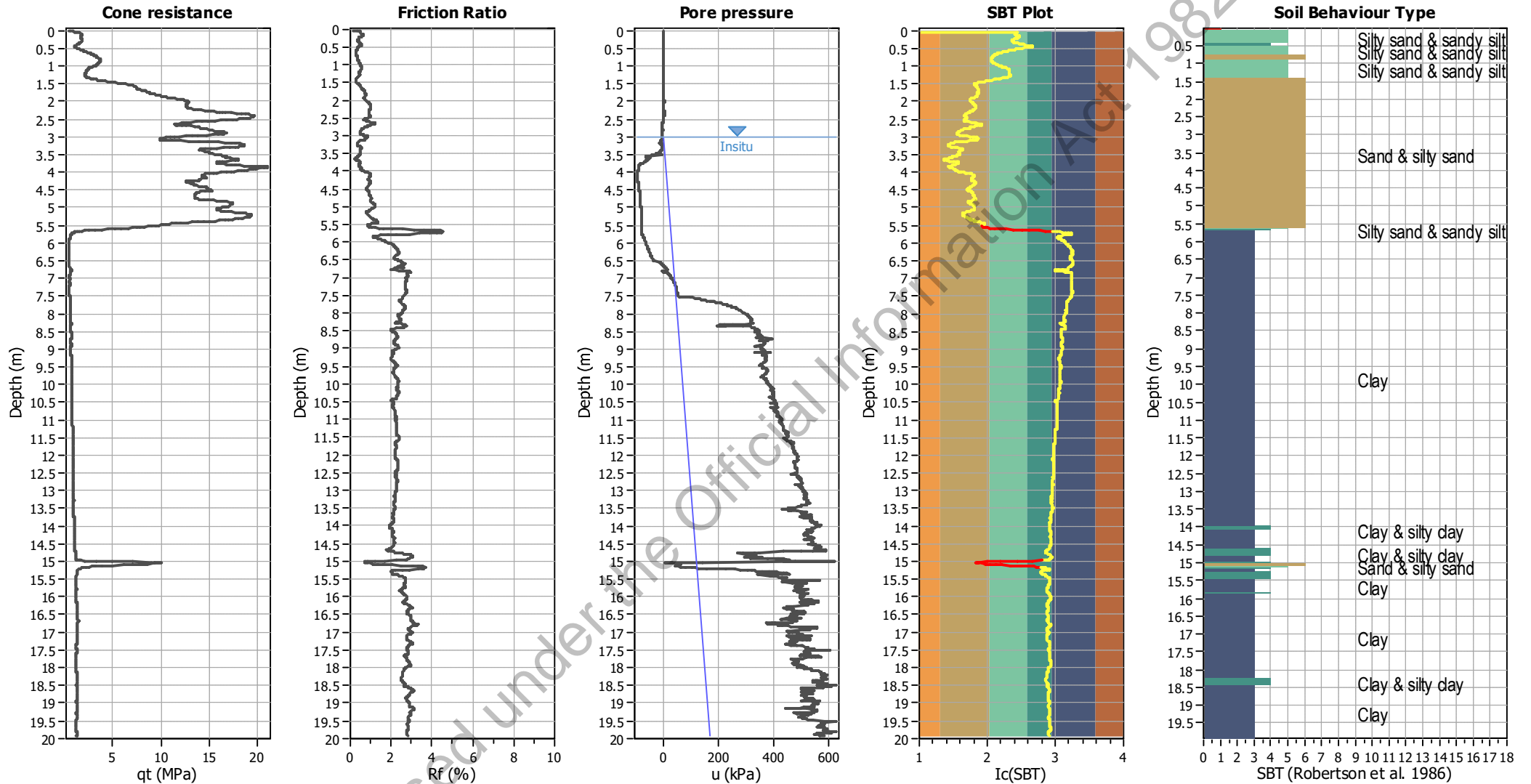
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



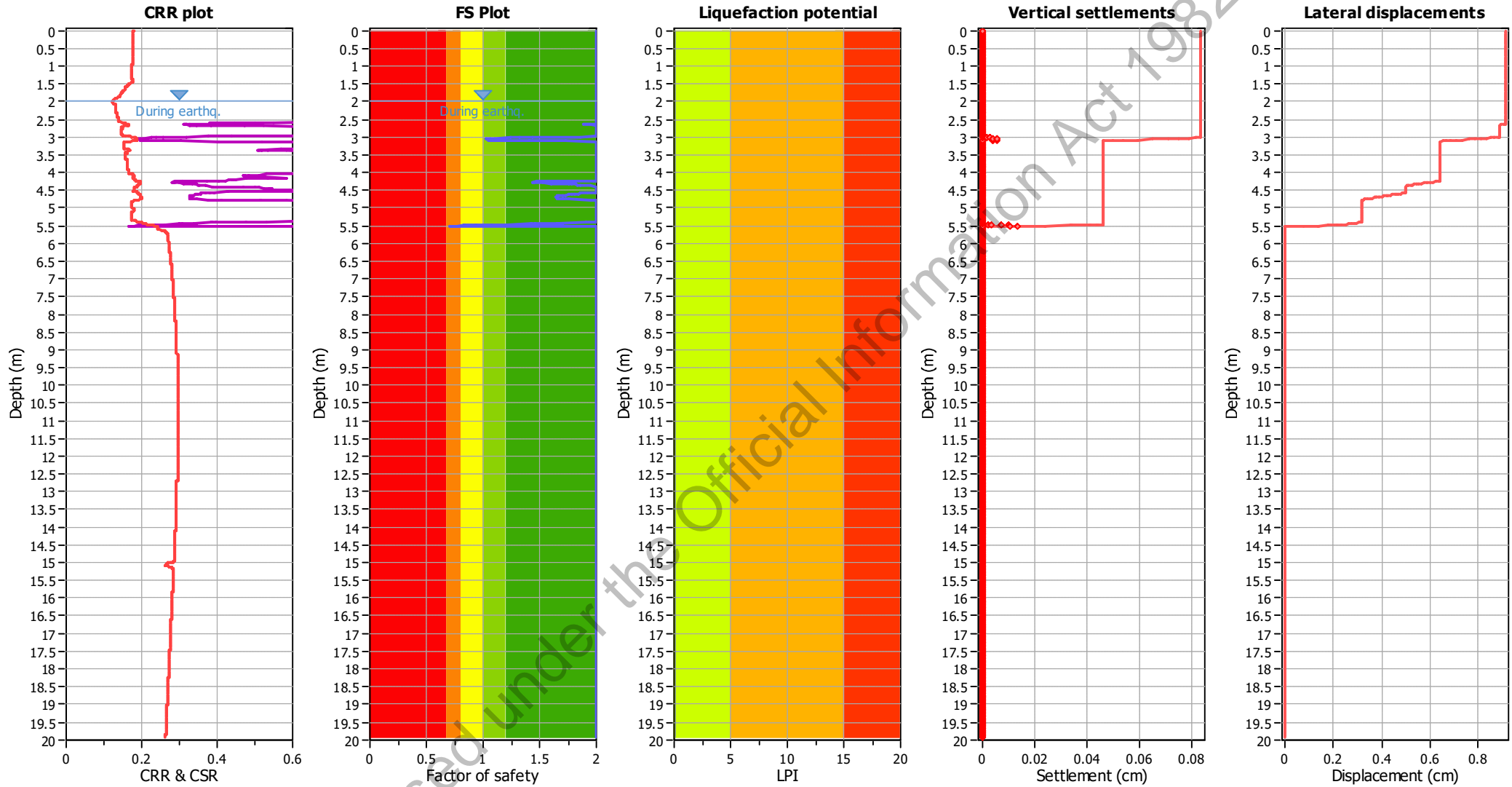
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>q</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.32	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



**Input parameters and analysis data**

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_q$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.32	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

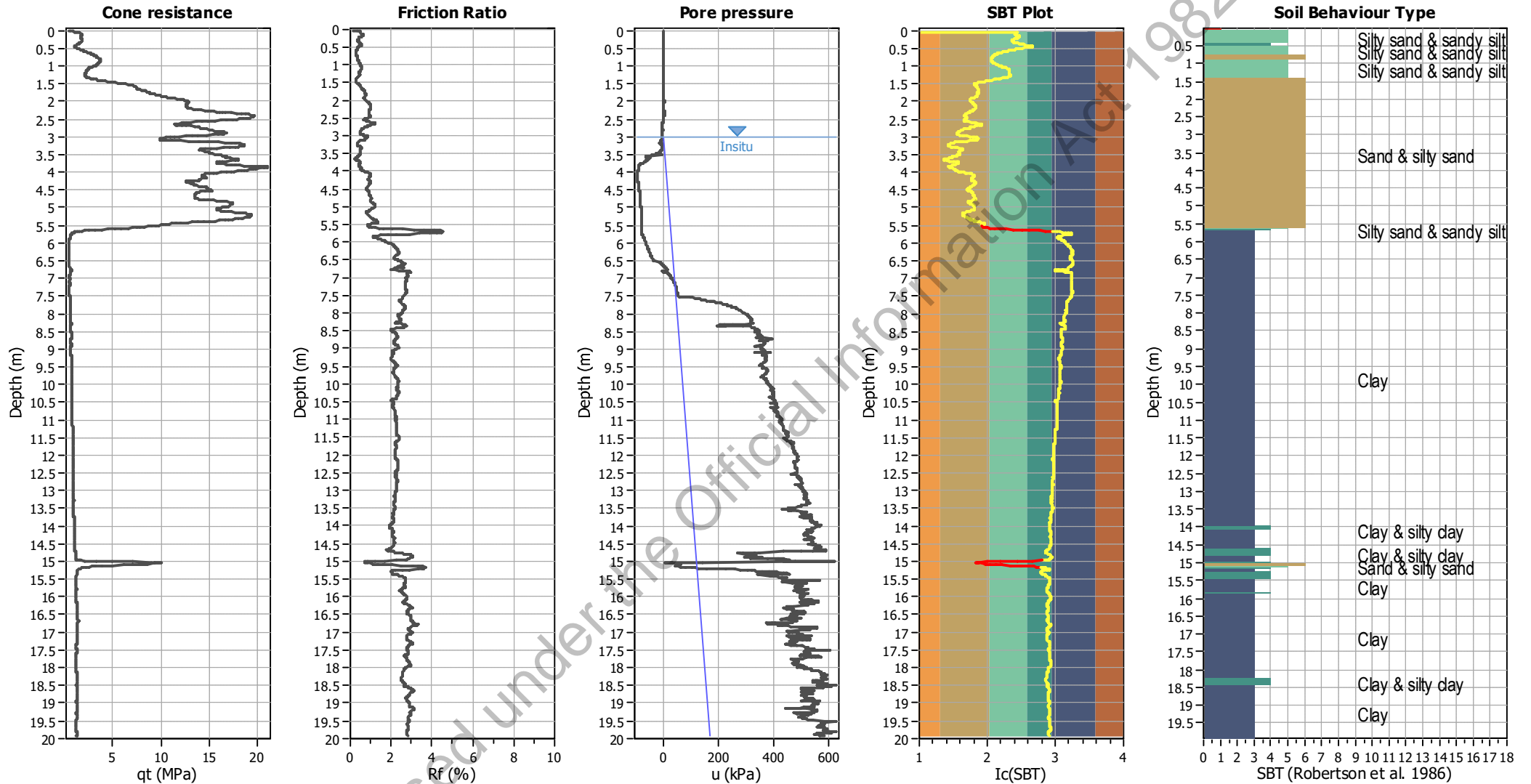
**F.S. color scheme**

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

**LPI color scheme**

- Very high risk
- High risk
- Low risk

### CPT basic interpretation plots



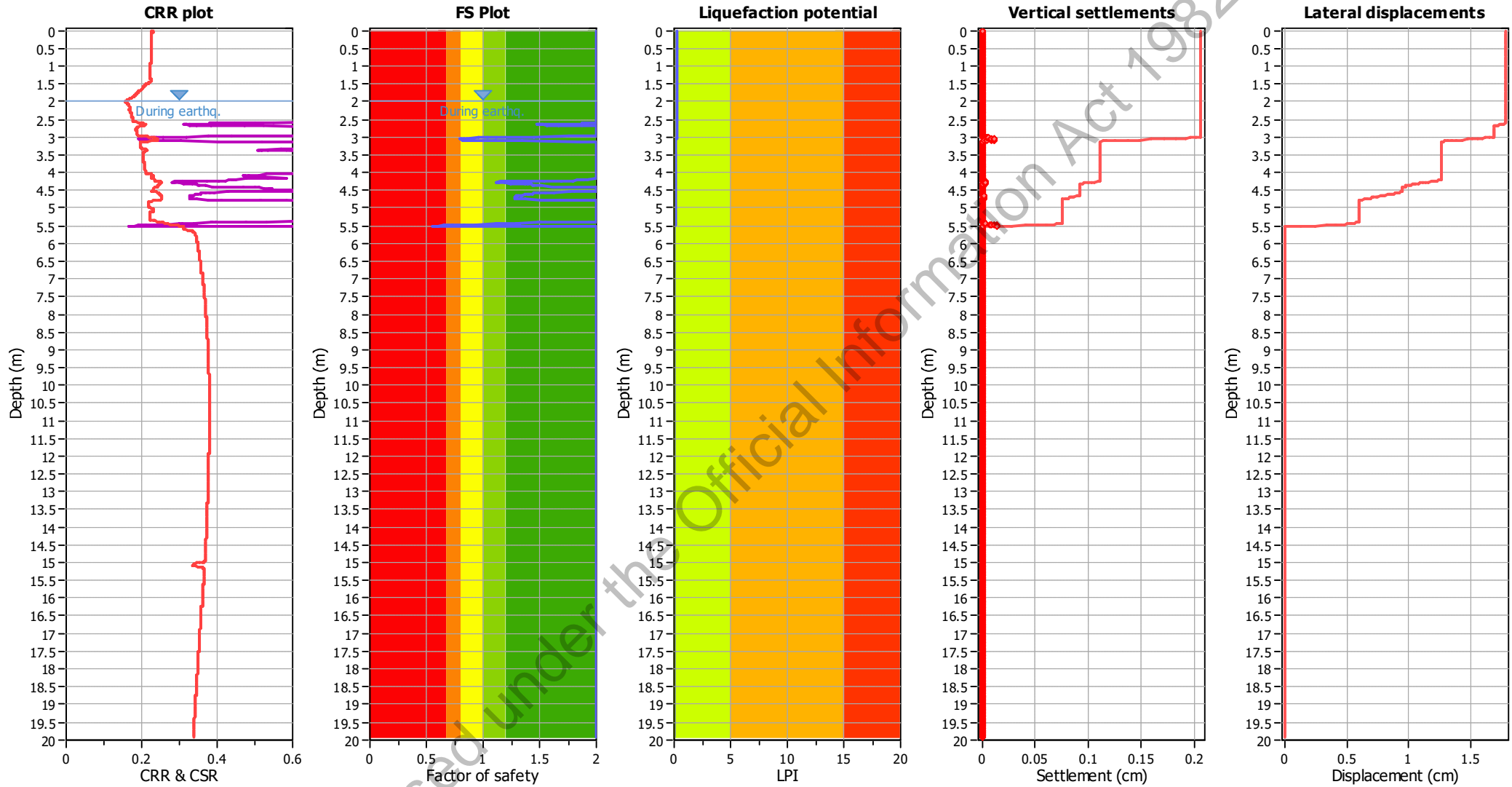
#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_{\sigma}$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

### Liquefaction analysis overall plots



#### Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (earthq.):	2.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_q$ applied:	Yes
Earthquake magnitude $M_w$ :	6.40	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

#### F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

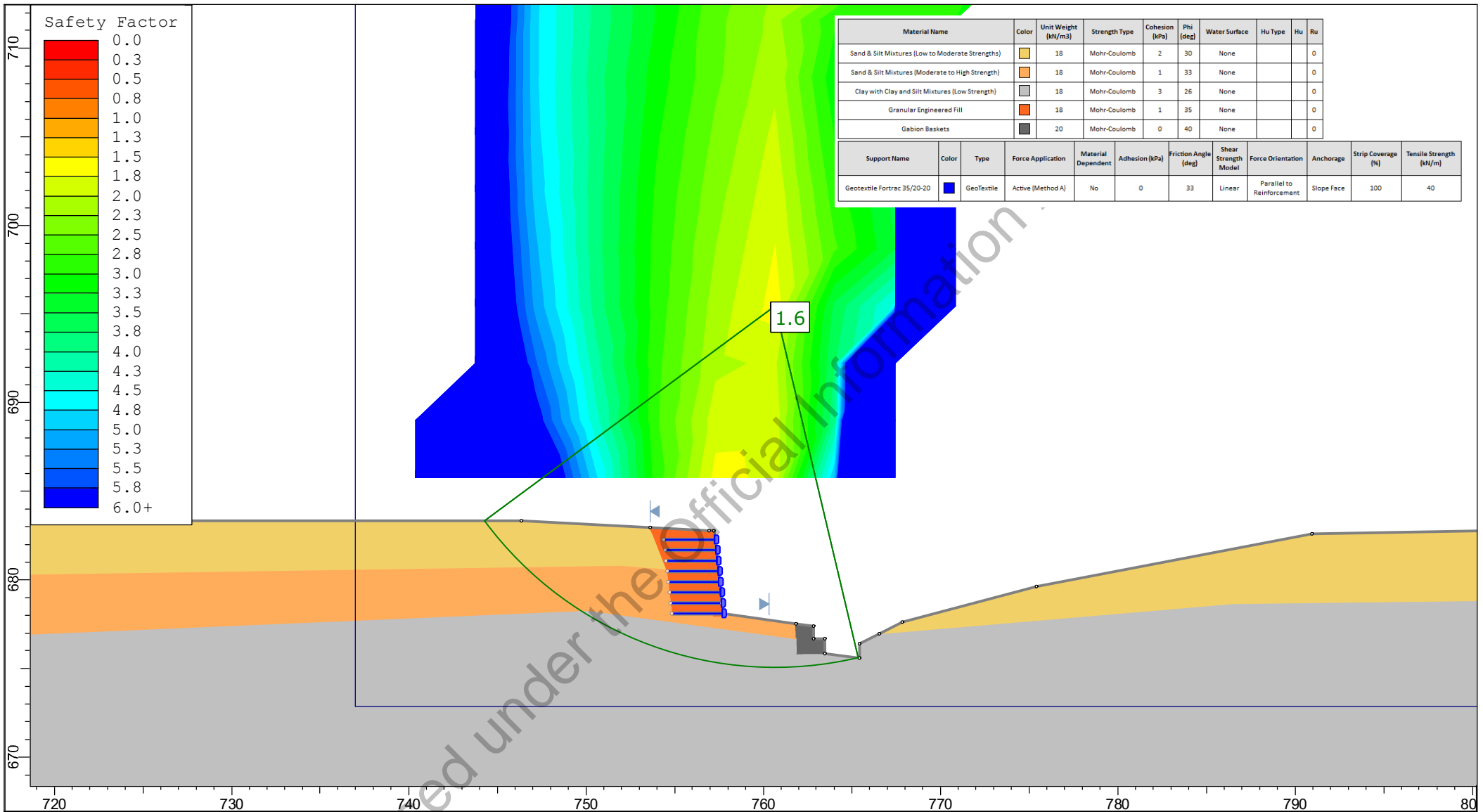
#### LPI color scheme

- Very high risk
- High risk
- Low risk

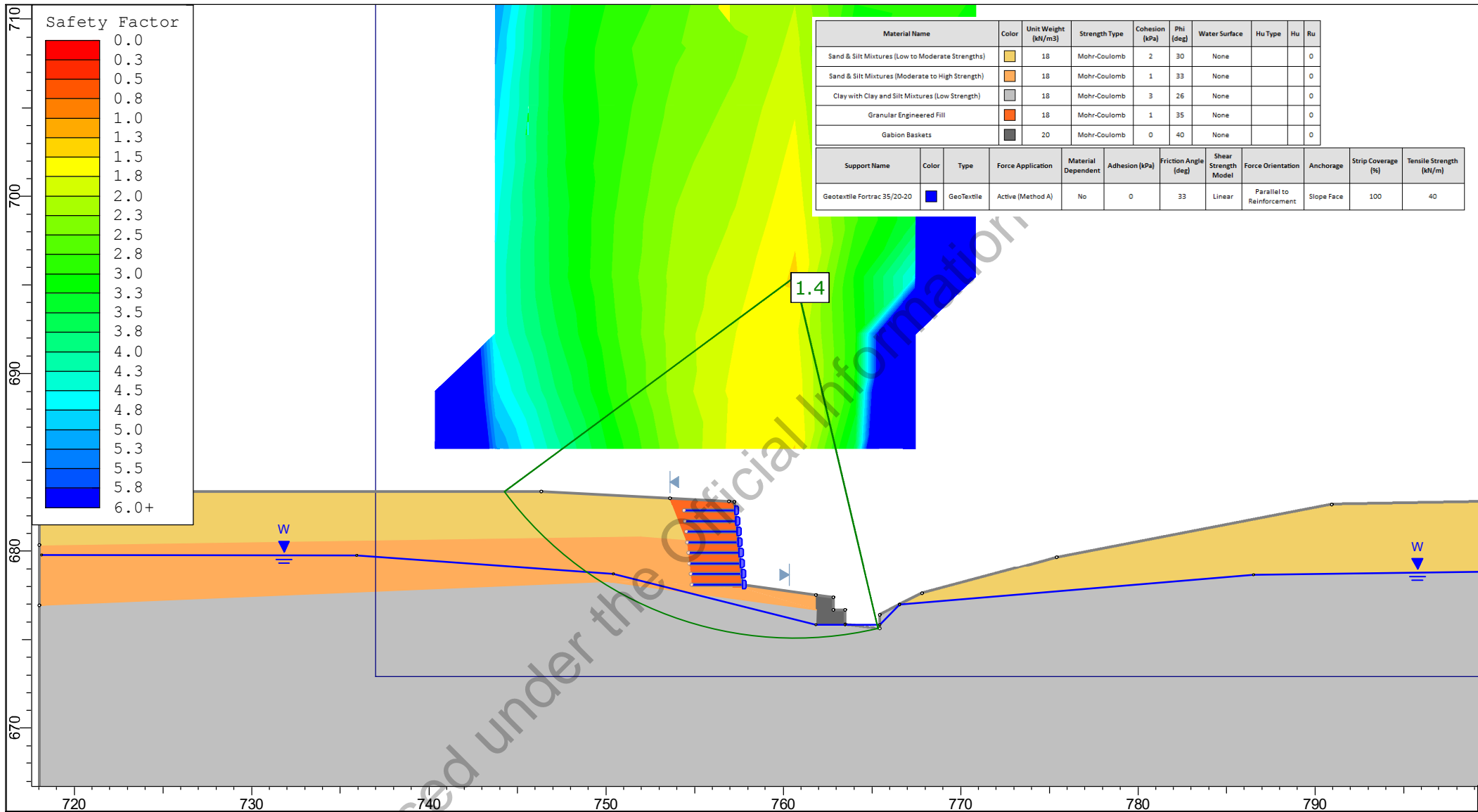
**APPENDIX E**  
**SLOPE STABILITY ANALYSES**

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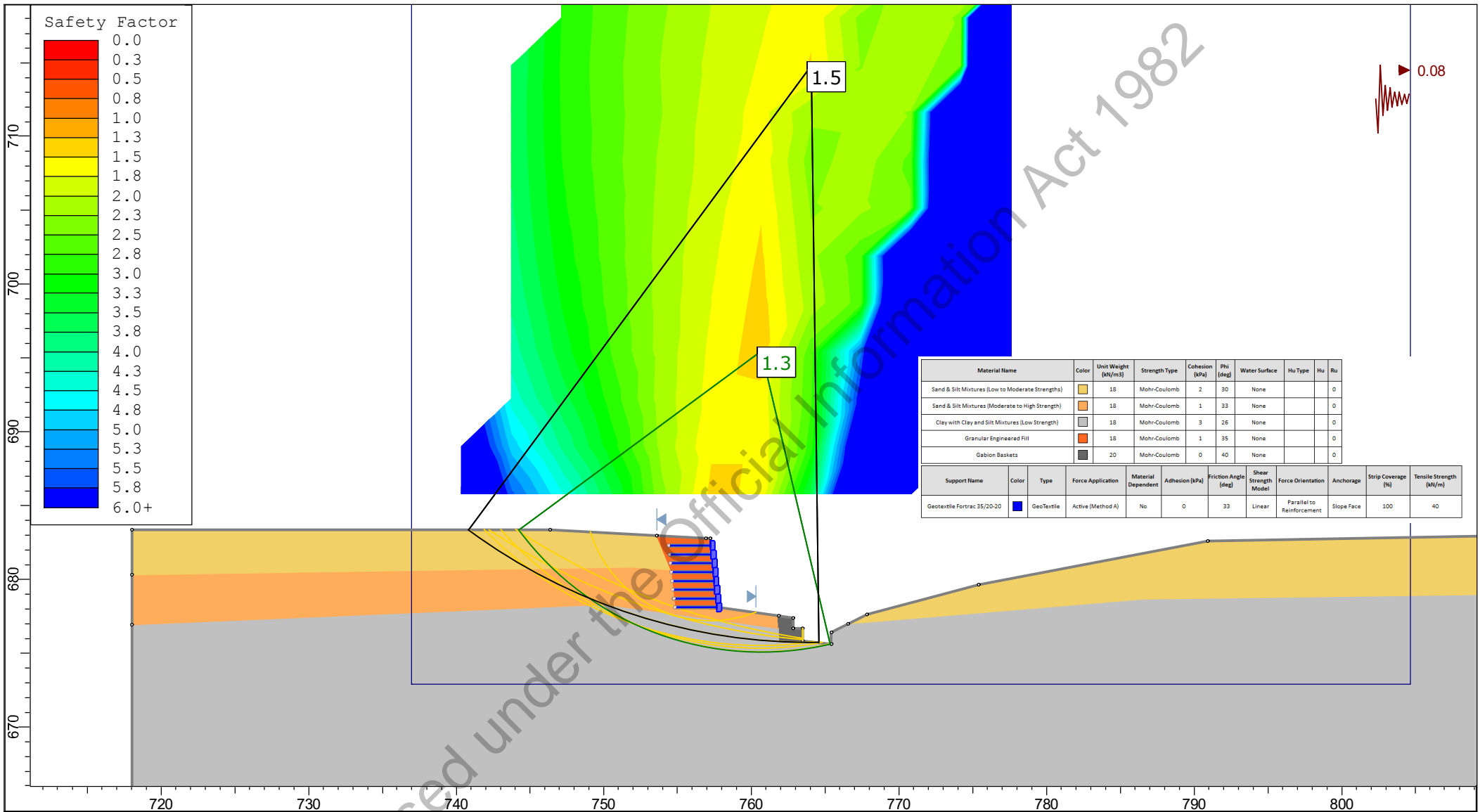


Project				Slope Stability Assessment - Mangapapa School			
Analysis Description				Cross Section B-B'			
Drawn By	JAM	Scale	1:300	Company	LDE Ltd		
Date	25/07/2019			File Name	15344 - Cross Section B-B'.sldm		

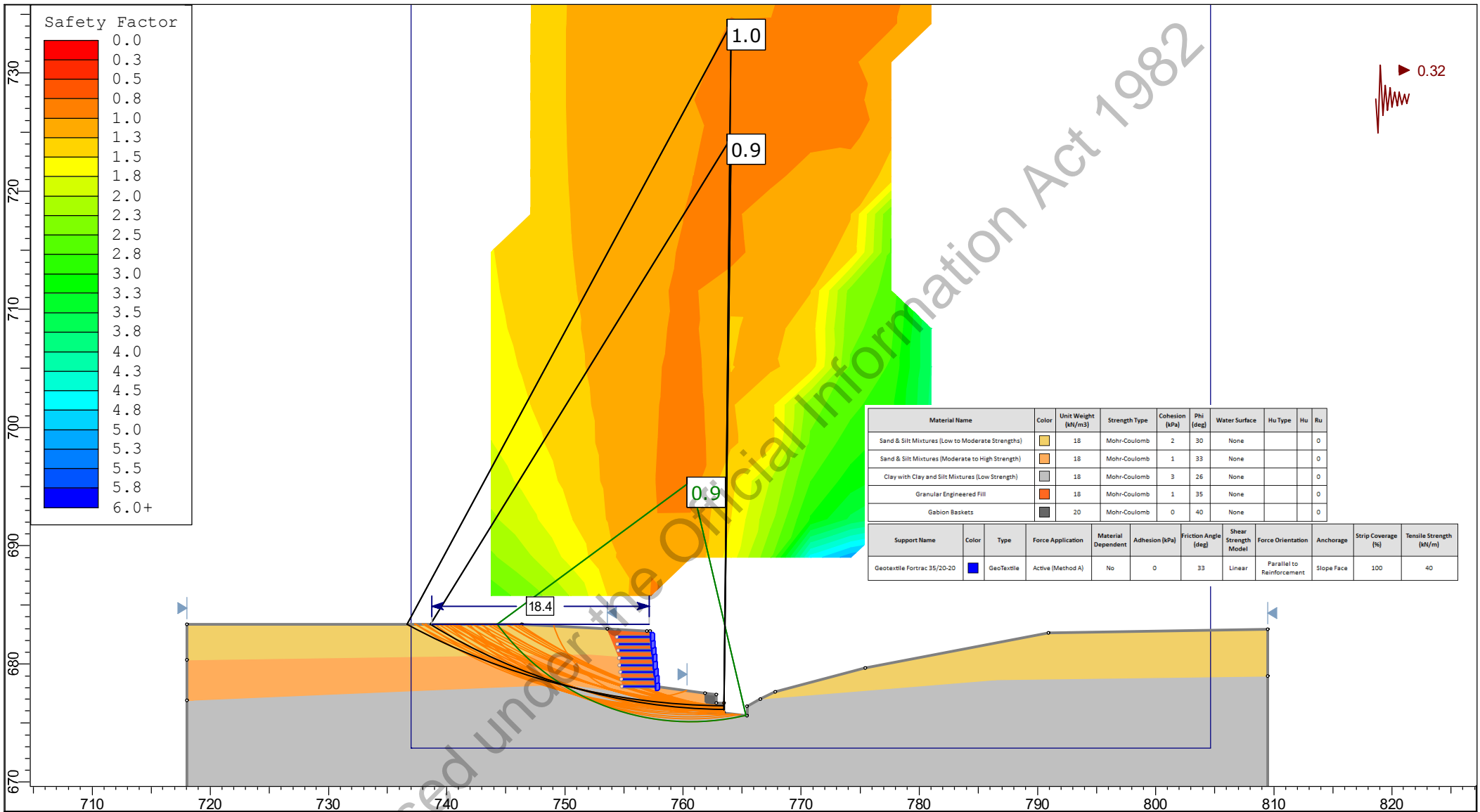


Project				Slope Stability Assessment - Mangapapa School			
Analysis Description				Cross Section B-B'			
Drawn By	JAM	Scale	1:300	Company	LDE Ltd		
Date	25/07/2019			File Name	15344 - Cross Section B-B'.sldm		

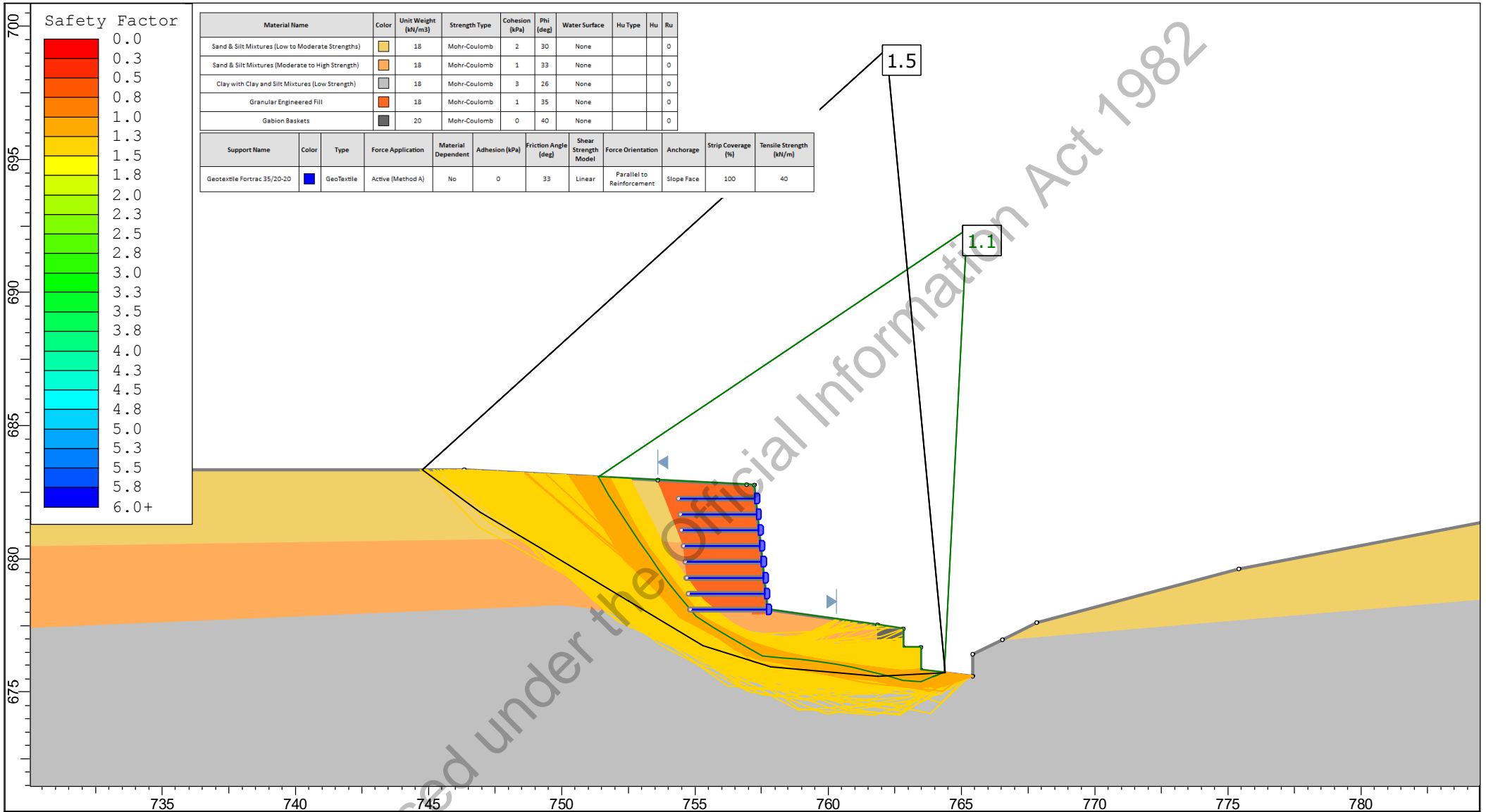




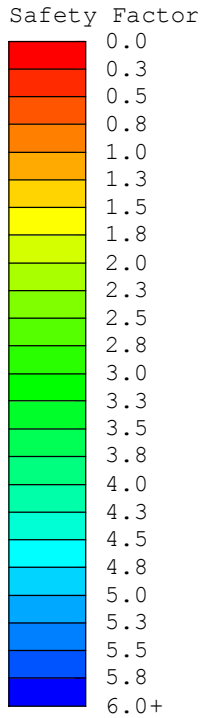
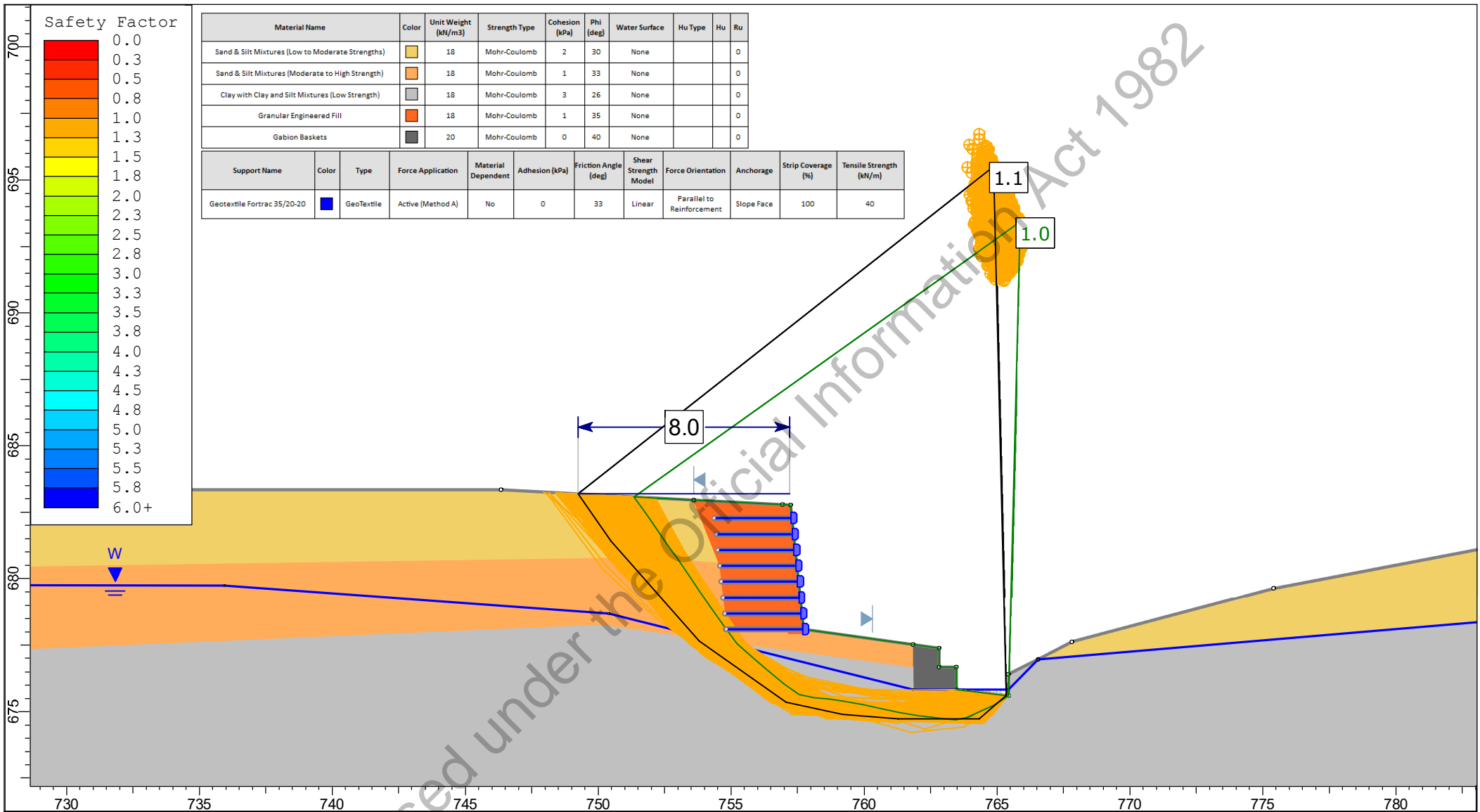
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Analysis Description		Cross Section B-B'	
Drawn By	JAM	Scale	1:360
		Company	LDE Ltd
Date	25/07/2019	File Name	15344 - Cross Section B-B'.sldm



	Project			Slope Stability Assessment - Mangapapa School		
	Analysis Description			Cross Section B-B'		
	Drawn By	JAM	Scale	1:450	Company	LDE Ltd
	Date	25/07/2019	File Name	15344 - Cross Section B-B'.sldm		



Project		Slope Stability Assessment - Mangapapa School	
Analysis Description		Cross Section B-B' - Non-Circular Analysis	
Drawn By	JAM	Scale	1:200
		Company	LDE Ltd
Date	25/07/2019	File Name	15344 - Cross Section B-B' - Non-CircularA.slmd

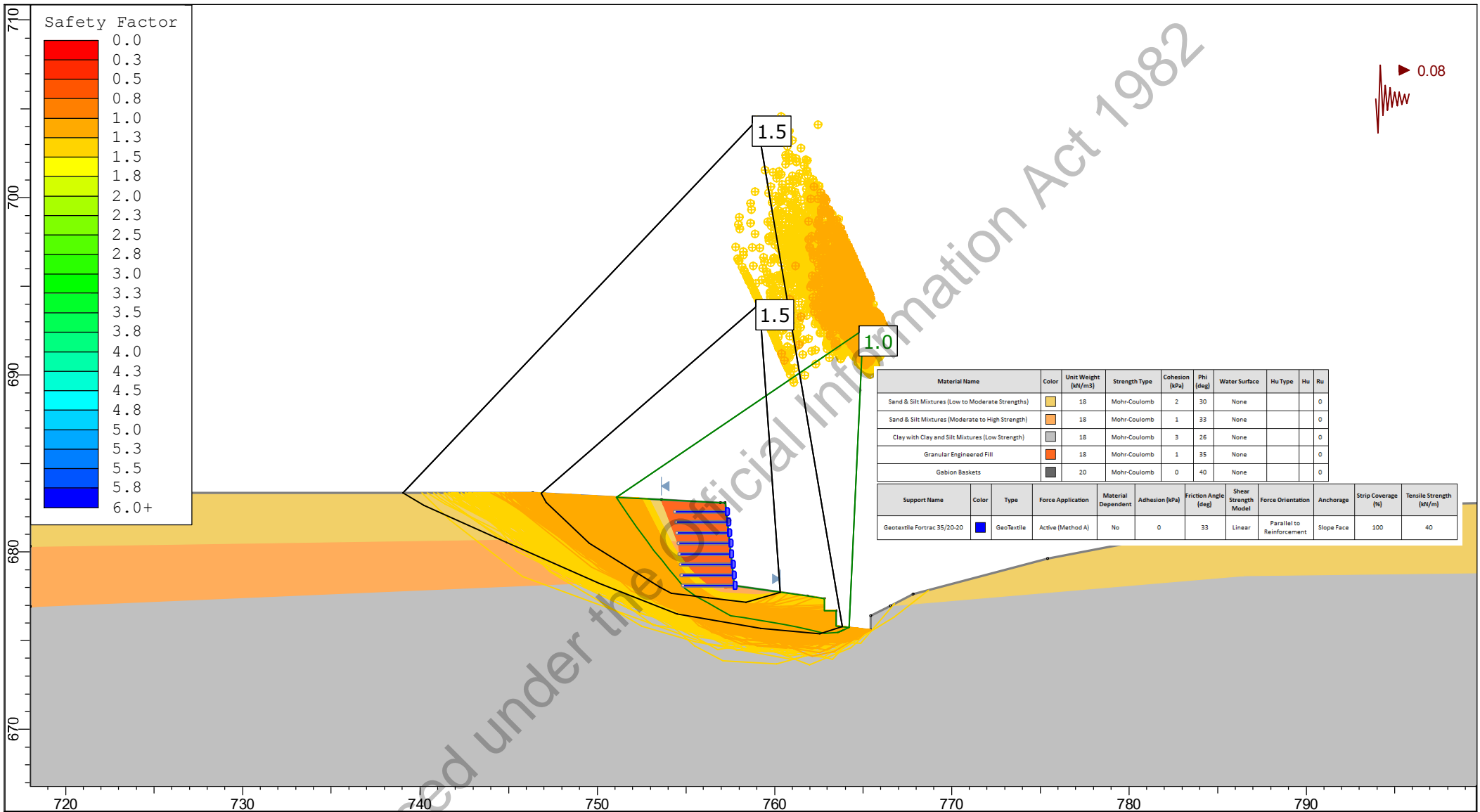


Material Name	Color	Unit Weight (kN/m <sup>3</sup> )	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Hu Type	Hu	Ru
Sand & Silt Mixtures (Low to Moderate Strengths)	Yellow	18	Mohr-Coulomb	2	30	None			0
Sand & Silt Mixtures (Moderate to High Strength)	Orange	18	Mohr-Coulomb	1	33	None			0
Clay with Clay and Silt Mixtures (Low Strength)	Grey	18	Mohr-Coulomb	3	26	None			0
Granular Engineered Fill	Red	18	Mohr-Coulomb	1	35	None			0
Gabion Baskets	Dark Grey	20	Mohr-Coulomb	0	40	None			0

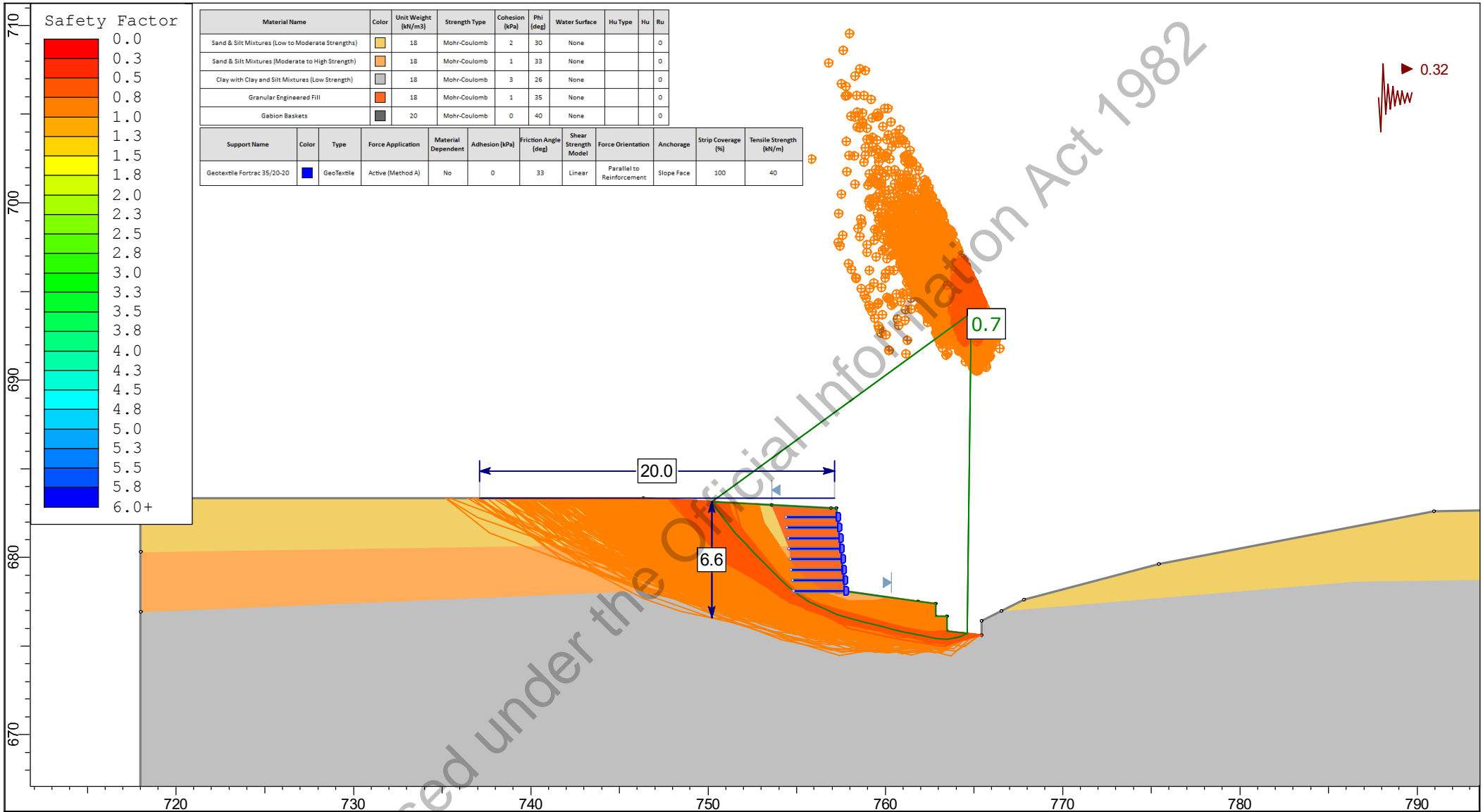
Support Name	Color	Type	Force Application	Material Dependent	Adhesion (kPa)	Friction Angle (deg)	Shear Strength Model	Force Orientation	Anchorage	Strip Coverage (%)	Tensile Strength (kN/m)
Geotextile Fortrac 35/20-20	Blue	GeoTextile	Active (Method A)	No	0	33	Linear	Parallel to Reinforcement	Slope Face	100	40



Project		Slope Stability Assessment - Mangapapa School	
Analysis Description		Cross Section B-B'	
Drawn By	JAM	Scale	1:200
		Company	LDE Ltd
Date	25/07/2019	File Name	15344 - Cross Section B-B' - Non-CircularA.slmd



Project		Slope Stability Assessment - Mangapapa School	
Analysis Description		Cross Section B-B'	
Drawn By	JAM	Scale	1:300
Company		LDE Ltd	
Date	25/07/2019	File Name	15344 - Cross Section B-B' - Non-CircularA.slmd

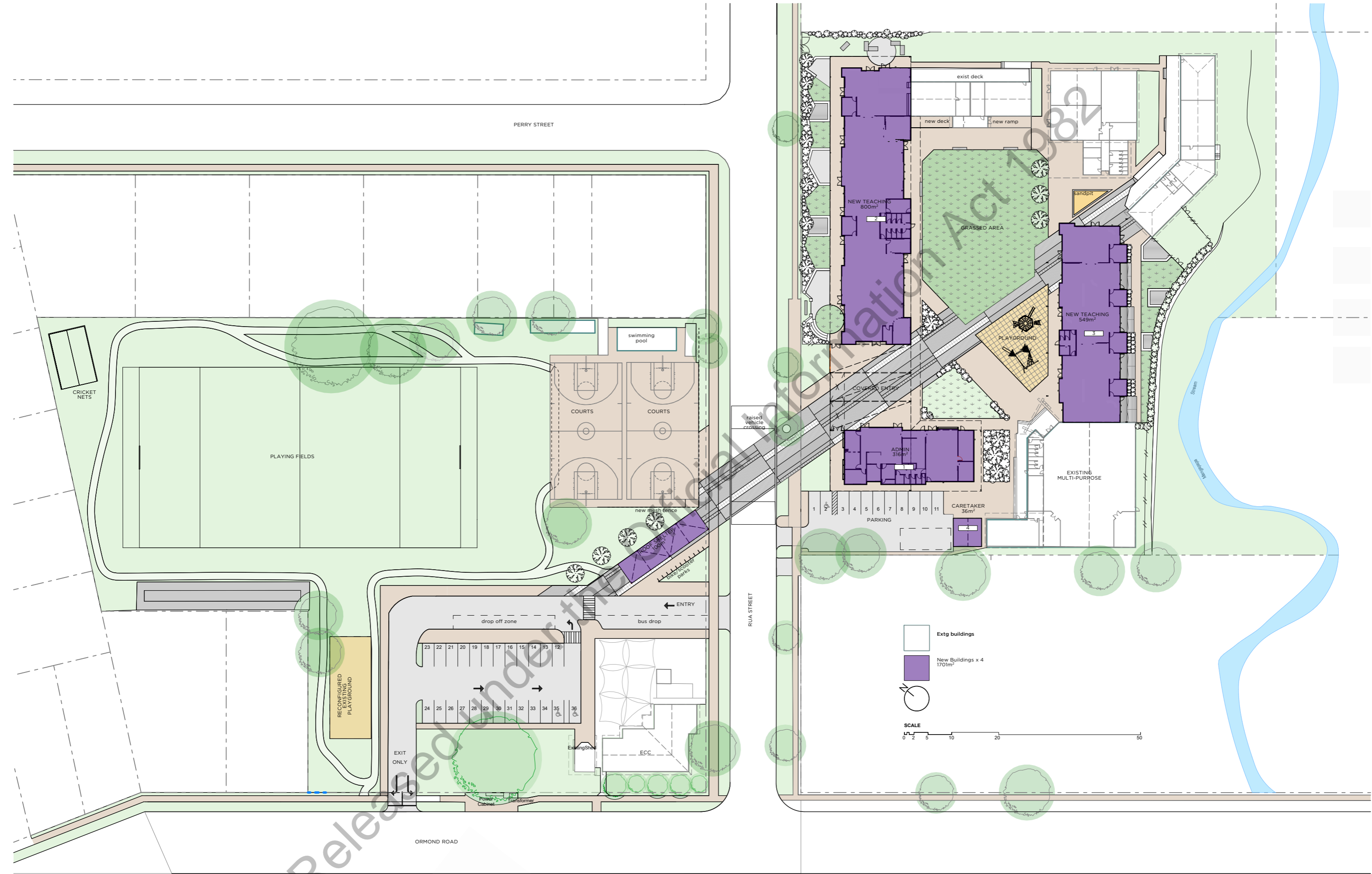


Project				Slope Stability Assessment - Mangapapa School			
Analysis Description				Cross Section B-B'			
Drawn By		JAM		Scale		1:300	
Date		25/07/2019		Company		LDE Ltd	
				File Name		15344 - Cross Section B-B' - Non-CircularA.slmd	

**APPENDIX F**  
**RELEVANT PROVIDED PLANS**

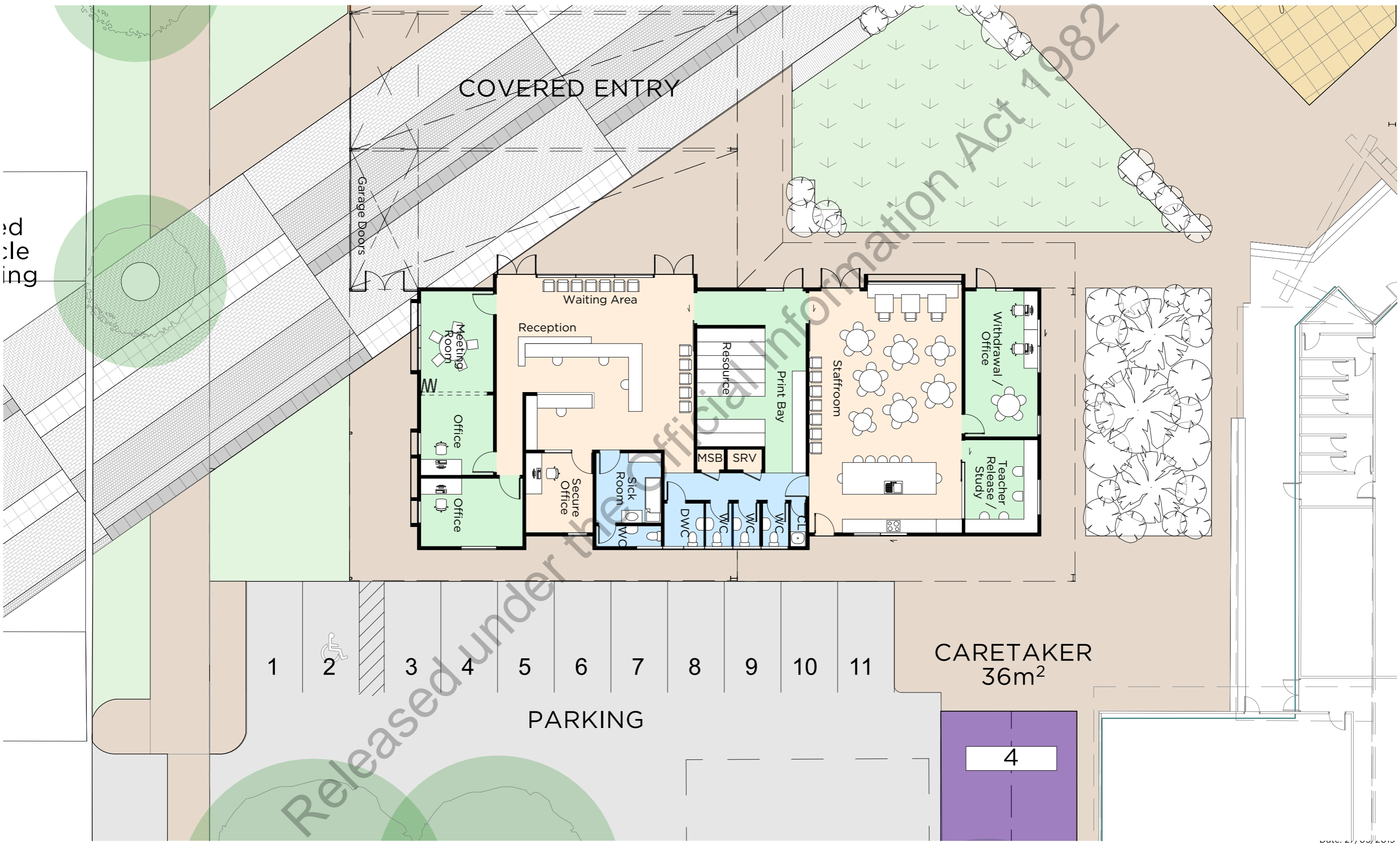
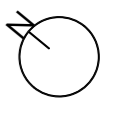
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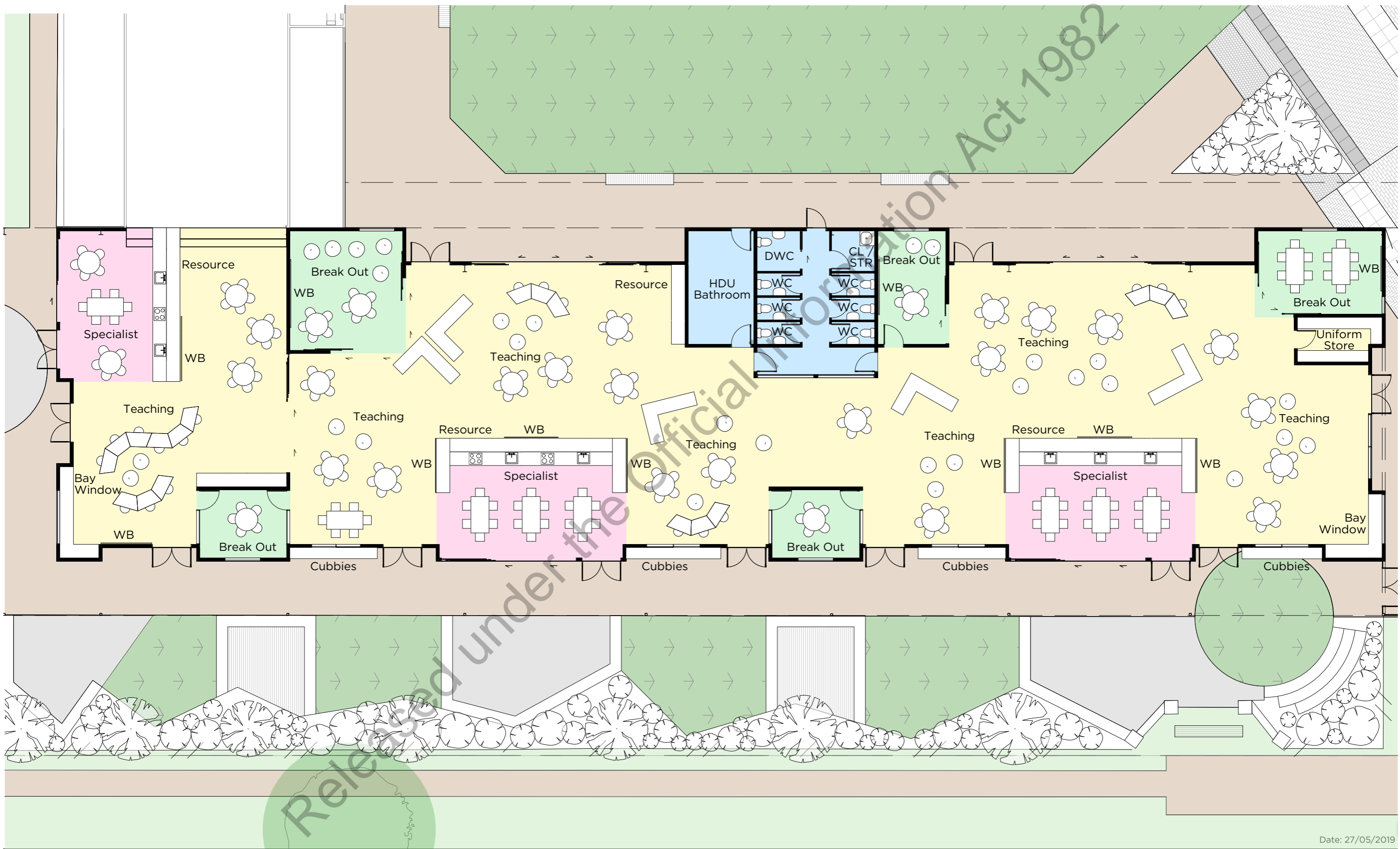
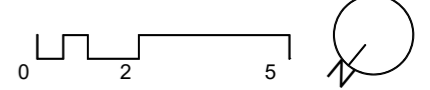


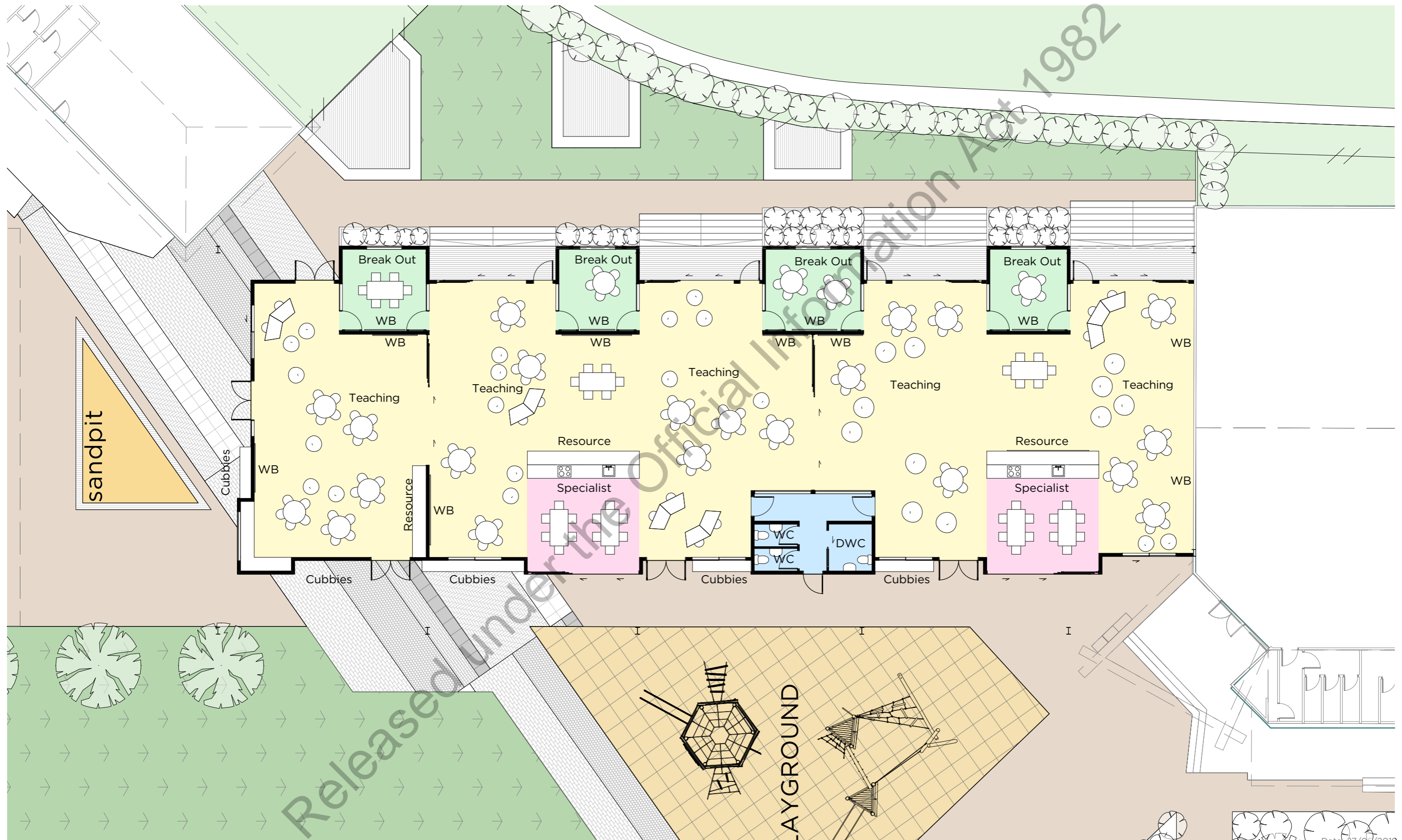
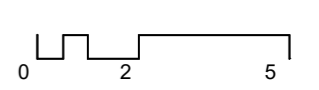


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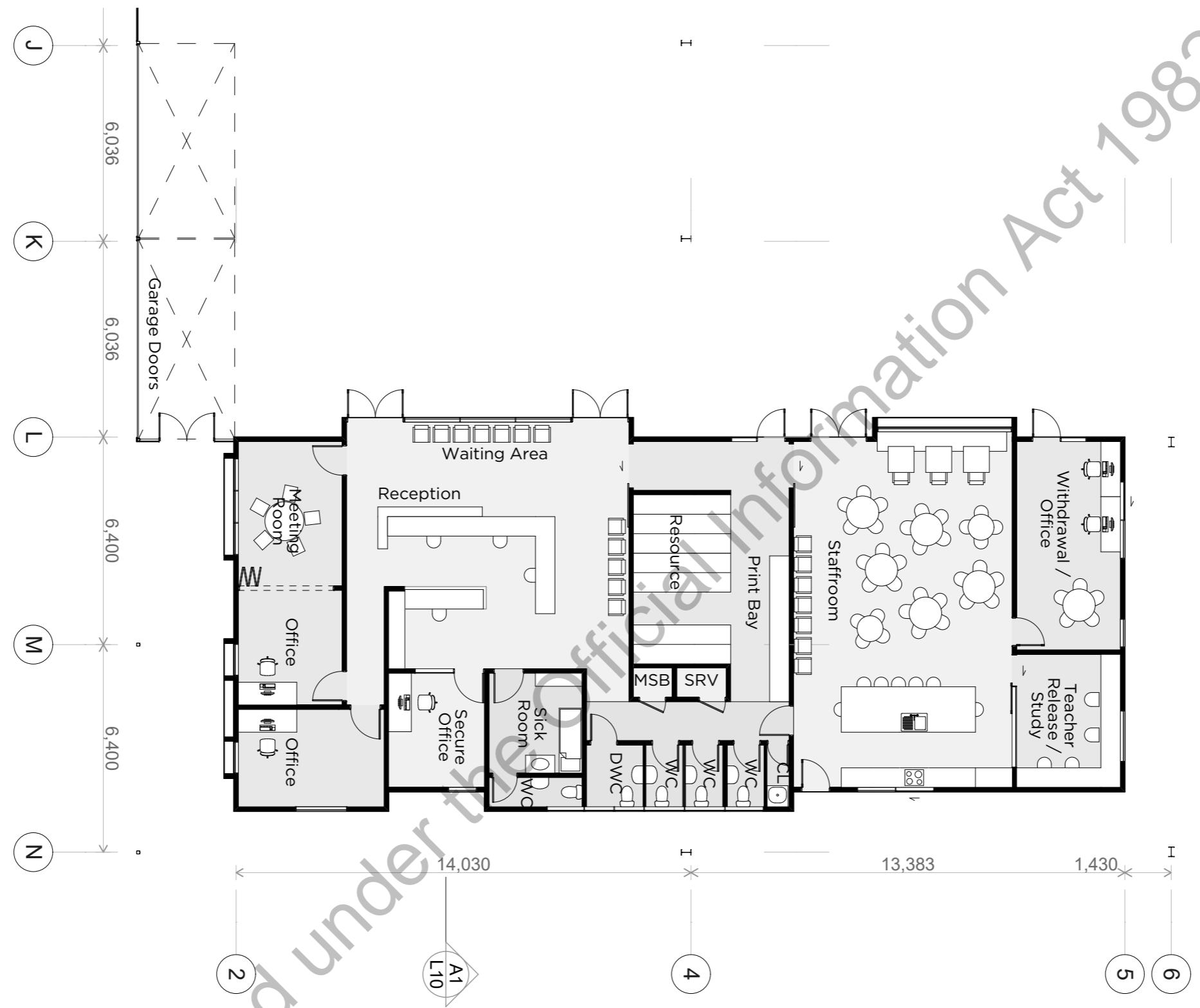
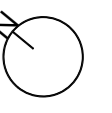
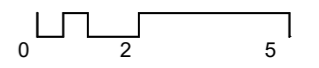






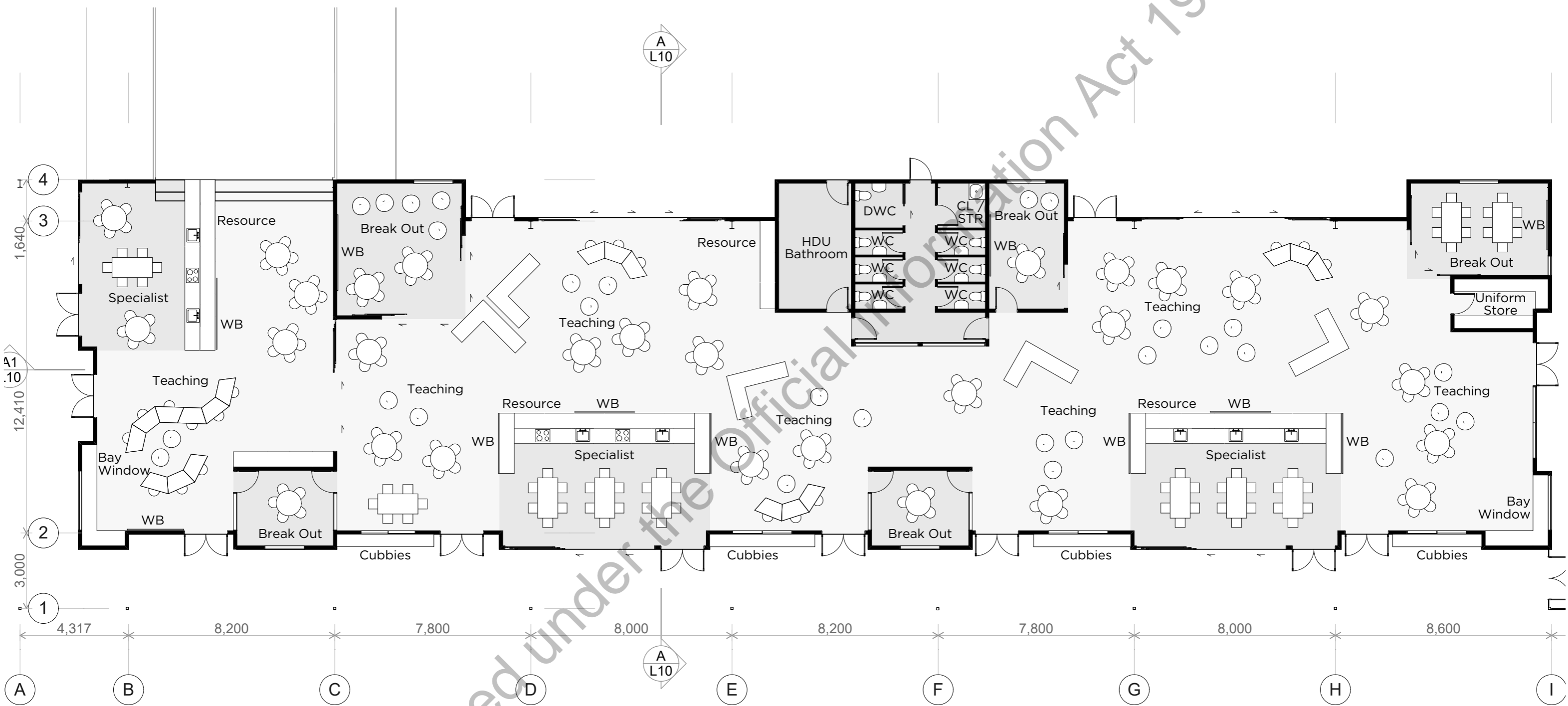
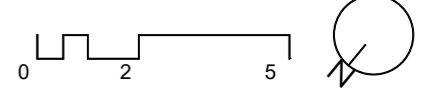
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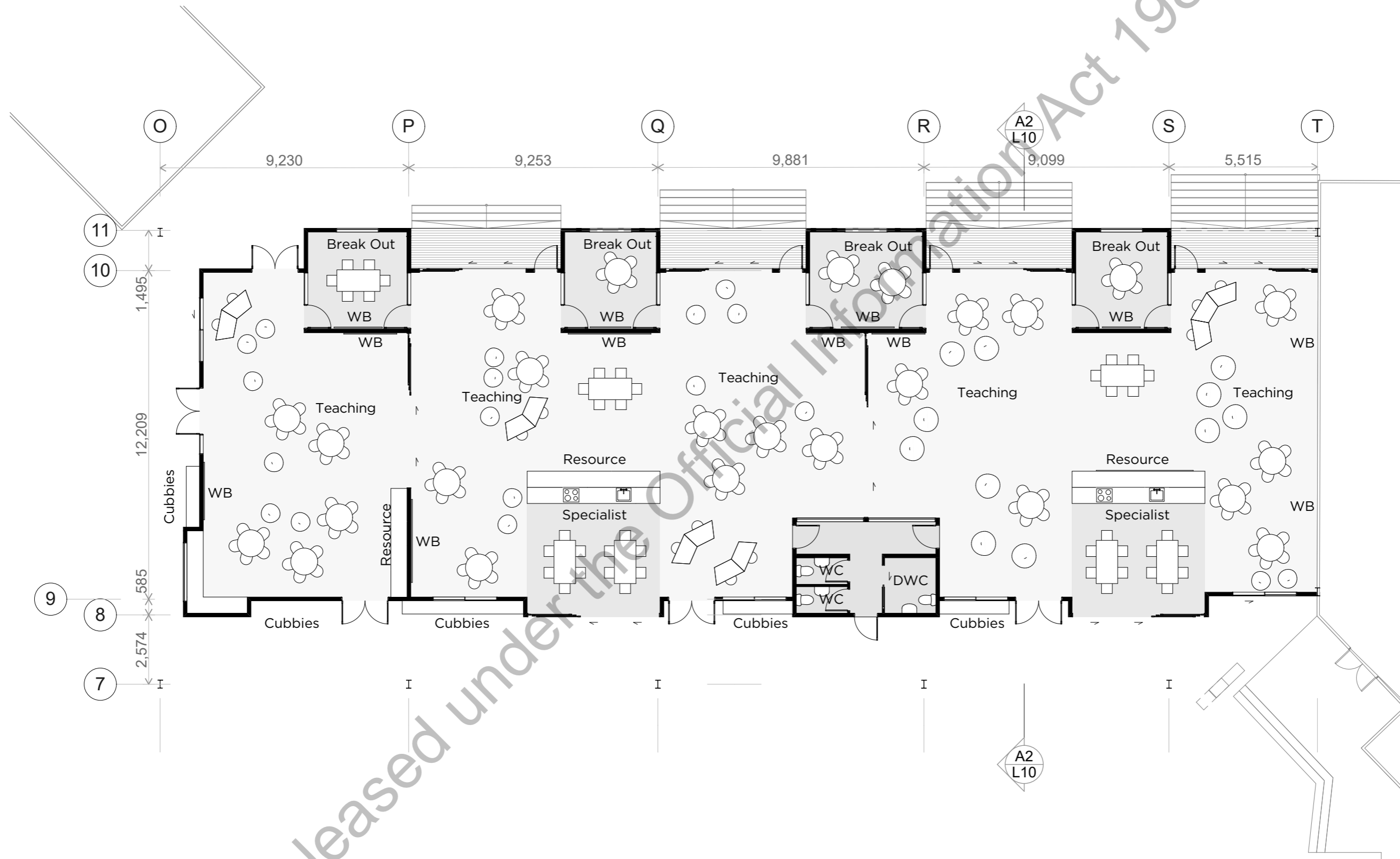
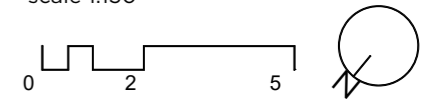
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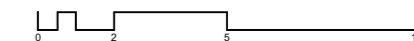
Released under the Official Information Act 1982





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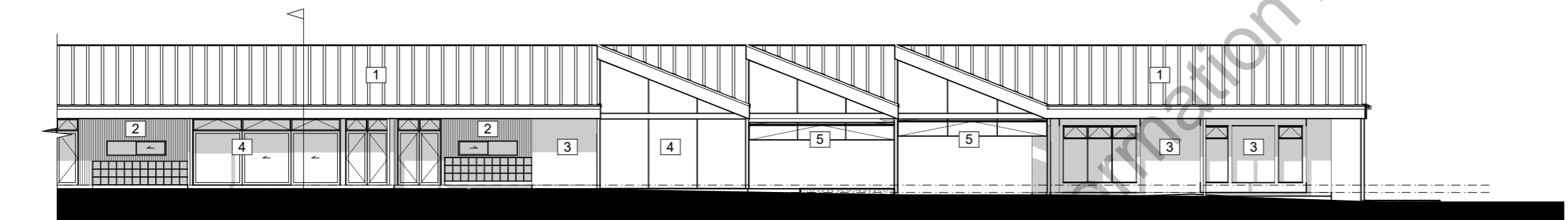




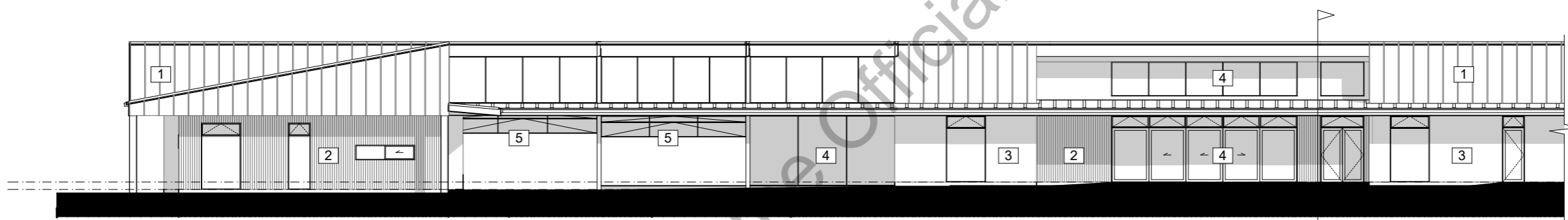
- 1 Kingspan KS1000 RW 60mm
- 2 Abodo Vulcan Cladding
- 3 JH Linea Oblique Random Width
- 4 APL Metro Series Joinery
- 5 Glideaway Roller Doors



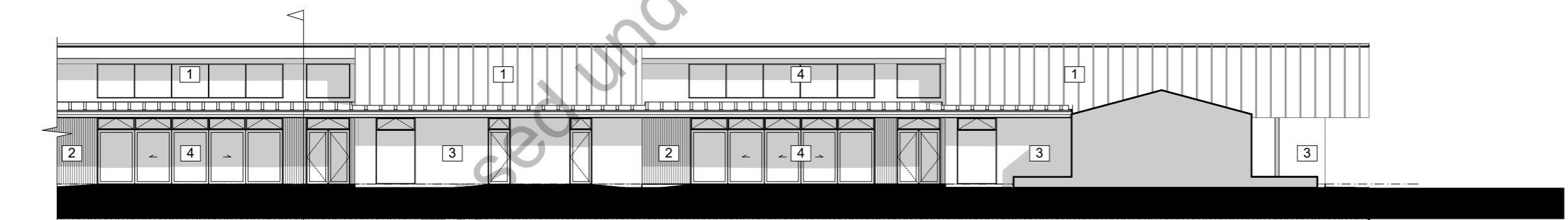
**West Elevation Block 1,2**  
1:200



**West Elevation Block 1,2**  
1:200



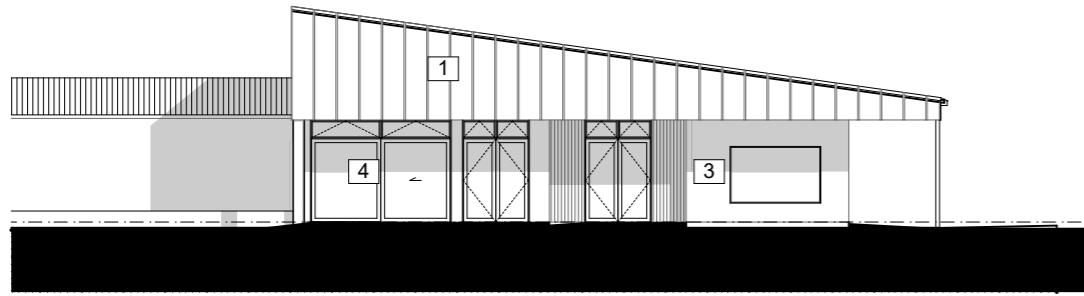
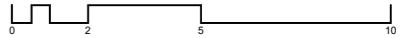
**East Elevation Block 1,2**  
1:200



**East Elevation Block 1,2**  
1:200

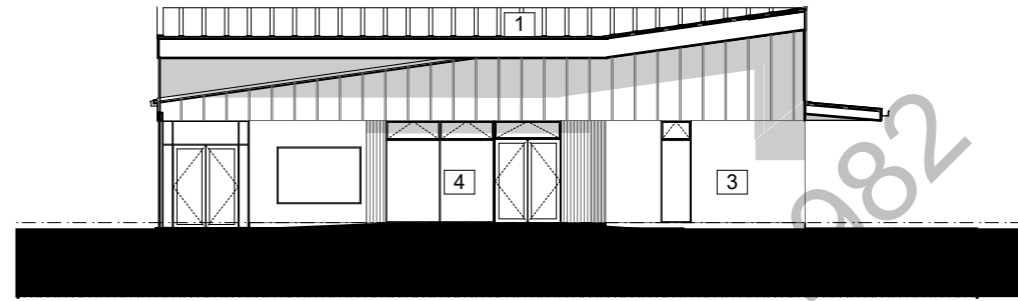
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North Elevation Block 2

1:200



South Elevation Block 2

1:200

- 1 Kingspan KS1000 RW 60mm
- 2 Abodo Vulcan Cladding
- 3 JH Linea Oblique Random Width
- 4 APL Metro Series Joinery
- 5 Glideaway Roller Doors



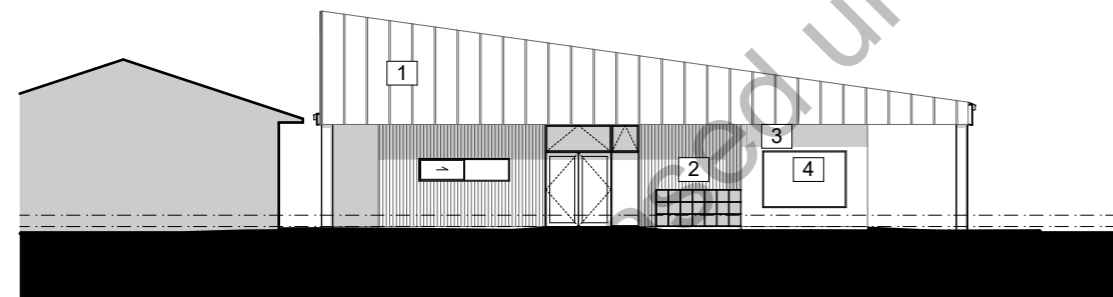
West Elevation Block 3 Elevation

1:200



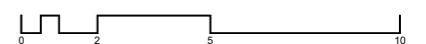
East Elevation Block 3 Elevation

1:200

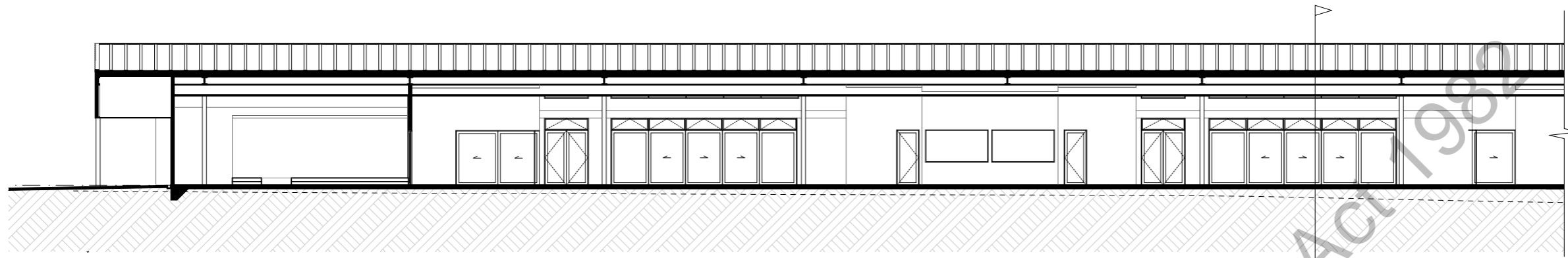


North Elevation Block 3 Elevation

1:200

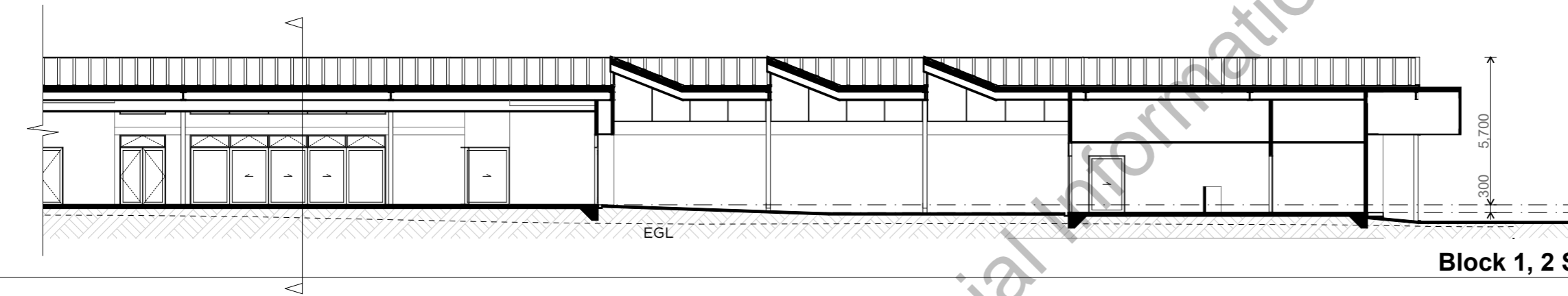






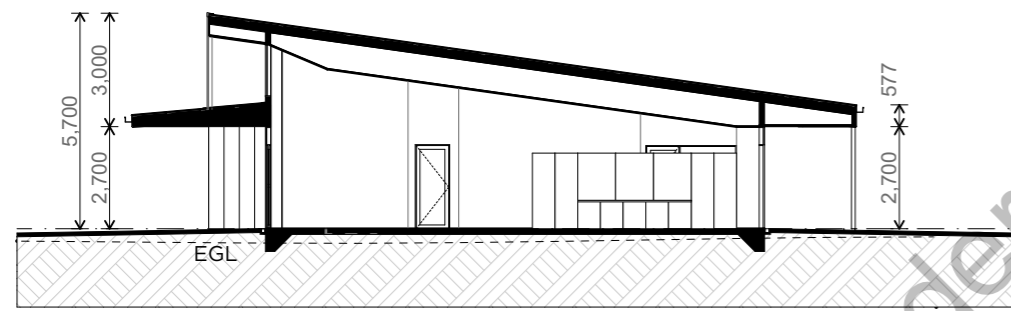
**Block 1, 2 Section**

1:200



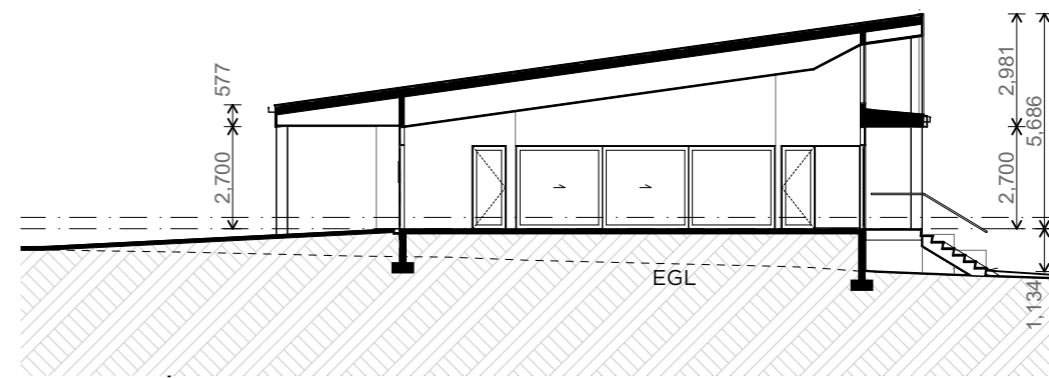
**Block 1, 2 Section**

1:200



**Block 2 Section**

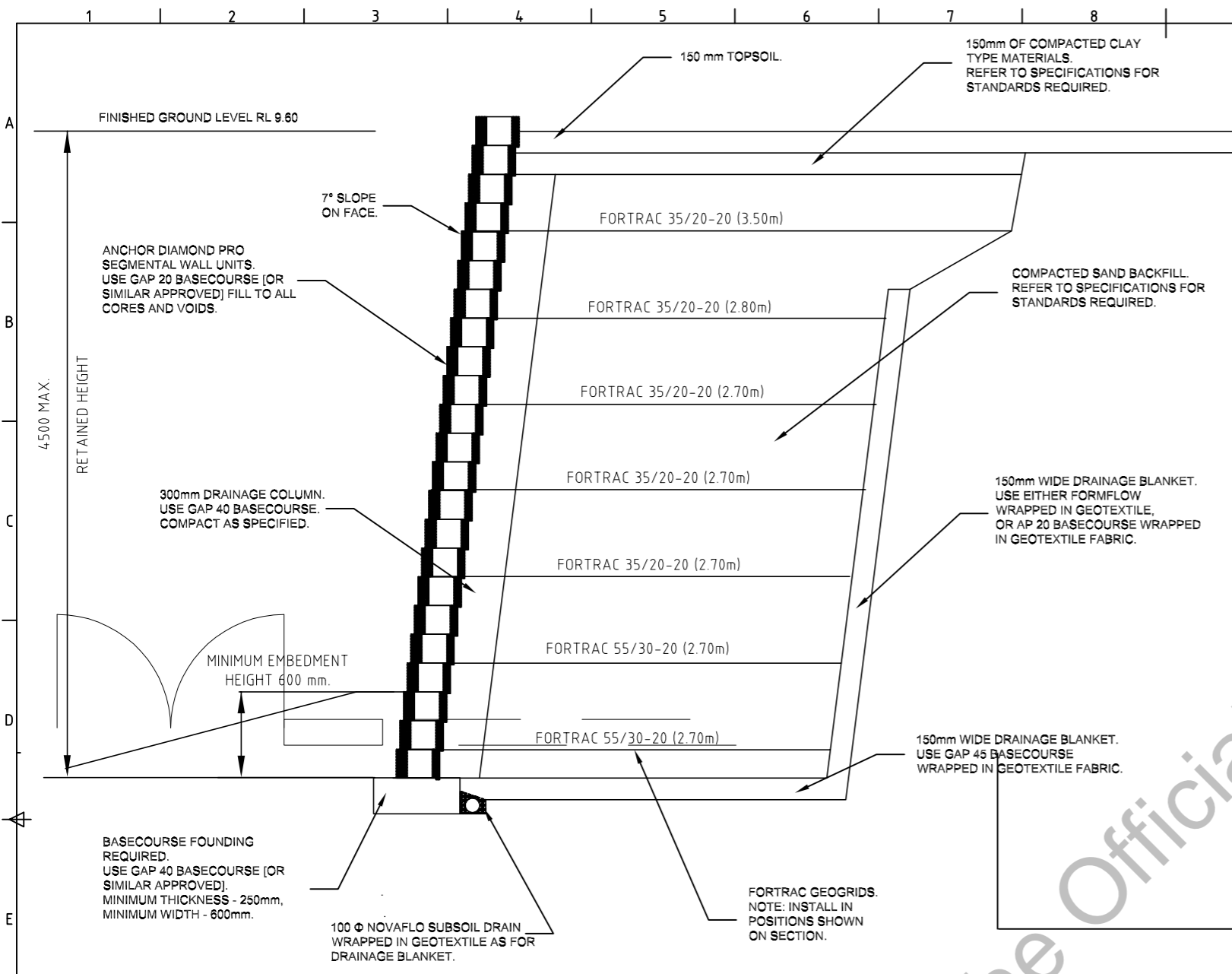
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**Block 3 Section**

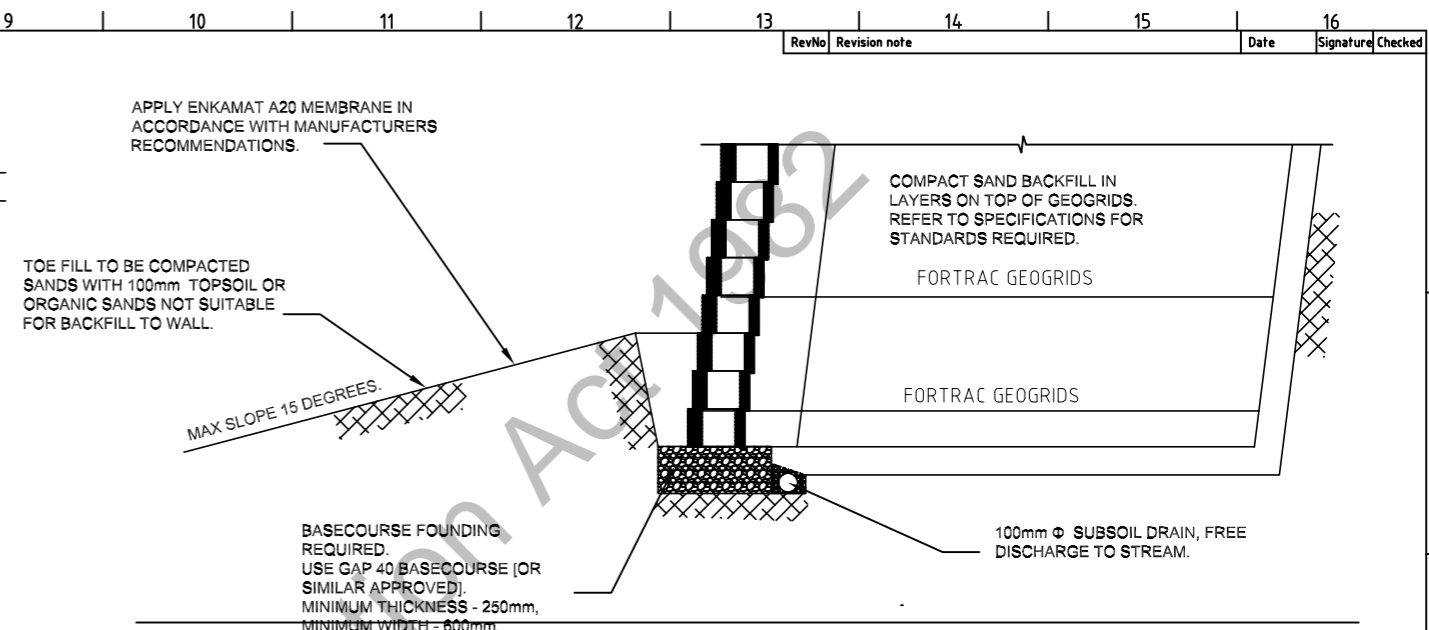
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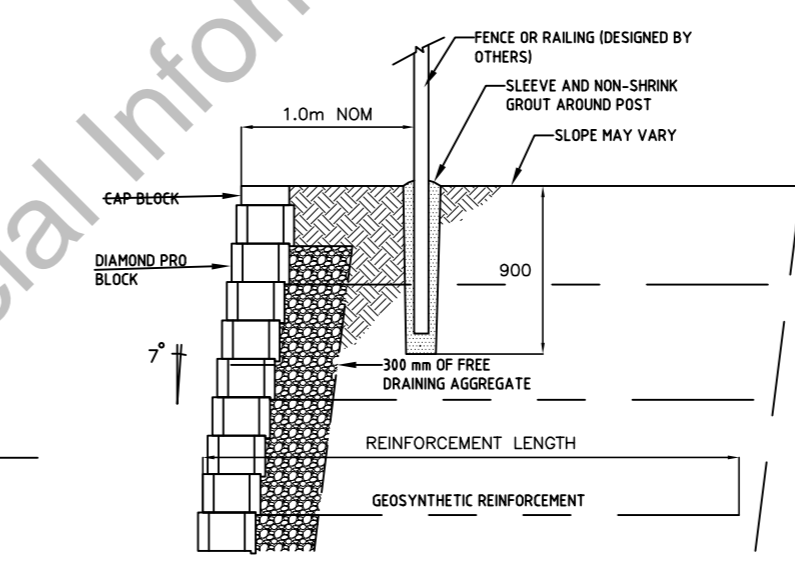


**SECTION 2**  
1:20 [A1] ST01

**TYPICAL SECTION - SEGMENTAL BLOCK RETAINING WALL**  
EXPOSED HEIGHT 3.80m - NO BUILDINGS ABOVE  
SCALE = 1:20



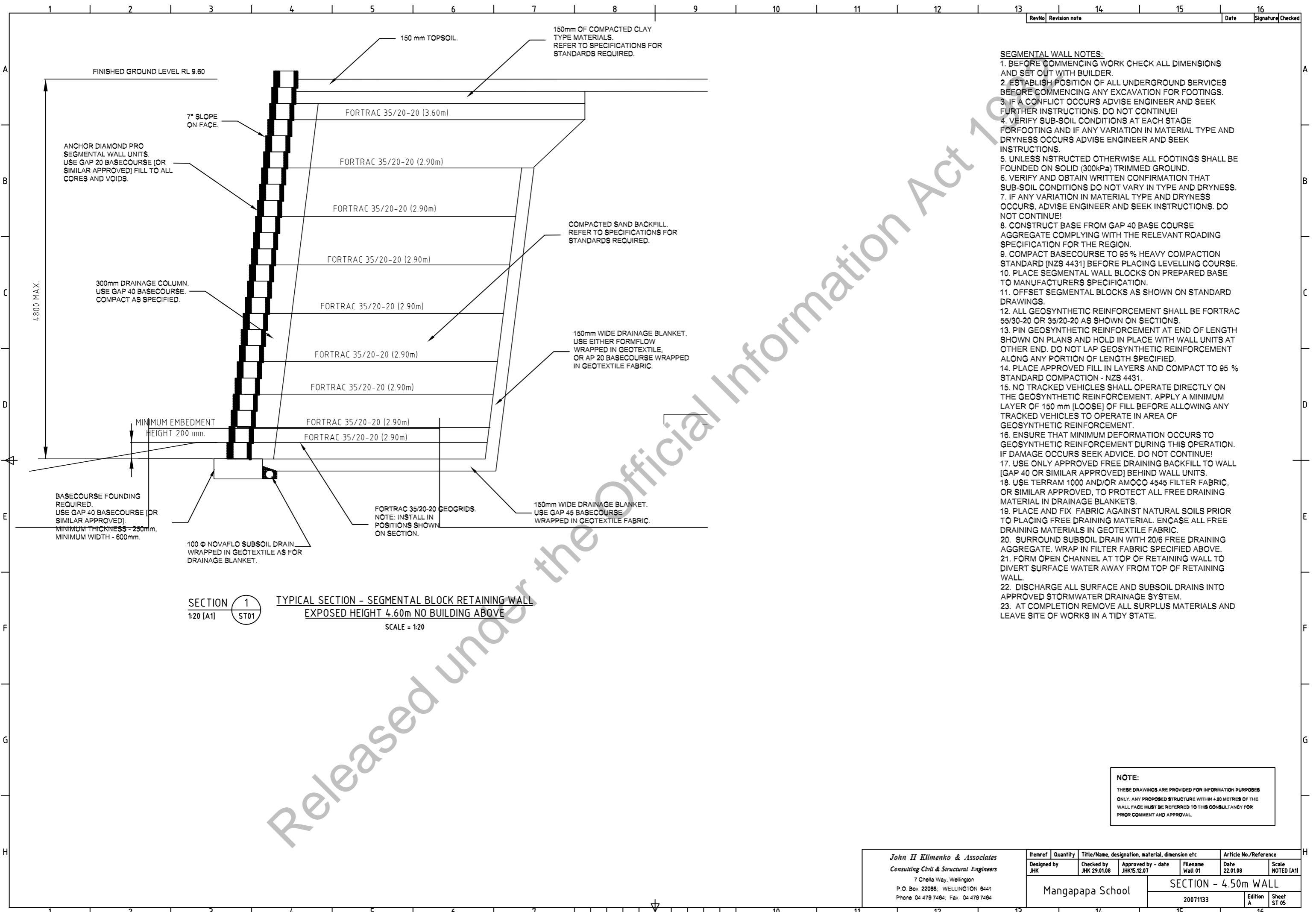
**TYPICAL SECTION - TOE PROTECTION AT BASE OF RETAINING WALL**  
SCALE = 1:20



**DIAMOND PRO TYPICAL DETAIL**  
FENCE BEHIND WALL  
1:20 [A1]  
[ANCHOR WALLS DETAIL]

**NOTE:**  
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<b>John H Klimenko &amp; Associates</b> Consulting Civil & Structural Engineers 7 Chella Way, Wellington P.O. Box 22088; WELLINGTON 6441 Phone 04 479 7484; Fax: 04 479 7484		Itemref Designed by JHK	Quantity Checked by JHK	Title/Name, designation, material, dimension etc Approved by - date JHK 15.12.07	Article No./Reference Filename Wall 01	Date 22.01.08	Scale NOTED [A1]	
<b>Mangapapa School</b>						20071133	Edition A	Sheet ST 06



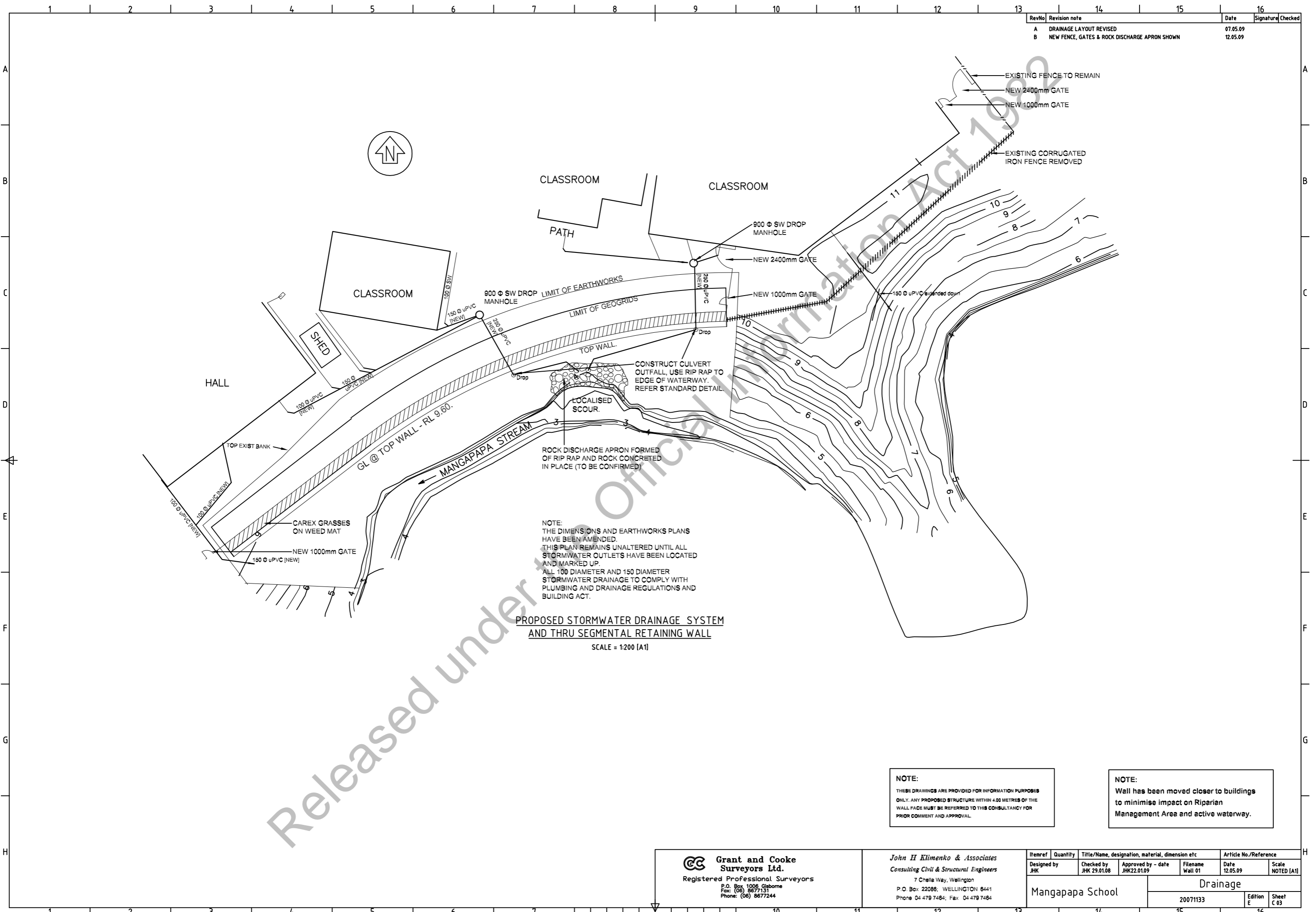
- SEGMENTAL WALL NOTES:**
- BEFORE COMMENCING WORK CHECK ALL DIMENSIONS AND SET OUT WITH BUILDER.
  - ESTABLISH POSITION OF ALL UNDERGROUND SERVICES BEFORE COMMENCING ANY EXCAVATION FOR FOOTINGS.
  - IF A CONFLICT OCCURS ADVISE ENGINEER AND SEEK FURTHER INSTRUCTIONS. DO NOT CONTINUE!
  - VERIFY SUB-SOIL CONDITIONS AT EACH STAGE FOR FOOTING AND IF ANY VARIATION IN MATERIAL TYPE AND DRYNESS OCCURS ADVISE ENGINEER AND SEEK INSTRUCTIONS.
  - UNLESS INSTRUCTED OTHERWISE ALL FOOTINGS SHALL BE FOUNDED ON SOLID (300kPa) TRIMMED GROUND.
  - VERIFY AND OBTAIN WRITTEN CONFIRMATION THAT SUB-SOIL CONDITIONS DO NOT VARY IN TYPE AND DRYNESS.
  - IF ANY VARIATION IN MATERIAL TYPE AND DRYNESS OCCURS, ADVISE ENGINEER AND SEEK INSTRUCTIONS. DO NOT CONTINUE!
  - CONSTRUCT BASE FROM GAP 40 BASE COURSE AGGREGATE COMPLYING WITH THE RELEVANT ROADING SPECIFICATION FOR THE REGION.
  - COMPACT BASECOURSE TO 95 % HEAVY COMPACTION STANDARD [NZS 4431] BEFORE PLACING LEVELLING COURSE.
  - PLACE SEGMENTAL WALL BLOCKS ON PREPARED BASE TO MANUFACTURERS SPECIFICATION.
  - OFFSET SEGMENTAL BLOCKS AS SHOWN ON STANDARD DRAWINGS.
  - ALL GEOSYNTHETIC REINFORCEMENT SHALL BE FORTRAC 55/30-20 OR 35/20-20 AS SHOWN ON SECTIONS.
  - PIN GEOSYNTHETIC REINFORCEMENT AT END OF LENGTH SHOWN ON PLANS AND HOLD IN PLACE WITH WALL UNITS AT OTHER END. DO NOT LAP GEOSYNTHETIC REINFORCEMENT ALONG ANY PORTION OF LENGTH SPECIFIED.
  - PLACE APPROVED FILL IN LAYERS AND COMPACT TO 95 % STANDARD COMPACTION - NZS 4431.
  - NO TRACKED VEHICLES SHALL OPERATE DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. APPLY A MINIMUM LAYER OF 150 mm [LOOSE] OF FILL BEFORE ALLOWING ANY TRACKED VEHICLES TO OPERATE IN AREA OF GEOSYNTHETIC REINFORCEMENT.
  - ENSURE THAT MINIMUM DEFORMATION OCCURS TO GEOSYNTHETIC REINFORCEMENT DURING THIS OPERATION. IF DAMAGE OCCURS SEEK ADVICE. DO NOT CONTINUE!
  - USE ONLY APPROVED FREE DRAINING BACKFILL TO WALL [GAP 40 OR SIMILAR APPROVED] BEHIND WALL UNITS.
  - USE TERRAM 1000 AND/OR AMOCO 4545 FILTER FABRIC, OR SIMILAR APPROVED, TO PROTECT ALL FREE DRAINING MATERIAL IN DRAINAGE BLANKETS.
  - PLACE AND FIX FABRIC AGAINST NATURAL SOILS PRIOR TO PLACING FREE DRAINING MATERIAL. ENCASE ALL FREE DRAINING MATERIALS IN GEOTEXTILE FABRIC.
  - SURROUND SUBSOIL DRAIN WITH 20/6 FREE DRAINING AGGREGATE. WRAP IN FILTER FABRIC SPECIFIED ABOVE.
  - FORM OPEN CHANNEL AT TOP OF RETAINING WALL TO DIVERT SURFACE WATER AWAY FROM TOP OF RETAINING WALL.
  - DISCHARGE ALL SURFACE AND SUBSOIL DRAINS INTO APPROVED STORMWATER DRAINAGE SYSTEM.
  - AT COMPLETION REMOVE ALL SURPLUS MATERIALS AND LEAVE SITE OF WORKS IN A TIDY STATE.

SECTION 1 ST01  
 1:20 [A1]  
 TYPICAL SECTION - SEGMENTAL BLOCK RETAINING WALL  
 EXPOSED HEIGHT 4.60m NO BUILDING ABOVE  
 SCALE = 1:20

**NOTE:**  
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<b>John H Klimenko &amp; Associates</b> Consulting Civil & Structural Engineers 7 Chella Way, Wellington P.O. Box 22088; WELLINGTON 6441 Phone 04 479 7484; Fax 04 479 7484		Itemref Designed by JHK	Quantity Checked by JHK 29.01.08	Title/Name, designation, material, dimension etc Approved by - date JHK 15.12.07	Article No./Reference Filename Wall 01	Date 22.01.08	Scale NOTED [A1]	
Mangapapa School				SECTION - 4.50m WALL		20071133	Edition A	Sheet ST 05

RevNo	Revision note	Date	Signature	Checked
A	DRAINAGE LAYOUT REVISED	07.05.09		
B	NEW FENCE, GATES & ROCK DISCHARGE APRON SHOWN	12.05.09		



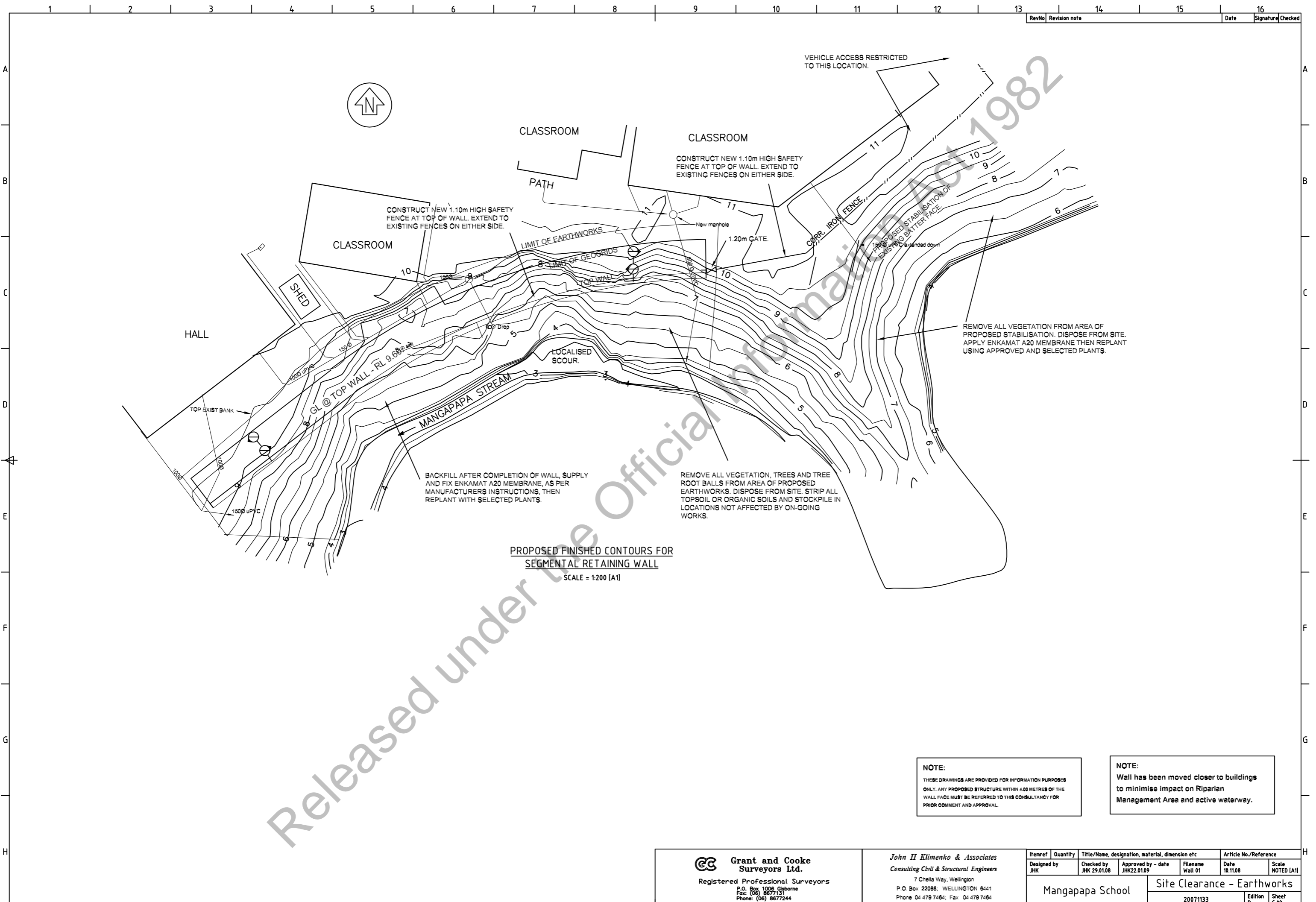
**PROPOSED STORMWATER DRAINAGE SYSTEM AND THRU SEGMENTAL RETAINING WALL**  
SCALE = 1:200 [A1]

NOTE:  
THE DIMENSIONS AND EARTHWORKS PLANS HAVE BEEN AMENDED.  
THIS PLAN REMAINS UNALTERED UNTIL ALL STORMWATER OUTLETS HAVE BEEN LOCATED AND MARKED UP.  
ALL 100 DIAMETER AND 150 DIAMETER STORMWATER DRAINAGE TO COMPLY WITH PLUMBING AND DRAINAGE REGULATIONS AND BUILDING ACT.

NOTE:  
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NOTE:  
Wall has been moved closer to buildings to minimise impact on Riparian Management Area and active waterway.

<b>Grant and Cooke Surveyors Ltd.</b> Registered Professional Surveyors P.O. Box 1006, Gisborne Fax: (06) 8677131 Phone: (06) 8677244	<b>John H Klimenko &amp; Associates</b> Consulting Civil & Structural Engineers 7 Chella Way, Wellington P.O. Box 22088, WELLINGTON 6441 Phone 04 479 7484; Fax: 04 479 7484		Itemref Designed by JHK	Quantity Checked by JHK	Title/Name, designation, material, dimension etc Approved by - date JHK22.01.09	Article No./Reference Filename Wall 01	Date 12.05.09	Scale NOTED [A1]
	Mangapapa School		Drainage		20071133	Edition E	Sheet C 03	
					15	16		



**PROPOSED FINISHED CONTOURS FOR  
SEGMENTAL RETAINING WALL**  
SCALE = 1:200 (A1)

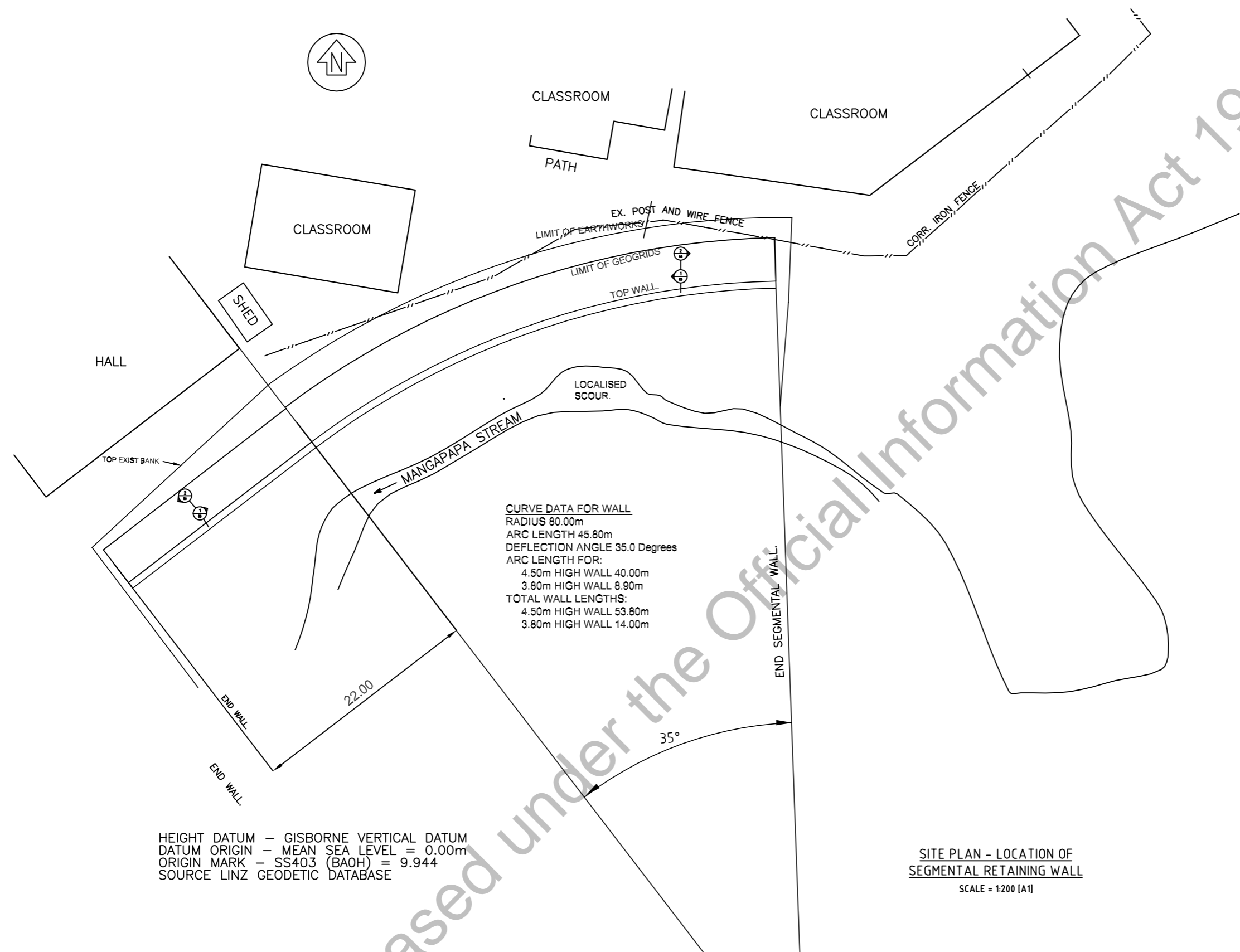
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**NOTE:**  
Wall has been moved closer to buildings to minimise impact on Riparian Management Area and active waterway.

<b>Grant and Cooke</b> <b>Surveyors Ltd.</b> Registered Professional Surveyors P.O. Box 1006, Gisborne Fax: (06) 8677131 Phone: (06) 8677244	<b>John H Klimenko &amp; Associates</b> Consulting Civil & Structural Engineers 7 Chella Way, Wellington P.O. Box 22088, WELLINGTON 6441 Phone 04 479 7484; Fax: 04 479 7484		Itemref	Quantity	Title/Name, designation, material, dimension etc		Article No./Reference	
	Designed by	JHK	Checked by	JHK 29.01.08	Approved by - date	JHK 22.01.09	Filename	Wall 01
	Mangapapa School		Site Clearance - Earthworks		Date	10.11.08	Scale	NOTED (A1)
				20071133		Edition	D	
						Sheet	C 02	

- EARTHWORKS NOTES:**
- BEFORE COMMENCING WORK CHECK ALL DIMENSIONS AND SET OUT WITH BUILDER.
  - ESTABLISH POSITION OF ALL UNDERGROUND SERVICES BEFORE COMMENCING ANY EXCAVATION FOR FOOTINGS.
  - IF A CONFLICT OCCURS ADVISE ENGINEER AND SEEK FURTHER INSTRUCTIONS. DO NOT CONTINUE!
  - REMOVE ALL VEGETATION IN AREA OF PROPOSED WORKS, INCLUDING TREES AND THEIR ROOT BALLS.
  - STRIP TOPSOIL OR ORGANIC MATERIALS TYPICAL OF TOPSOIL AND STOCKPILE WHERE PRACTICAL, DO NOT DOUBLE HANDLE MATERIALS.
  - EXCAVATE AND STOCKPILE SUITABLE MATERIALS FOR BACKFILL. DO NOT DOUBLE HANDLE!
  - STAGE CONSTRUCTION OF WALL SO AS TO MINIMISE AREAS DISRUPTED.
  - ACCESS IS RESTRICTED SO VEHICLES DELIVERING MATERIALS MUST OPERATE IN WELL DEFINED CORRIDORS ONLY. SAFETY OF ALL OCCUPANTS AND WORKERS IS PARAMOUNT.
  - REFER TO OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS AS WELLAS MINISTRY OF EDUCATION SAFE REQUIREMENTS. COMPLY TOTALLY!
  - APPLY 150 mm [MINIMUM] TOPSOIL OVER IMPERMEABLE BLANKET SHOWN.
  - FORM OPEN CHANNEL AT TOP OF RETAINING WALL TO DIVERT SURFACE WATER AWAY FROM TOP OF RETAINING WALL.
  - DISCHARGE ALL SURFACE AND SUBSOIL DRAINS INTO APPROVED STORMWATER DRAINAGE SYSTEM.
  - AT COMPLETION REMOVE ALL SURPLUS MATERIALS AND LEAVE SITE OF WORKS IN A TIDY STATE.



**CURVE DATA FOR WALL**  
 RADIUS 80.00m  
 ARC LENGTH 45.80m  
 DEFLECTION ANGLE 35.0 Degrees  
 ARC LENGTH FOR:  
 4.50m HIGH WALL 40.00m  
 3.80m HIGH WALL 8.90m  
**TOTAL WALL LENGTHS:**  
 4.50m HIGH WALL 53.80m  
 3.80m HIGH WALL 14.00m

HEIGHT DATUM - GISBORNE VERTICAL DATUM  
 DATUM ORIGIN - MEAN SEA LEVEL = 0.00m  
 ORIGIN MARK - SS403 (BAOH) = 9.944  
 SOURCE LINZ GEODETIC DATABASE

**SITE PLAN - LOCATION OF SEGMENTAL RETAINING WALL**  
 SCALE = 1:200 [A1]

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 THESE DRAWINGS ARE PROVIDED FOR INFORMATION PURPOSES ONLY. ANY PROPOSED STRUCTURE WITHIN 4.00 METRES OF THE WALL FACE MUST BE REFERRED TO THIS CONSULTANCY FOR PRIOR COMMENT AND APPROVAL.

**NOTE:**  
 Wall details and dimensions have been amended. Refer to sheet ST 02.

**NOTE:**  
 Wall has been moved closer to buildings to minimise impact on Riparian Management Area and active waterway.

**Grant and Cooke Surveyors Ltd.**  
 Registered Professional Surveyors  
 P.O. Box 1008, Gisborne  
 Fax: (06) 8671131  
 Phone: (06) 8677244

**John H Klimenko & Associates**  
 Consulting Civil & Structural Engineers  
 7 Chella Way, Wellington  
 P.O. Box 22086, WELLINGTON 8441  
 Phone 04 479 7484; Fax 04 479 7484

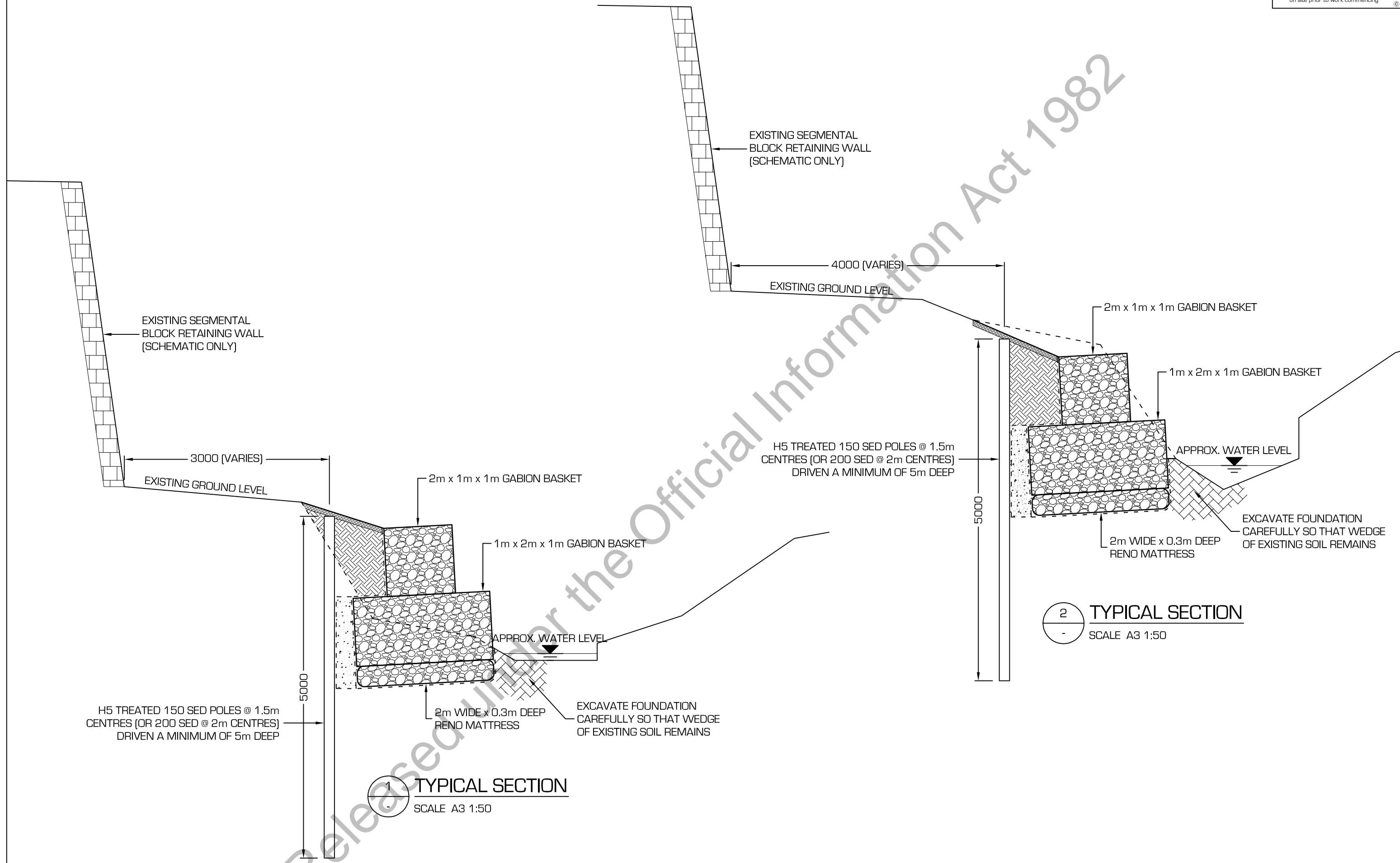
Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference
Designed by JHK	Checked by JHK 29.01.08	Approved by - date JHK21.01.09	Filename Wall 01	Date 10.11.08	Scale NOTED [A1]
Mangapapa School				20071133	Edition C
					Sheet ST 01

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CONSTRUCTION DRAWINGS FOR  
STREAM EROSION PROTECTION & SLOPE STABILISATION  
MANGAPAPA SCHOOL, 5 RUA STREET, GISBORNE  
FOR THE MANGAPAPA SCHOOL BOARD OF TRUSTEES

CONTENTS				
SHEET	DESCRIPTION	ISSUE DATE	STATUS	REVISION
1	TYPICAL CROSS SECTIONS	14/03/12	CONSENT	0
2	CROSS SECTION DETAILS	14/03/12	CONSENT	0
3	HALF ELEVATION	14/03/12	CONSENT	0
4	HALF PLANS	14/03/12	CONSENT	0

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CLIENT  
 MANGAPAPA SCHOOL BOARD OF TRUSTEES  
 C/- INSIGHT UNLIMITED, PO BOX 1219  
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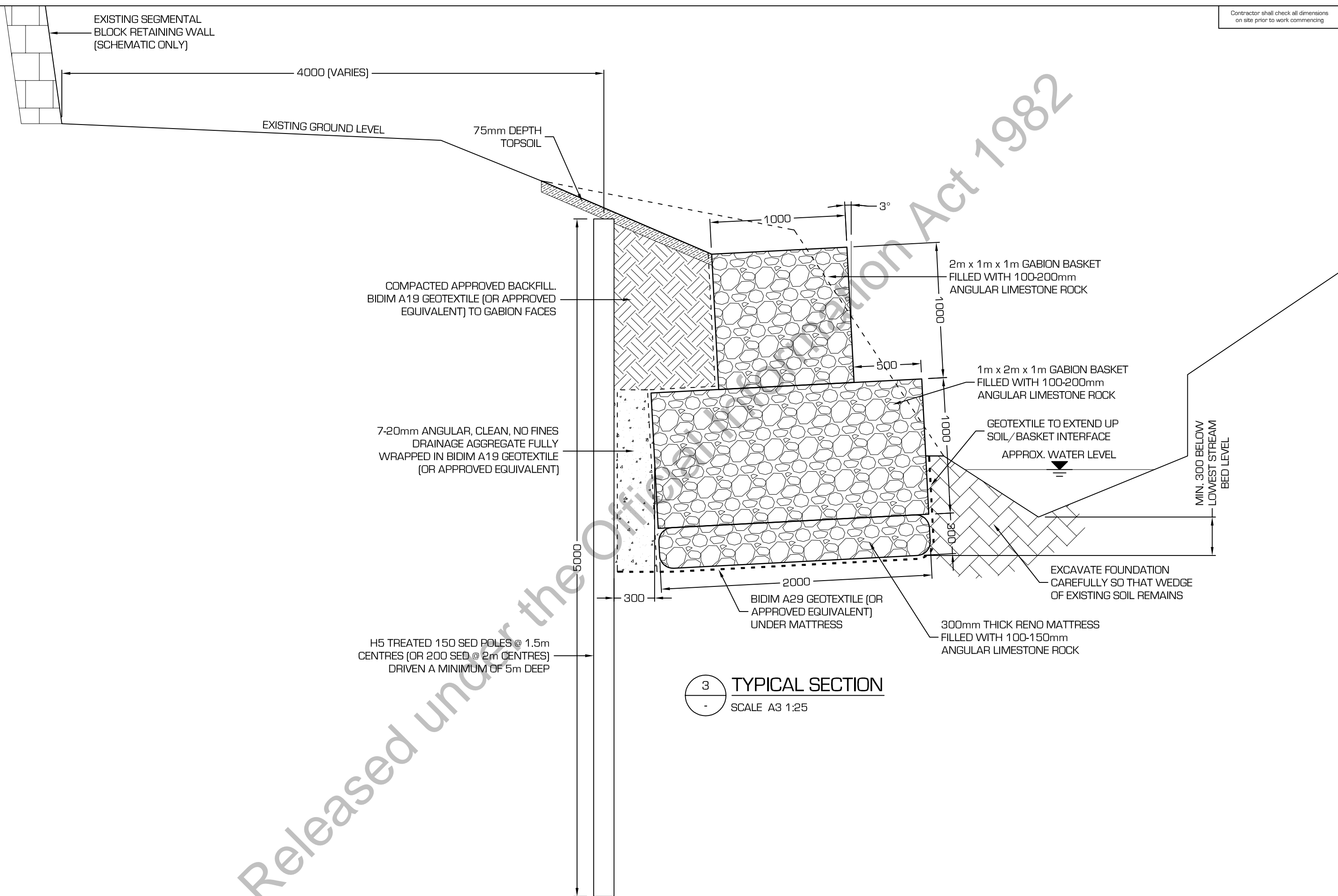
PROJECT  
 STREAM BANK STABILISATION  
 MANGAPAPA SCHOOL, 5 RUA STREET  
 GISBORNE

DRAWING TITLE  
 TYPICAL CROSS SECTIONS



DESIGN:	AA/GW	PROJECT STATUS:	CONSENT	
DRAWN:	ASA	PROJECT:	10251	1 of 4
DATE:	14.03.12	CHECKED:	GEW	0
SCALE A3:	SHOWN	DRAWING NO.:	10251-01	REV:
No.	REVISION	BY	DATE	





3 TYPICAL SECTION  
SCALE A3 1:25

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GISBORNE

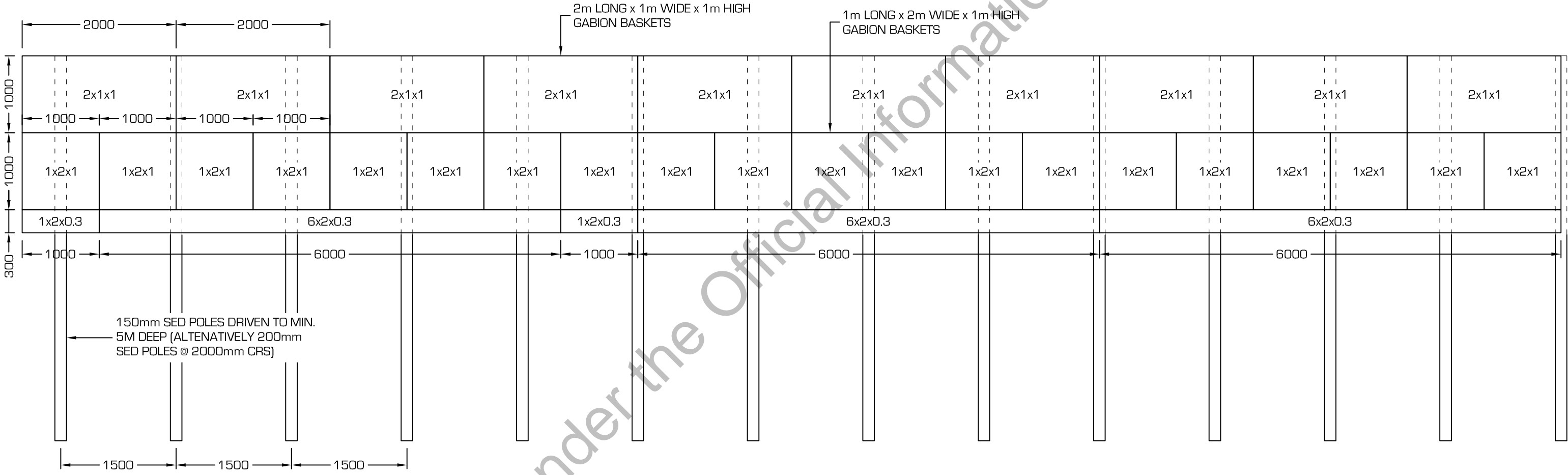
PROJECT  
STREAM BANK STABILISATION  
MANGAPAPA SCHOOL, 5 RUA STREET  
GISBORNE

DRAWING TITLE  
CROSS SECTION DETAILS




DESIGNER	AA/GW
DRAWN	ASA
DATE	14.03.12
CHECKED	GEW
SCALE A3	SHOWN

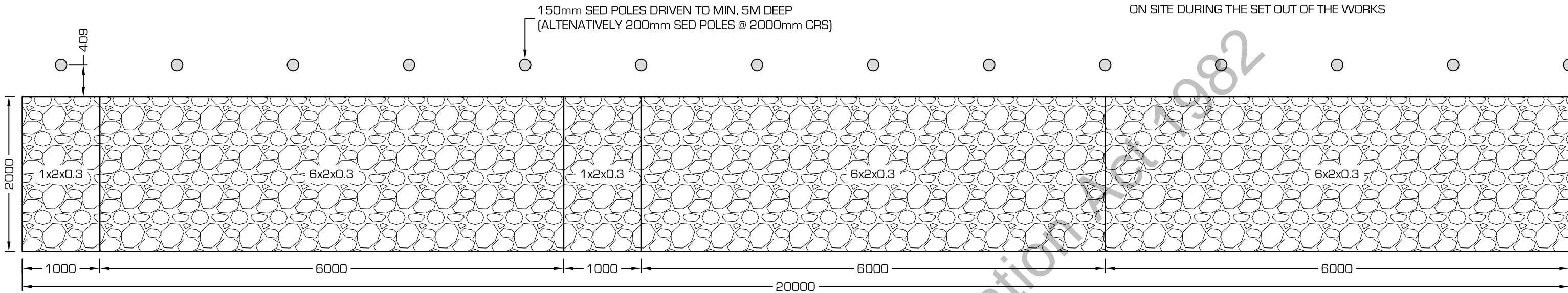
PROJECT STATUS	CONSENT	
PROJECT	10251	2 of 4
DRAWING NO.	10251-01	REV 0



1 HALF ELEVATION  
1 SCALE A3 1:50

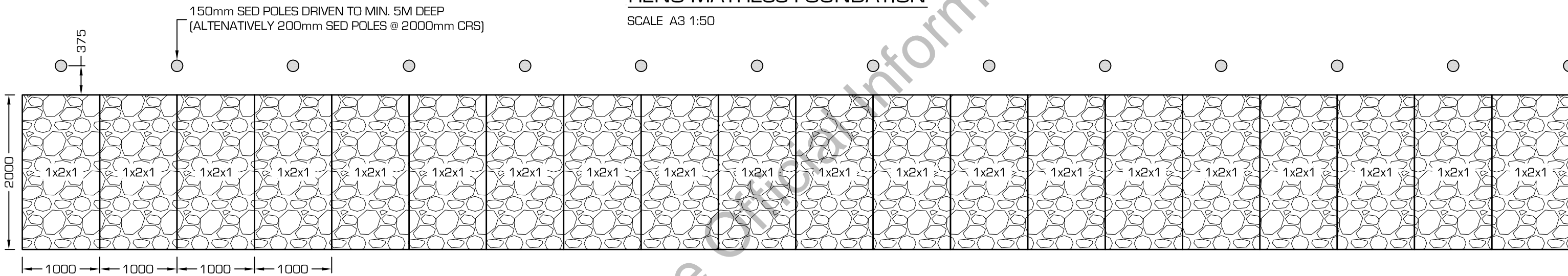
CLIENT MANGAPAPA SCHOOL BOARD OF TRUSTEES C/- INSIGHT UNLIMITED, PO BOX 1219 GISBORNE	PROJECT STREAM BANK STABILISATION MANGAPAPA SCHOOL, 5 RUA STREET GISBORNE	DRAWING TITLE HALF ELEVATION		DESIGN: AA/GW	PROJECT STATUS: CONSENT
				DRAWN: ASA	PROJECT: 10251
				DATE: 14.03.12	SHEET: 3 of 4
				CHECKED: GEW	DRAWING NO: 10251-01
				SCALE A3: SHOWN	REV: 0
				No. REVISION	BY DATE

**NOTE:**  
THE WALL ALIGNMENT IN PLAN IS NOT STRAIGHT,  
THE ACTUAL ALIGNMENT WILL BE DETERMINED  
ON SITE DURING THE SET OUT OF THE WORKS



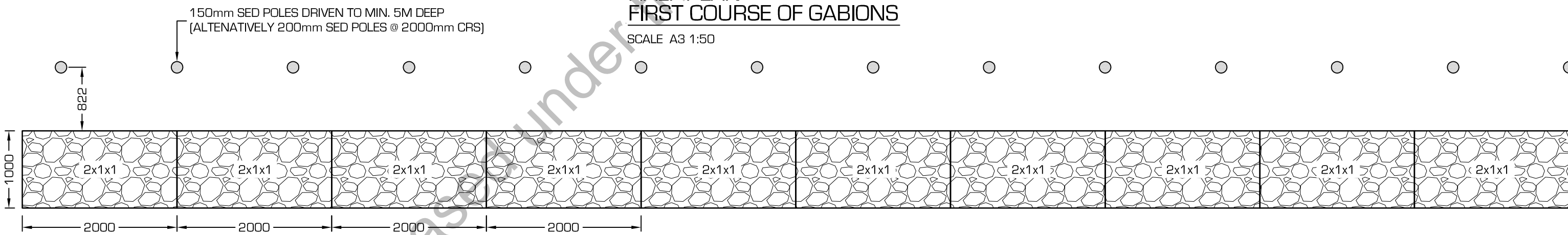
**HALF PLAN  
RENO MATRESS FOUNDATION**

SCALE A3 1:50



**HALF PLAN  
FIRST COURSE OF GABIONS**

SCALE A3 1:50



**HALF PLAN  
SECOND COURSE OF GABIONS**

SCALE A3 1:50

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PROJECT  
STREAM BANK STABILISATION  
MANGAPAPA SCHOOL, 5 RUA STREET  
GISBORNE

DRAWING TITLE  
HALF PLANS



DESIGN: AA/GW	PROJECT STATUS: CONSENT
DRAWN: ASA	PROJECT: 10251
DATE: 14.03.12	SHEET: 4 of 4
CHECKED: GEW	DRAWING NO: 10251-01
SCALE A3: SHOWN	REV: 0



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