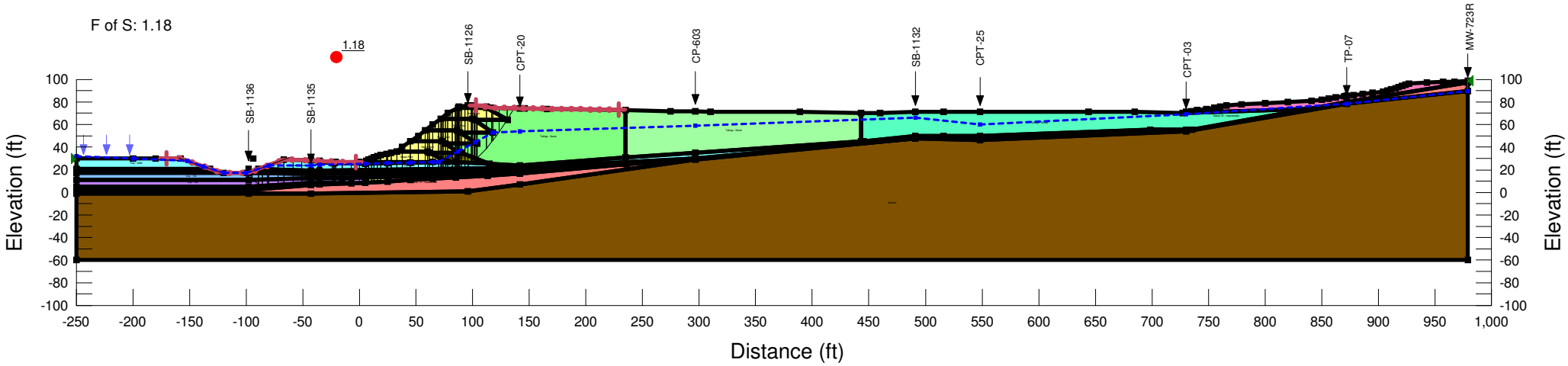
APPENDIX F
SHORT-TERM SLOPE STABILITY EVALUATION

Title: Callahan Mine OU3 - Profile S2
Date: 10/16/2014
File Name: Tailings_Profile S2_Temporary Drill Pad_90%.gsz

Name: Profile S2 - Drill-Pad-Cut - Till Imp
Method: Spencer

Name: Waste Rock Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 42 ° Constant Unit Wt. Above Water Table: 95 pcf Piezometric Line: 1
Name: Tailings - Sands Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 37 ° Constant Unit Wt. Above Water Table: 110 pcf Piezometric Line: 1
Name: Tailings - Mixed Model: Mohr-Coulomb Unit Weight: 117 pcf Cohesion': 0 psf Phi': 36 ° Constant Unit Wt. Above Water Table: 110 pcf Piezometric Line: 1
Name: Tailings - Slimes Model: Mohr-Coulomb Unit Weight: 114 pcf Cohesion': 0 psf Phi': 35 ° Constant Unit Wt. Above Water Table: 110 pcf Piezometric Line: 1
Name: Gravel Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 0 psf Phi': 38 ° Constant Unit Wt. Above Water Table: 125 pcf Piezometric Line: 1
Name: Fill - Rock/Sand/Fines Mix Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 25 psf Phi': 36 ° Constant Unit Wt. Above Water Table: 120 pcf Piezometric Line: 1
Name: Clay - 1250 Model: Undrained (Phi=0) Unit Weight: 122 pcf Cohesion': 1,250 psf Piezometric Line: 1
Name: Bedrock Model: Bedrock (Impenetrable) Piezometric Line: 1
Name: Reworked Clay/Till - Su Model: Undrained (Phi=0) Unit Weight: 125 pcf Cohesion': 2,000 psf Constant Unit Wt. Above Water Table: 120 pcf Piezometric Line: 1
Name: Clay - 750 Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 750 psf Piezometric Line: 1
Name: Clay - 500 Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 500 psf Piezometric Line: 1
Name: Glacial Till - Impenetrable Model: Bedrock (Impenetrable) Piezometric Line: 1
Name: Clay - 525 Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 525 psf Piezometric Line: 1
Name: Clay - 950 Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 950 psf Piezometric Line: 1
Name: Clay - 1175 Model: Undrained (Phi=0) Unit Weight: 122 pcf Cohesion': 1,175 psf Piezometric Line: 1
Name: Clay - 775 Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 775 psf Piezometric Line: 1
Name: Clay - 825 Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 825 psf Piezometric Line: 1
Name: Clay - 400 Model: Undrained (Phi=0) Unit Weight: 118 pcf Cohesion': 400 psf Piezometric Line: 1
Name: Clay - 1500 Model: Undrained (Phi=0) Unit Weight: 122 pcf Cohesion': 1,500 psf Piezometric Line: 1
Name: Clay - 2000 Model: Undrained (Phi=0) Unit Weight: 123 pcf Cohesion': 2,000 psf Piezometric Line: 1
Name: Clay - 600 Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 600 psf Piezometric Line: 1
Name: Clay - 1125 Model: Undrained (Phi=0) Unit Weight: 122 pcf Cohesion': 1,125 psf Piezometric Line: 1
Name: Clay - 975 Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 975 psf Piezometric Line: 1
Name: Clay - 1150 Model: Undrained (Phi=0) Unit Weight: 122 pcf Cohesion': 1,150 psf Piezometric Line: 1



390F L Hydraulic Excavator Specifications

Engine

Engine Model	Cat C18 ACERT	
Net Flywheel Power	391 kW	524 hp
Net Power – SAE J1349	391 kW	524 hp
Engine rpm		
Operation	1,700 rpm	
Travel	1,900 rpm	
Bore	145 mm	5.7 in
Stroke	183 mm	7.2 in
Displacement	18.1 L	1,104.5 in³

- The 390F L meets U.S. EPA Tier 4 Final emission standards.
- No engine power derating required below 2300 m (7,500 ft) altitude.
- Net power advertised is the power available at the flywheel when the engine is equipped with fan, air cleaner, muffler and alternator.
- Rating at 1,700 rpm (Implement).

Weights

Operating Weight	86 275 kg	190,204 lb

- Long Undercarriage, 8.4 m (27'7") GP Boom, R4.4 (14'5") Stick, 4.6 m³ (6.0 yd³) GD Bucket and 650 mm (26 in) Shoes.

Track

Standard with Long Undercarriage	900 mm	35 in
Optional for Long Undercarriage	750 mm	30 in
Optional for Long Undercarriage	650 mm	26 in
Number of Shoes Each Side – Long Undercarriage	51	
Number of Track Rollers Each Side – Long Undercarriage	9	
Number of Carrier Rollers Each Side	3	

Swing Mechanism

Swing Speed	6.2 rpm	
Swing Torque	260 kN·m	191,766 lbf-ft

Drive

Maximum Travel Speed	4.5 km/h	2.8 mph
Maximum Drawbar Pull – Long Undercarriage	590 kN	132,637 lbf

Service Refill Capacities

Fuel Tank Capacity	1240 L	328 gal
Cooling System	74 L	20 gal
Engine Oil	60 L	16 gal
Swing Drive (each)	19 L	5.0 gal
Final Drive (each)	21 L	5.5 gal
Hydraulic System (including tank)	997 L	263 gal
Hydraulic Tank	813 L	215 gal
DEF Tank	48 L	13 gal

Hydraulic System

Main System – Maximum Flow (total)		
Implement	952 L/min	266 gal/min
Travel	1064 L/min	281 gal/min
Main System – Maximum Flow (× 2 pumps)		
Implement	476 L/min	133 gal/min
Travel	532 L/min	141 gal/min
Swing System – Maximum Flow	No swing pump	
Maximum Pressure		
Equipment – Normal	35 000 kPa	5,076 psi
Travel	35 000 kPa	5,076 psi
Swing	35 000 kPa	5,076 psi
Pilot System		
Maximum Flow	67 L/min	17.7 gal/min
Maximum Pressure	4.0-4.4 MPa	580-638 psi
Boom Cylinder		
Bore	210 mm	8.3 in
Stroke	1967 mm	77 in
Stick Cylinder		
Bore	220 mm	8.7 in
Stroke	2262 mm	89 in
HB2 – Family Bucket Cylinder		
Bore	200 mm	7.9 in
Stroke	1451 mm	57 in
JC – Family Bucket Cylinder		
Bore	220 mm	8.7 in
Stroke	1586 mm	62 in

Sound Performance

ISO 6395 (external)	109 dB(A)
ISO 6396 (inside cab)	74 dB(A)

- When properly installed and maintained, the cab offered by Caterpillar, when tested with doors and windows closed according to ANSI/SAE J1166 OCT98, meets OSHA and MSHA requirements for operator sound exposure limits in effect at time of manufacture.
- Hearing protection may be needed when operating with an open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in a noisy environment.

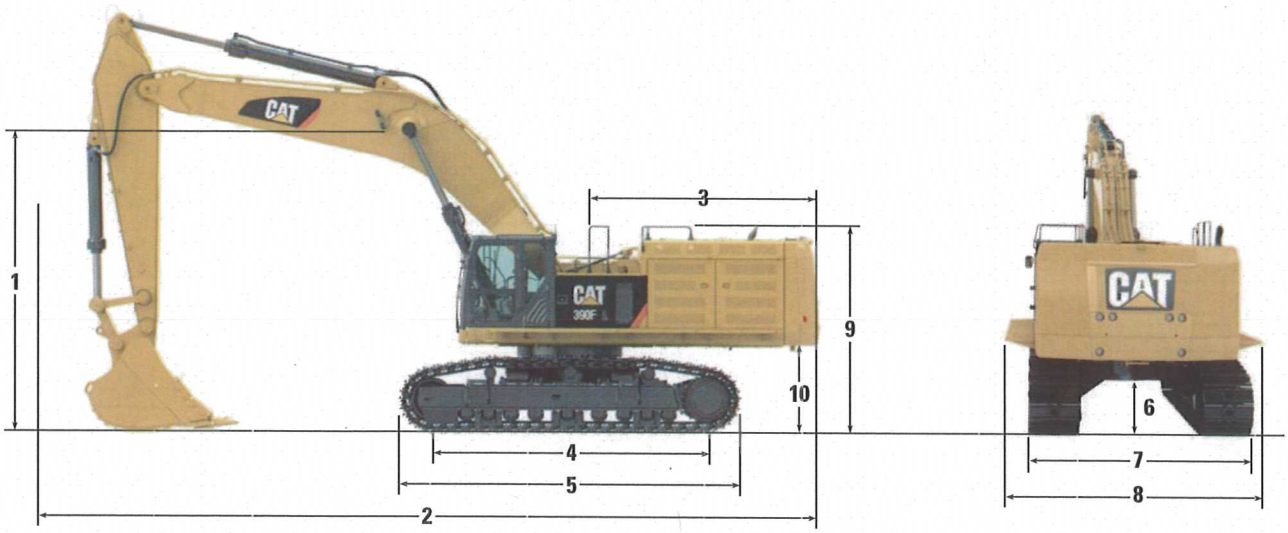
Standards

Brakes	SAE J1026 APR90
Cab/FOGS	SAE J1356 FEB88 ISO 10262

390F L Hydraulic Excavator Specifications

Dimensions

All dimensions are approximate.



Boom Options		Reach Boom 10.0 m (32'10")		GP Boom 8.4 m (27'7")				Mass Boom 7.25 m (23'9")	
Stick Options		**R5.5HB2 (18'1")**	**R4.4HB2 (14'5")**	**R5.5HB2 (18'1")**	**R4.4HB2 (14'5")**	**GP3.4JC (11'2")**	**GP2.92JC (9'7")**	**M3.4JC (11'2")**	**M2.92JC (9'7")**
1 Shipping Height	mm	5490*	5070*	5840**	5290**	5160**	5000**	5310***	4890***
	ft	18'0"*	16'8"*	19'2"**	17'4"**	16'11"**	16'5"**	17'5"***	16'0"***
2 Shipping Length	mm	16 290*	16 330*	14 500**	14 690**	14 720**	14 930**	13 550***	13 690***
	ft	53'5"*	53'7"*	47'7"**	48'2"**	48'3"**	49'0"**	44'6"***	45'0"***
3 Tail Swing Radius	mm	4700*	4700*	4700**	4700**	4700**	4700**	4700***	4700***
	ft	15'5"*	15'5"*	15'5"**	15'5"**	15'5"**	15'5"**	15'5"***	15'5"***
4 Length to Center of Rollers – Long Undercarriage	mm	5120	5120	5120	5120	5120	5120	5120	5120
	ft	16'10"	16'10"	16'10"	16'10"	16'10"	16'10"	16'10"	16'10"
5 Track Length – Long Undercarriage	mm	6358	6358	6358	6358	6358	6358	6358	6358
	ft	20'10"	20'10"	20'10"	20'10"	20'10"	20'10"	20'10"	20'10"
6 Ground Clearance	mm	900	900	900	900	900	900	900	900
	ft	2'11"	2'11"	2'11"	2'11"	2'11"	2'11"	2'11"	2'11"
7 Track Gauge – Long Undercarriage (Shipping)****	mm	2750	2750	2750	2750	2750	2750	2750	2750
	ft	9'0"	9'0"	9'0"	9'0"	9'0"	9'0"	9'0"	9'0"
8 Transport Width – Long Undercarriage									
650 mm (24 in) Shoes	mm	4160	4160	4160	4160	4160	4160	4160	4160
	ft	13'8"	13'8"	13'8"	13'8"	13'8"	13'8"	13'8"	13'8"
750 mm (30 in) Shoes	mm	4260	4260	4260	4260	4260	4260	4260	4260
	ft	14'0"	14'0"	14'0"	14'0"	14'0"	14'0"	14'0"	14'0"
900 mm (35 in) Shoes	mm	4410	4410	4410	4410	4410	4410	4410	4410
	ft	14'6"	14'6"	14'6"	14'6"	14'6"	14'6"	14'6"	14'6"
9 Guardrail Height	mm	3830	3830	3830	3830	3830	3830	3830	3830
	ft	12'7"	12'7"	12'7"	12'7"	12'7"	12'7"	12'7"	12'7"
10 Counterweight Clearance	mm	1640	1640	1640	1640	1640	1640	1640	1640
	ft	5'5"	5'5"	5'5"	5'5"	5'5"	5'5"	5'5"	5'5"

*With 3.9 m³ (5.1 yd³) bucket and 750 mm (30 in) shoes.
**With 4.6 m³ (6.0 yd³) bucket and 750 mm (30 in) shoes.
***With 6.0 m³ (7.84 yd³) bucket and 750 mm (30 in) shoes.
****Track gauge in extended (working) position: 3510 mm (11.52 ft).

$\frac{190{,}000\ \text{lb}}{17' \times 9'} \cong 1250\ \text{psf}$

Title: Callahan Mine OU3 - Profile E3
Date: 10/16/2014
File Name: Tailings_Profile-E3_Construction-Cond-90%.gsz

Name: Profile E3 - Construction - Stage 1 - 1250 psf Equip - No Cut
Method: Spencer

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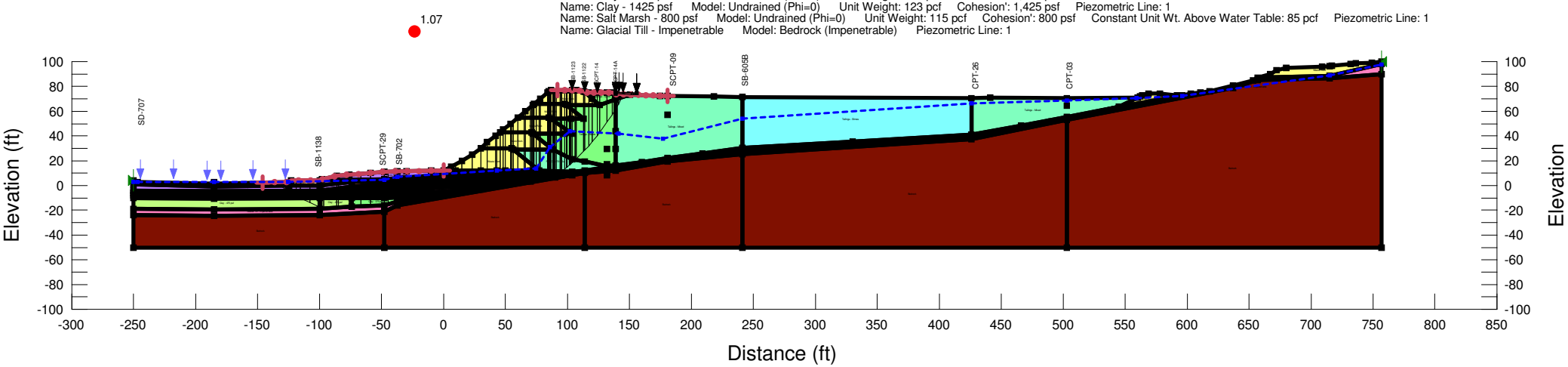
Name: Waste Rock Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 42 ° Constant Unit Wt. Above Water Table: 95 pcf Piezometric Line: 1
Name: Tailings - Sands Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 37 ° Constant Unit Wt. Above Water Table: 110 pcf Piezometric Line: 1
Name: Tailings - Mixed Model: Mohr-Coulomb Unit Weight: 117 pcf Cohesion': 0 psf Phi': 36 ° Constant Unit Wt. Above Water Table: 108 pcf Piezometric Line: 1
Name: Tailings - Slimes Model: Mohr-Coulomb Unit Weight: 114 pcf Cohesion': 0 psf Phi': 35 ° Constant Unit Wt. Above Water Table: 106 pcf Piezometric Line: 1
Name: Fill - Rock/Sand/Fines Mix Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 25 psf Phi': 36 ° Constant Unit Wt. Above Water Table: 125 pcf Piezometric Line: 1
Name: Salt Marsh - 1000 psf Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 1,000 psf Constant Unit Wt. Above Water Table: 115 pcf Piezometric Line: 1
Name: Salt Marsh - 625 psf Model: Undrained (Phi=0) Unit Weight: 115 pcf Cohesion': 625 psf Constant Unit Wt. Above Water Table: 85 pcf Piezometric Line: 1
Name: Salt Marsh - 375 psf Model: Undrained (Phi=0) Unit Weight: 110 pcf Cohesion': 375 psf Constant Unit Wt. Above Water Table: 105 pcf Piezometric Line: 1
Name: Clay - 2750 psf Model: Undrained (Phi=0) Unit Weight: 125 pcf Cohesion': 2,750 psf Piezometric Line: 1
Name: Clay - 2250 psf Model: Undrained (Phi=0) Unit Weight: 125 pcf Cohesion': 2,250 psf Piezometric Line: 1
Name: Clay - 1750 psf Model: Undrained (Phi=0) Unit Weight: 123 pcf Cohesion': 1,750 psf Piezometric Line: 1
Name: Clay - 1500 psf Model: Undrained (Phi=0) Unit Weight: 123 pcf Cohesion': 1,500 psf Piezometric Line: 1
Name: Clay - 1250 psf Model: Undrained (Phi=0) Unit Weight: 123 pcf Cohesion': 1,250 psf Piezometric Line: 1
Name: Clay - 875 psf Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 875 psf Piezometric Line: 1
Name: Clay - 750 psf Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 750 psf Piezometric Line: 1
Name: Clay - 625 psf Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 625 psf Piezometric Line: 1
Name: Clay - 550 psf Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 550 psf Piezometric Line: 1
Name: Clay - 475 psf Model: Undrained (Phi=0) Unit Weight: 118 pcf Cohesion': 475 psf Piezometric Line: 1
Name: Clay - 375 psf Model: Undrained (Phi=0) Unit Weight: 118 pcf Cohesion': 375 psf Piezometric Line: 1
Name: Fill - Clay/Till - Su Model: Undrained (Phi=0) Unit Weight: 125 pcf Cohesion': 2,000 psf Constant Unit Wt. Above Water Table: 120 pcf Piezometric Line: 1
Name: Bedrock Model: Bedrock (Impenetrable) Piezometric Line: 1
Name: Gravel Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 0 psf Phi': 36 ° Constant Unit Wt. Above Water Table: 125 pcf Piezometric Line: 1
Name: Clay - 800 psf Model: Undrained (Phi=0) Unit Weight: 121 pcf Cohesion': 800 psf Piezometric Line: 1
Name: Clay - 1075 psf Model: Undrained (Phi=0) Unit Weight: 122 pcf Cohesion': 1,075 psf Piezometric Line: 1
Name: Clay - 400 psf Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 400 psf Piezometric Line: 1
Name: Clay - 450 psf Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 450 psf Piezometric Line: 1
Name: Clay - 700 psf Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 700 psf Piezometric Line: 1
Name: Clay - 925 psf Model: Undrained (Phi=0) Unit Weight: 120 pcf Cohesion': 925 psf Piezometric Line: 1
Name: Clay - 1350 psf Model: Undrained (Phi=0) Unit Weight: 123 pcf Cohesion': 1,350 psf Piezometric Line: 1
Name: Clay - 1425 psf Model: Undrained (Phi=0) Unit Weight: 123 pcf Cohesion': 1,425 psf Piezometric Line: 1
Name: Salt Marsh - 800 psf Model: Undrained (Phi=0) Unit Weight: 115 pcf Cohesion': 800 psf Constant Unit Wt. Above Water Table: 85 pcf Piezometric Line: 1
Name: Glacial Till - Impenetrable Model: Bedrock (Impenetrable) Piezometric Line: 1



Title: Callahan Mine OU3 - Profile E3
Date: 10/16/2014
File Name: Tailings_Profile-E3_Construction-Cond-90%.gsz

Name: Profile E3 - Construction - Stage 2 - 1250 psf Equip - 10 ft Cut
Method: Spencer

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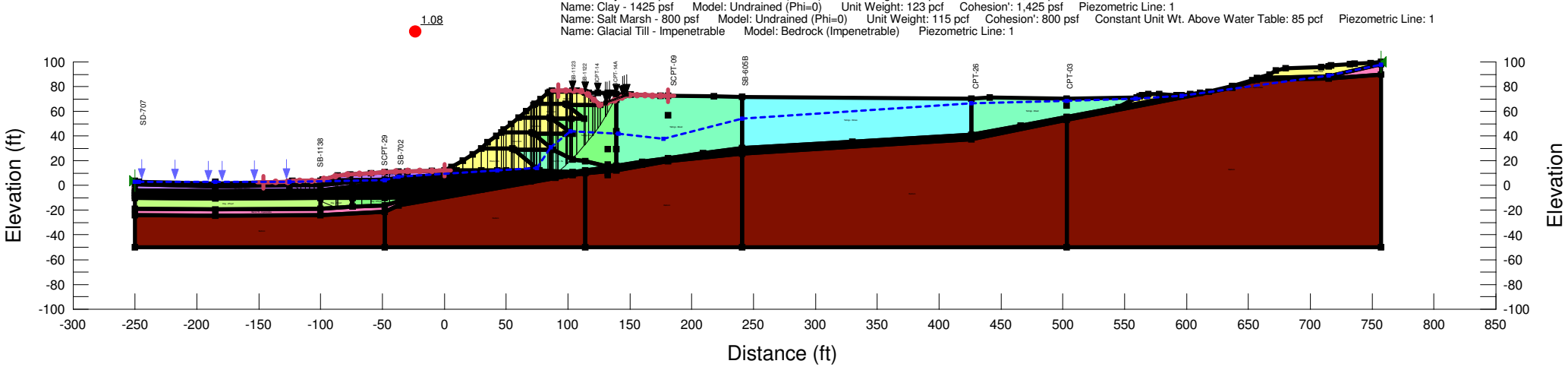
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