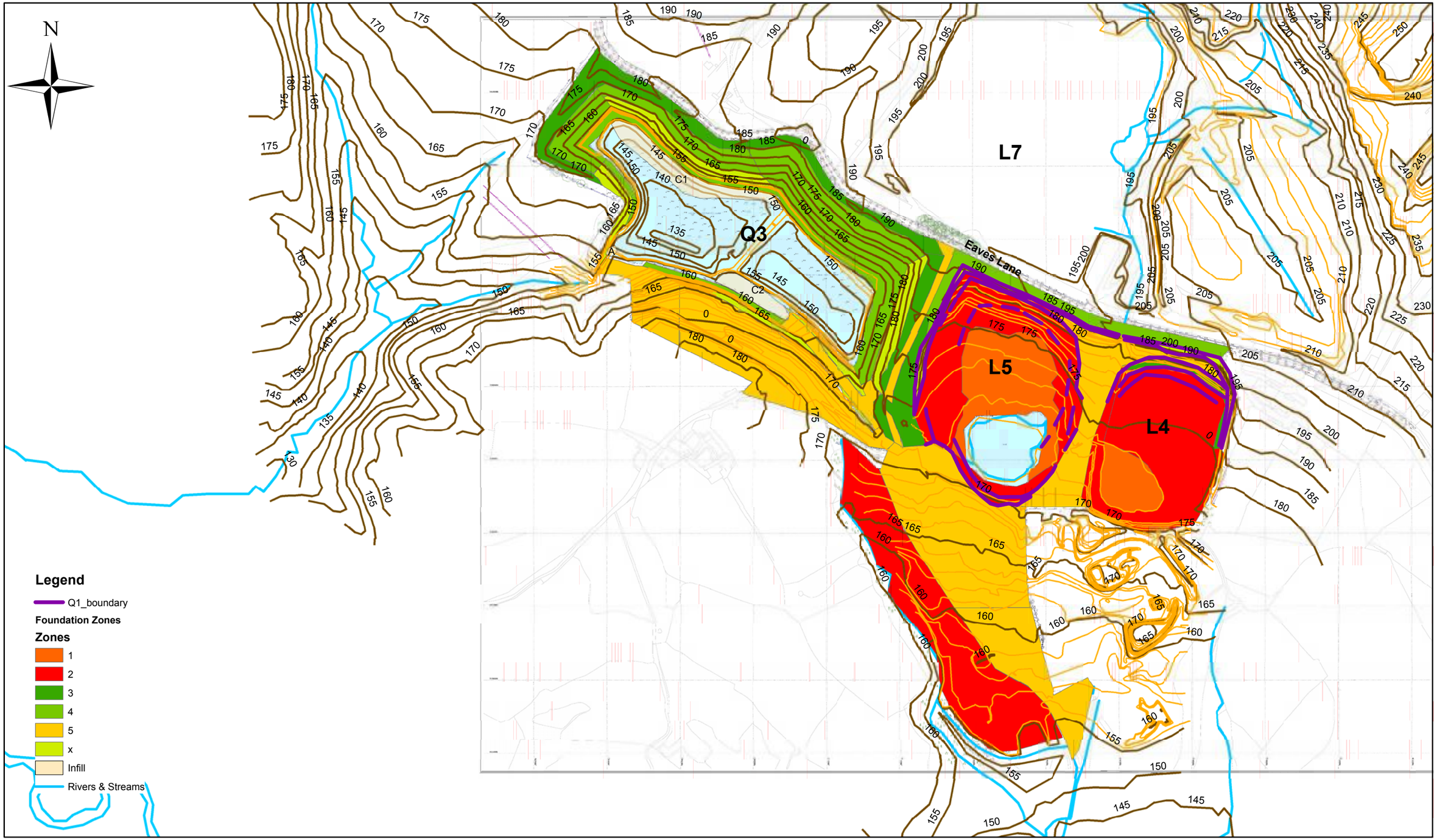

Abbeydale
Building Environment Consultants
4 Neville Street WF1 5EF Tel: 01924 376622
www.abbeydalebec.com

1:5,000 @ **A3**

0 95 190 380 Meters

2018 FOUNDATION ZONE PLAN

Project: Moneystone Park
Job No: 418055
Client: Laver Leisure

Fig

Abbeydale
4 Neville Street WF1 5EF Tel: 01924 376622
www.abbeydalebec.com

1:2,000 @ A3

0 40 80 160 Meters

2018 EARTHWORKS HEATMAP Q1

Project: Moneystone Park
Job No: 418055
Client: Laver Leisure

Fig 2H1

Abbeydale
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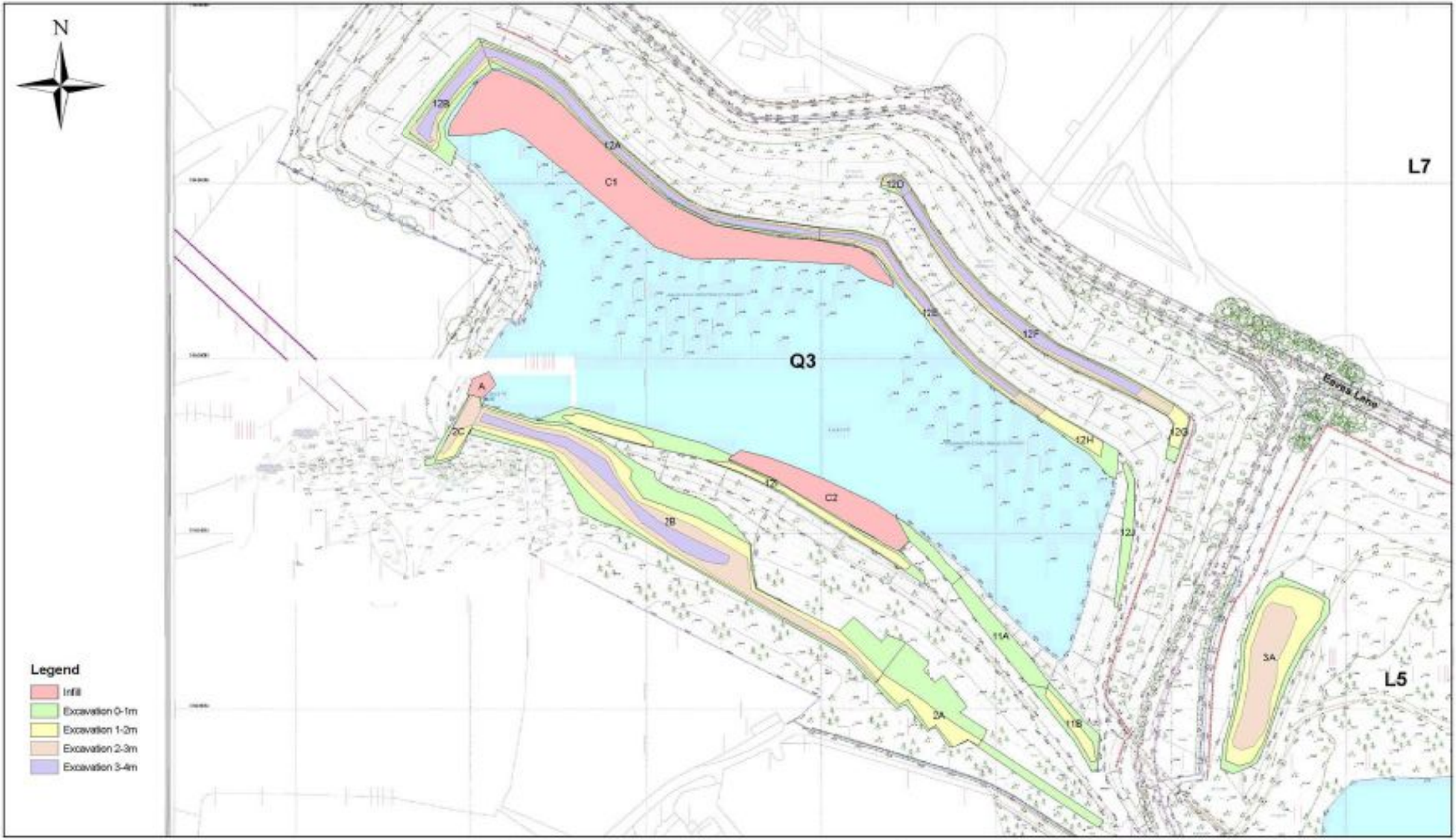
1:2,000 @ A3

0 40 80 160 Meters

2018 EARTHWORKS HEATMAP Q1

Project: Moneystone Park
Job No: 418055
Client: Laver Leisure

Fig 2H2



Abbeydale
4 Neville Street WF1 5EF Tel: 01924 376622
www.abbeydalebec.com

1:2,000 @ A3

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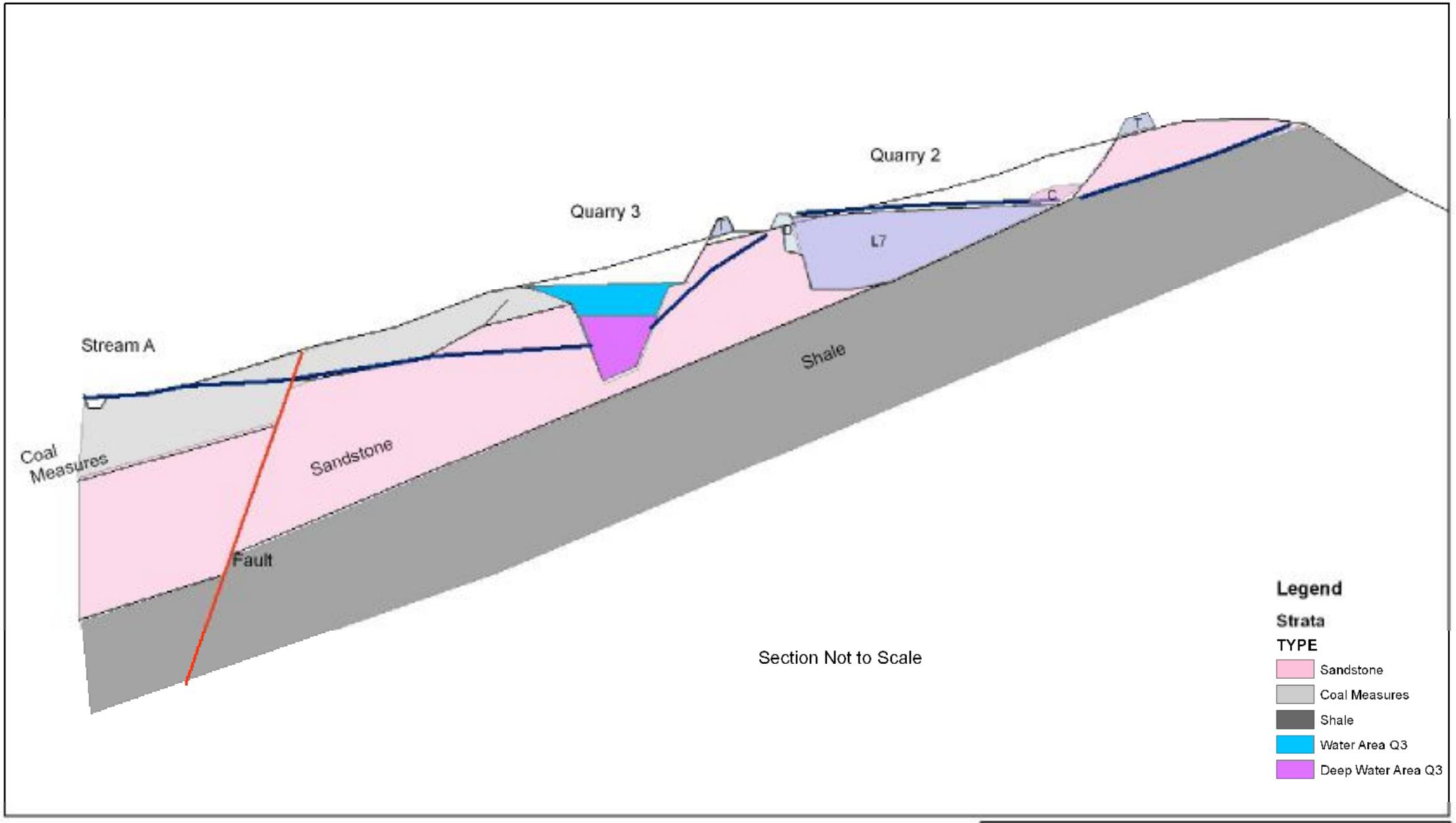
2018 EARTHWORKS HEATMAP Q3

Project: Moneystone Park
Job No: 418055
Client: Laver Leisure

Fig 2H3

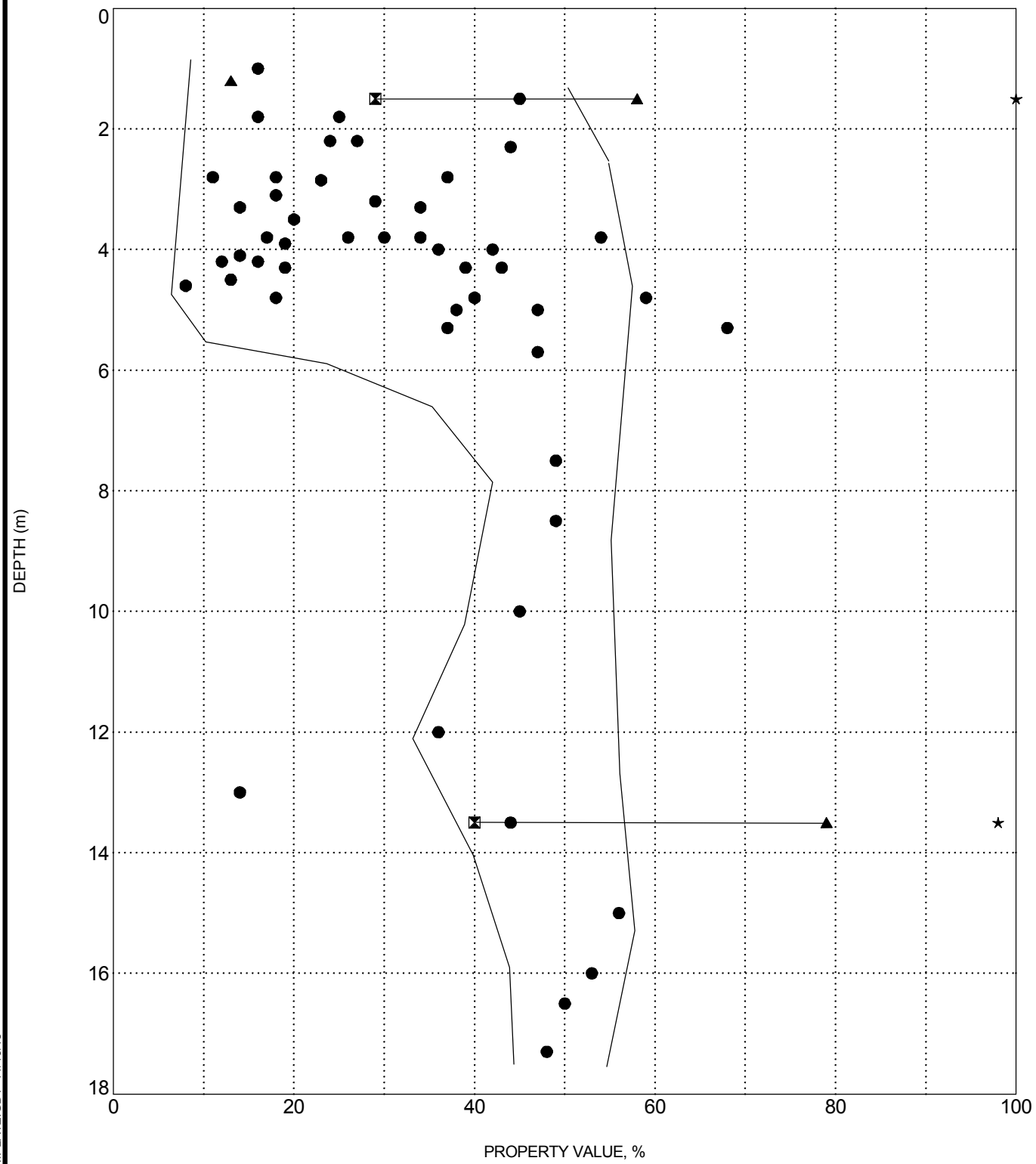


Typical Section

Project: Moneystone Quarry Oakamoor
Job No: 418040
Client: Bolsterstone plc
January 2011

Fig 3

Abbeydale
Building Environment Consultants
4 Neville Street WF1 5EF Tel: 01924 376622 www.abbeydalebec.com



LEGEND
● Water Content
⧓ Plastic Limit
▲ Liquid Limit
★ Fines

Abbeydale
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

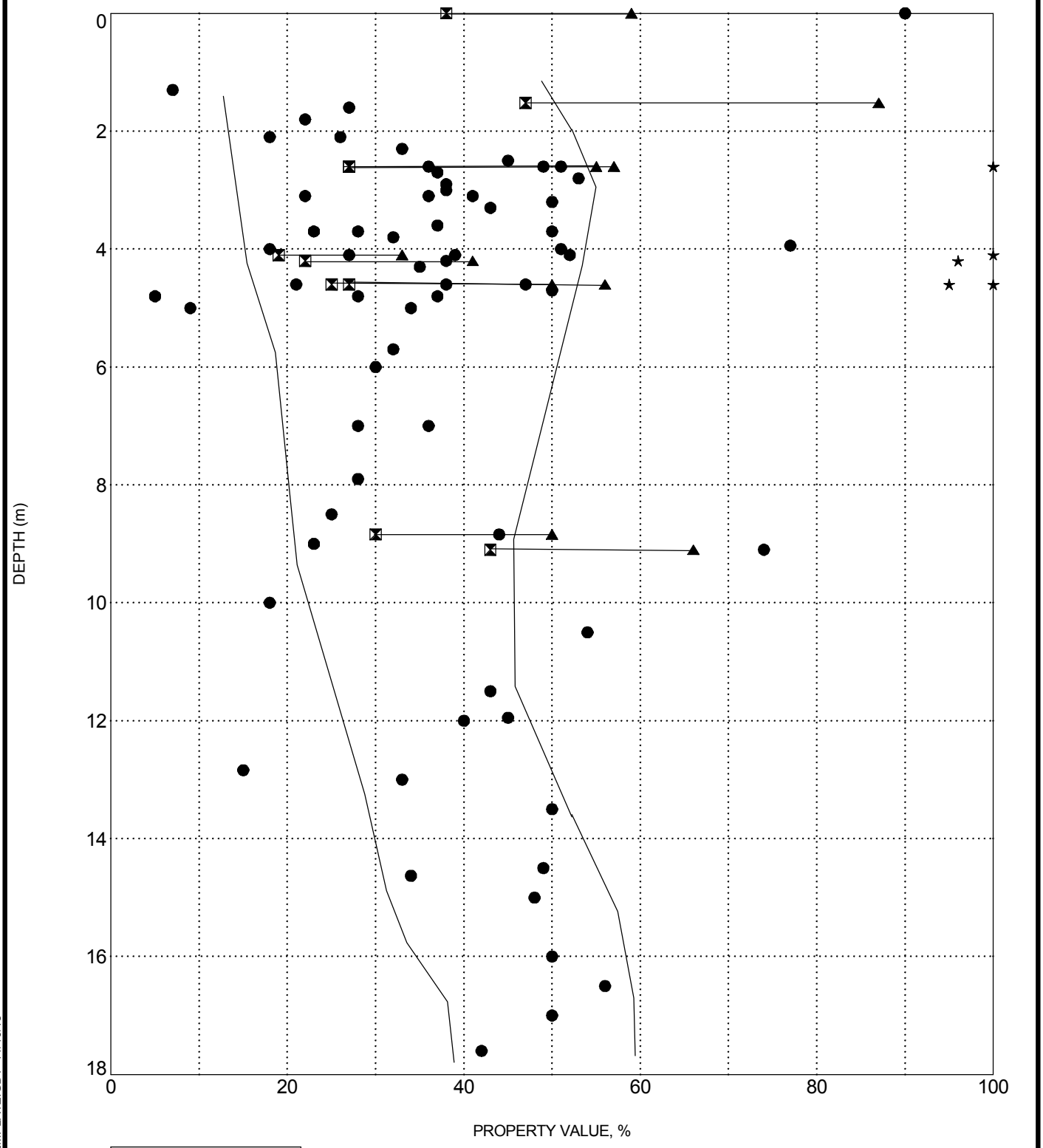
T5 INDEX PROPERTIES VERSUS DEPTH

Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

FIG 4B



LEGEND
● Water Content
⊠ Plastic Limit
▲ Liquid Limit
★ Fines

Abbeydale
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

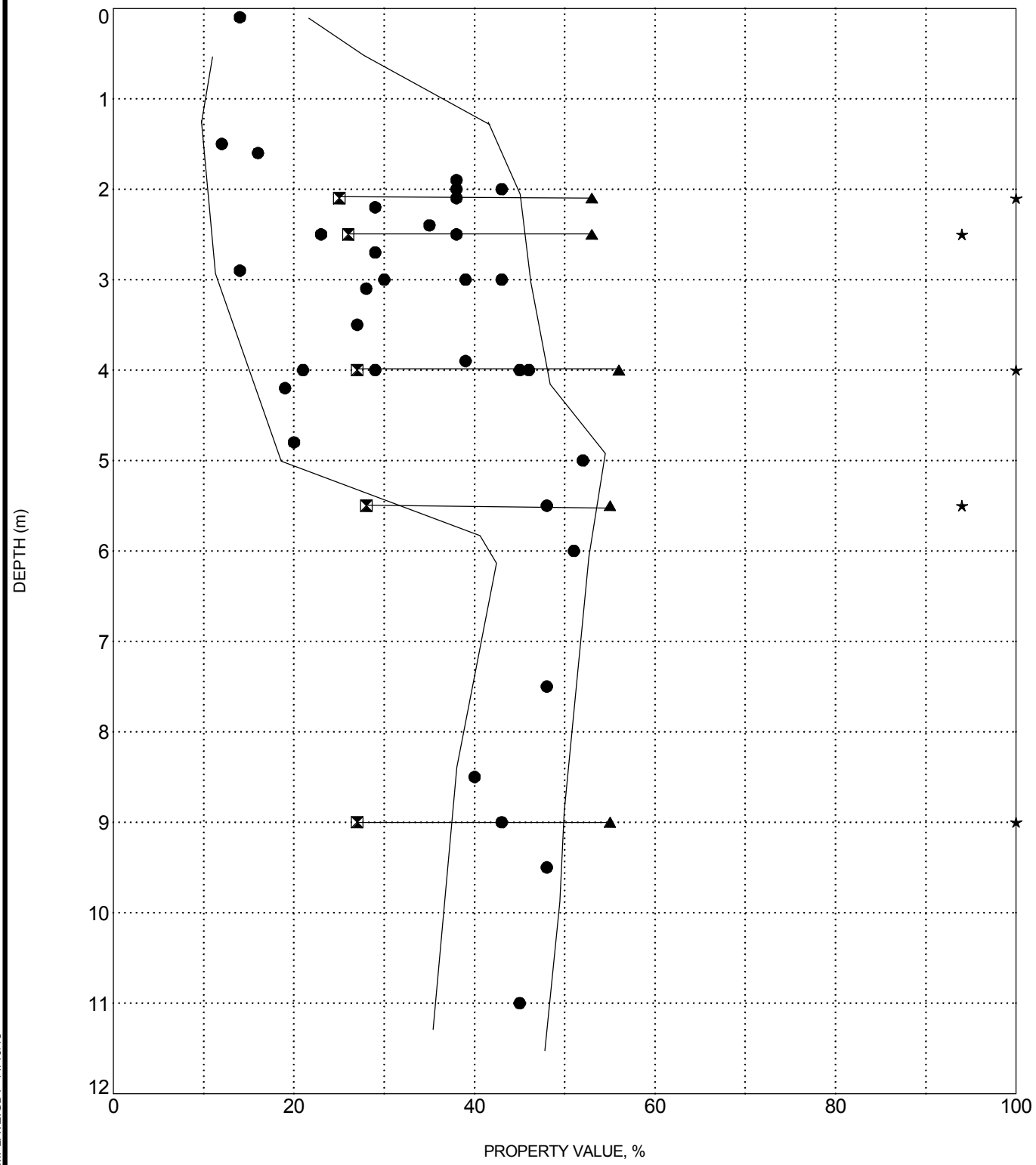
T4 INDEX PROPERTIES VERSUS DEPTH

Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

FIG 4E



LEGEND
● Water Content
⊠ Plastic Limit
▲ Liquid Limit
★ Fines

Abbeydale
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

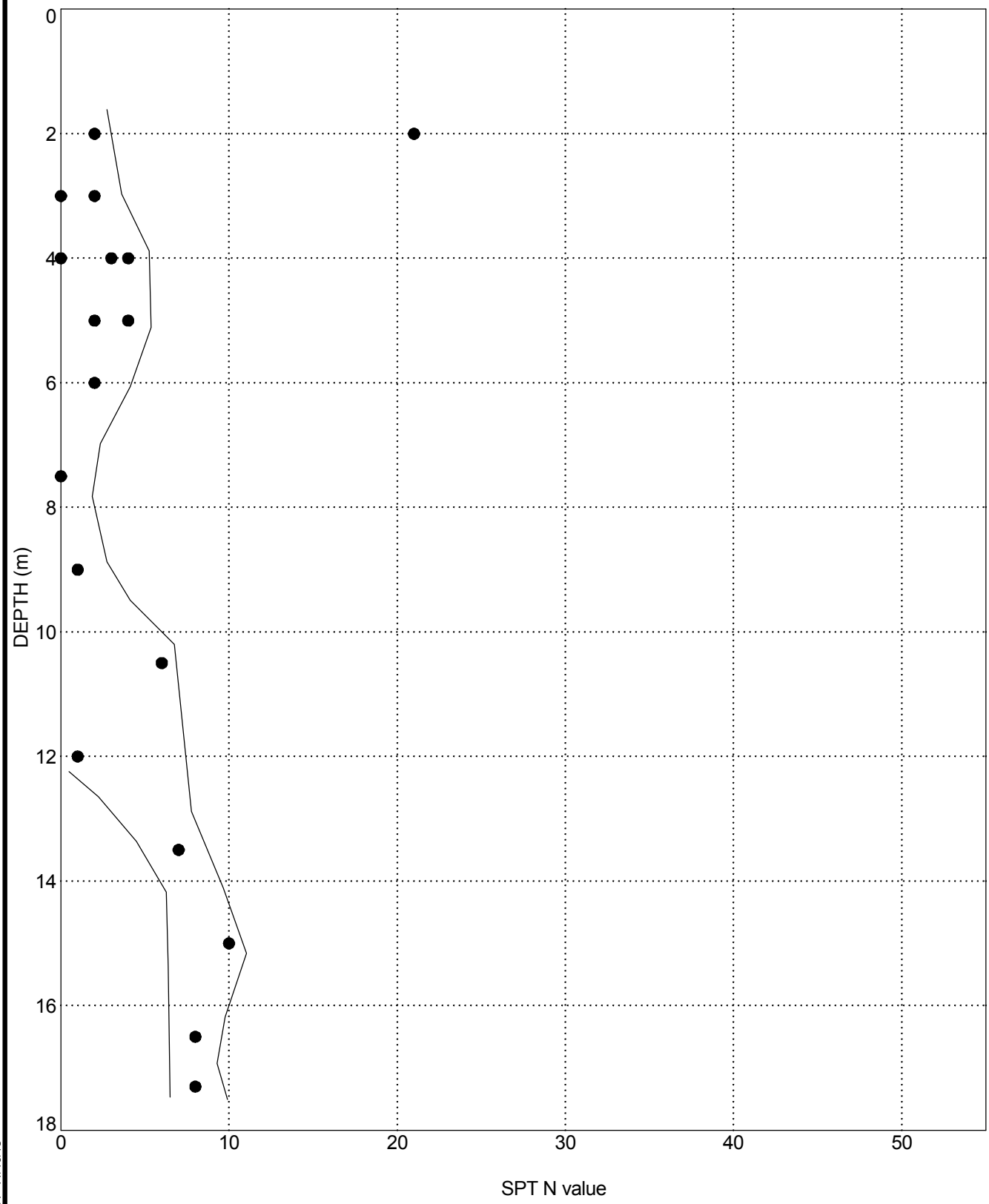
T3 INDEX PROPERTIES VERSUS DEPTH

Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

FIG 4L



AREA B T5 SPT RESULTS

Abbeydale
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

SPT VERSUS DEPTH

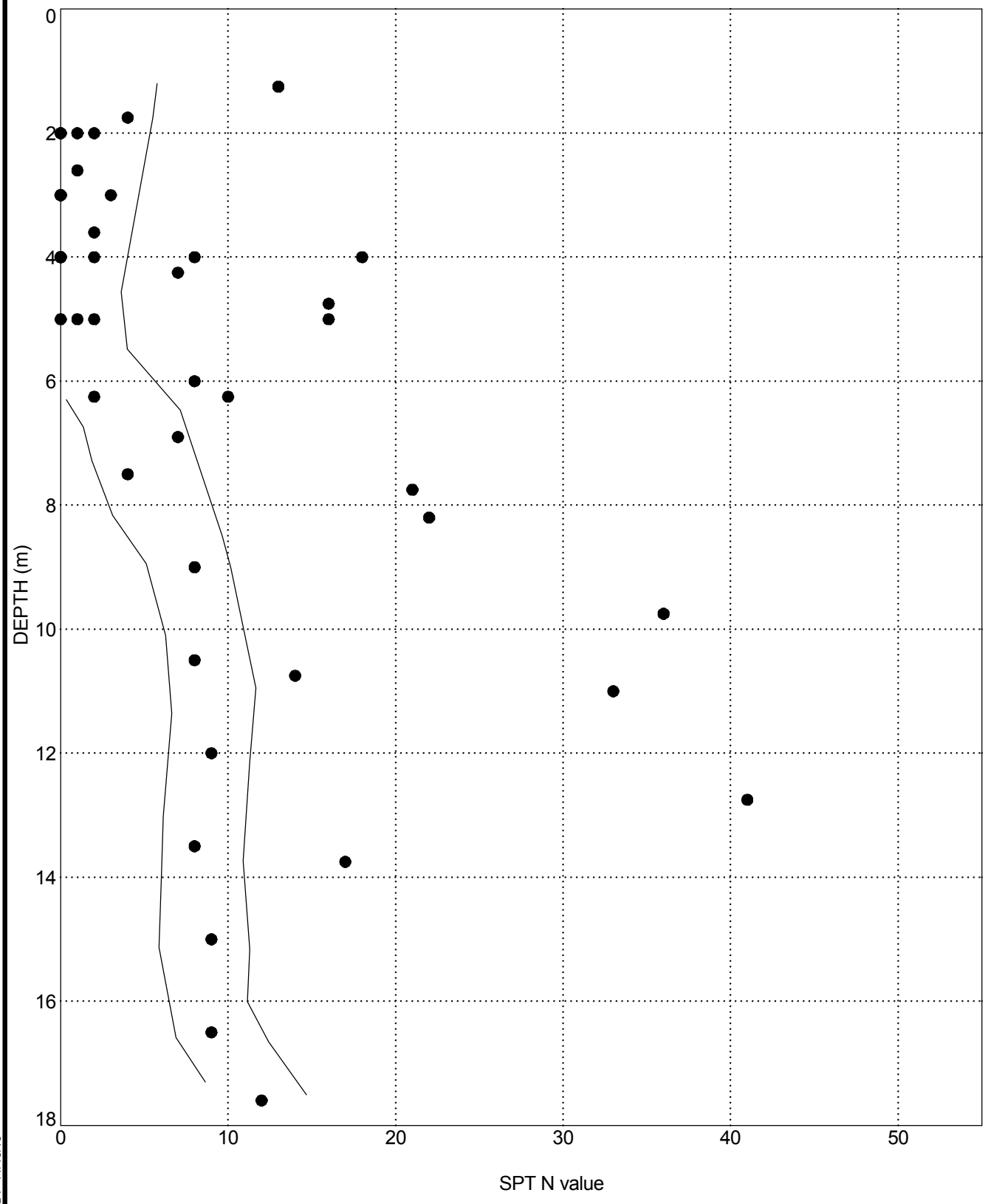
Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

FIG 5B b

SPT VS DEPTH 418055.GPJ ABEC TEMPLATE.GDT 11/10/18



AREA E T4 SPT RESULTS

SPT VERSUS DEPTH

Abbeydale
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

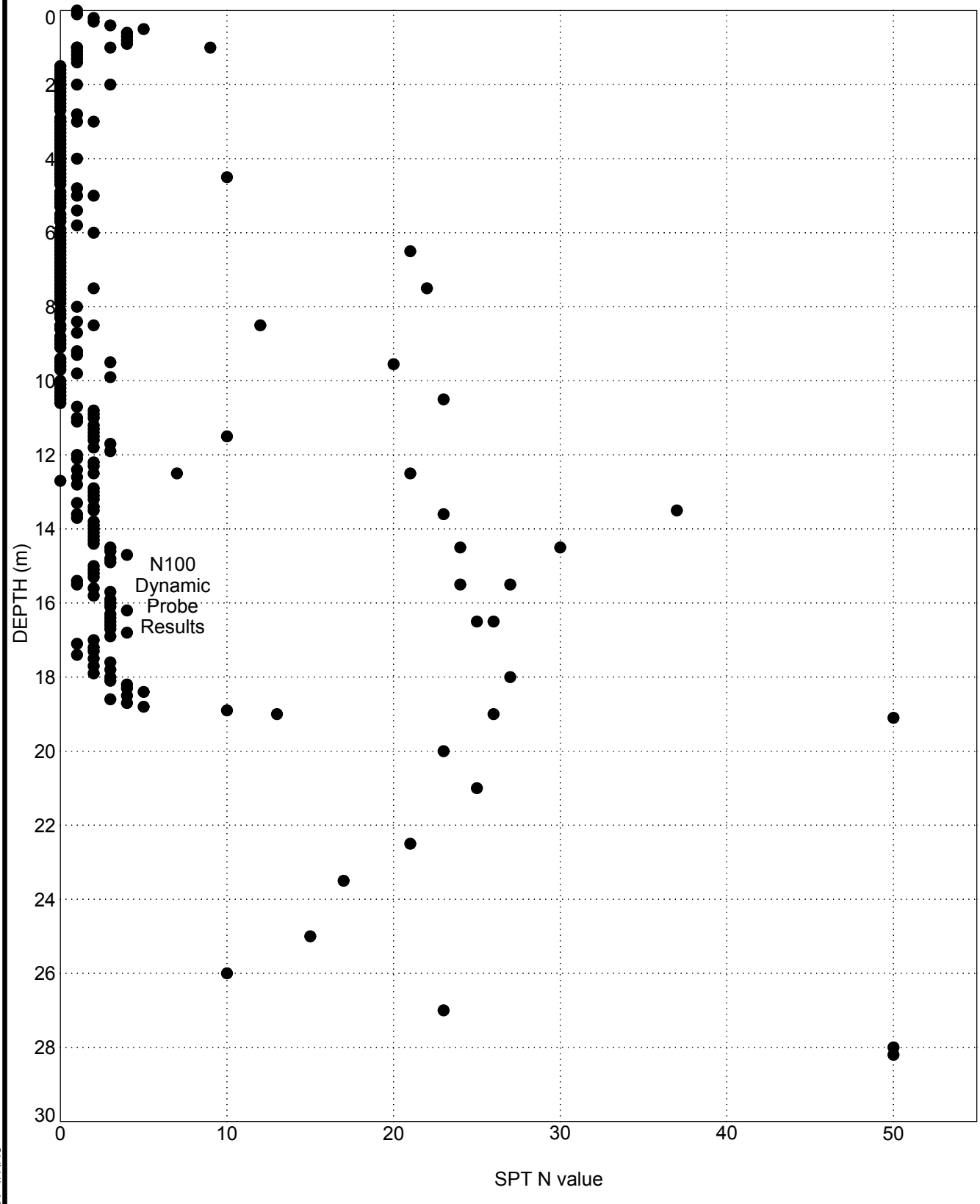
Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

Fig 5E b

SPT VS DEPTH 418055.GPJ ABEC TEMPLATE.GDT 11/10/18



AREA L T3 RESULTS

SPT VERSUS DEPTH

Client: Laver Leisure

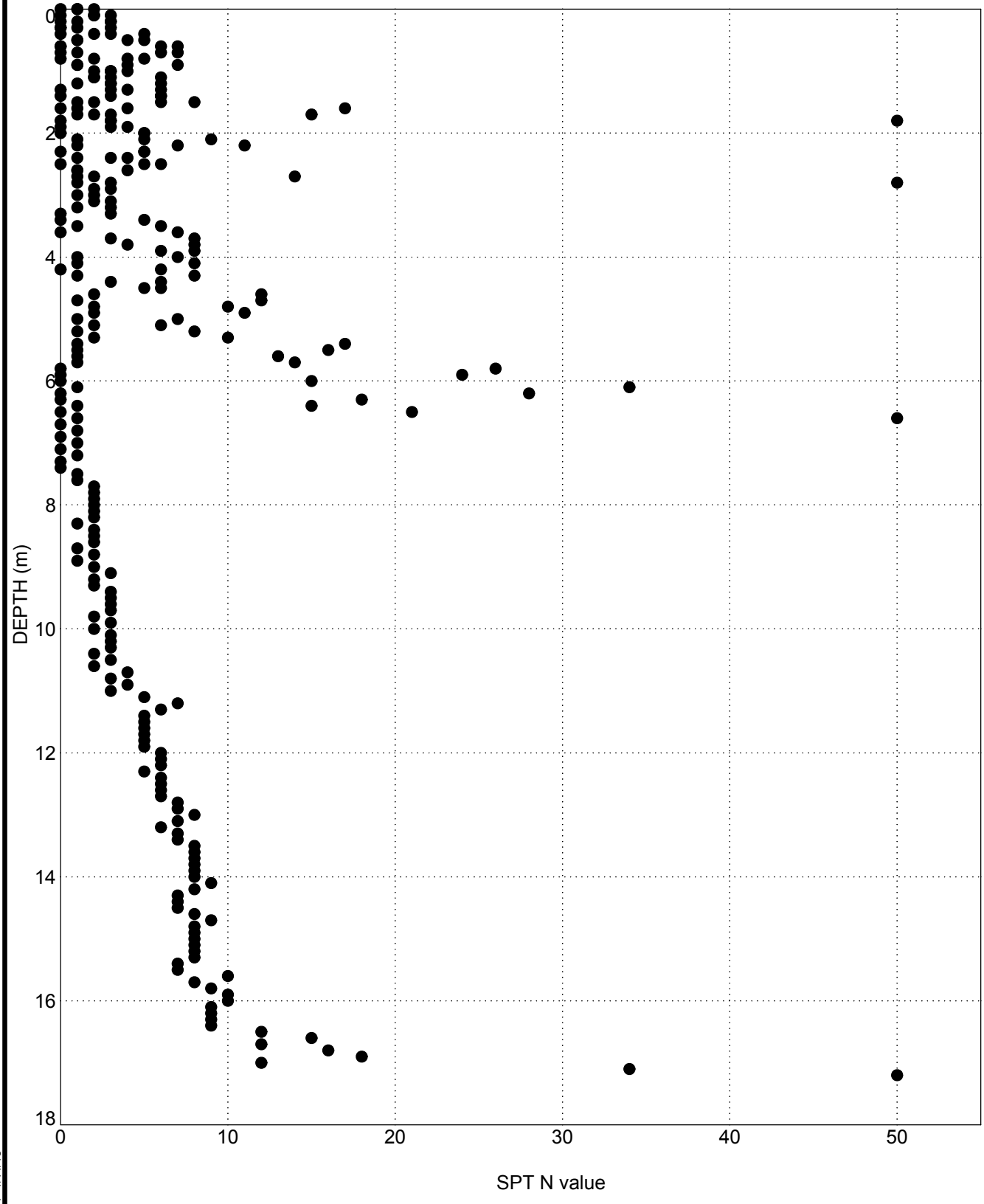
Project: Moneystone Activity Park SI

Number: 418055

Fig 5L

Abbeydale
Building Environment Consultants
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

SPT VS DEPTH 418055.GPJ ABEC TEMPLATE.GDT 1/11/18



Abbeydale
Building Environment Consultants
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

N100 Dynamic Probe VS DEPTH

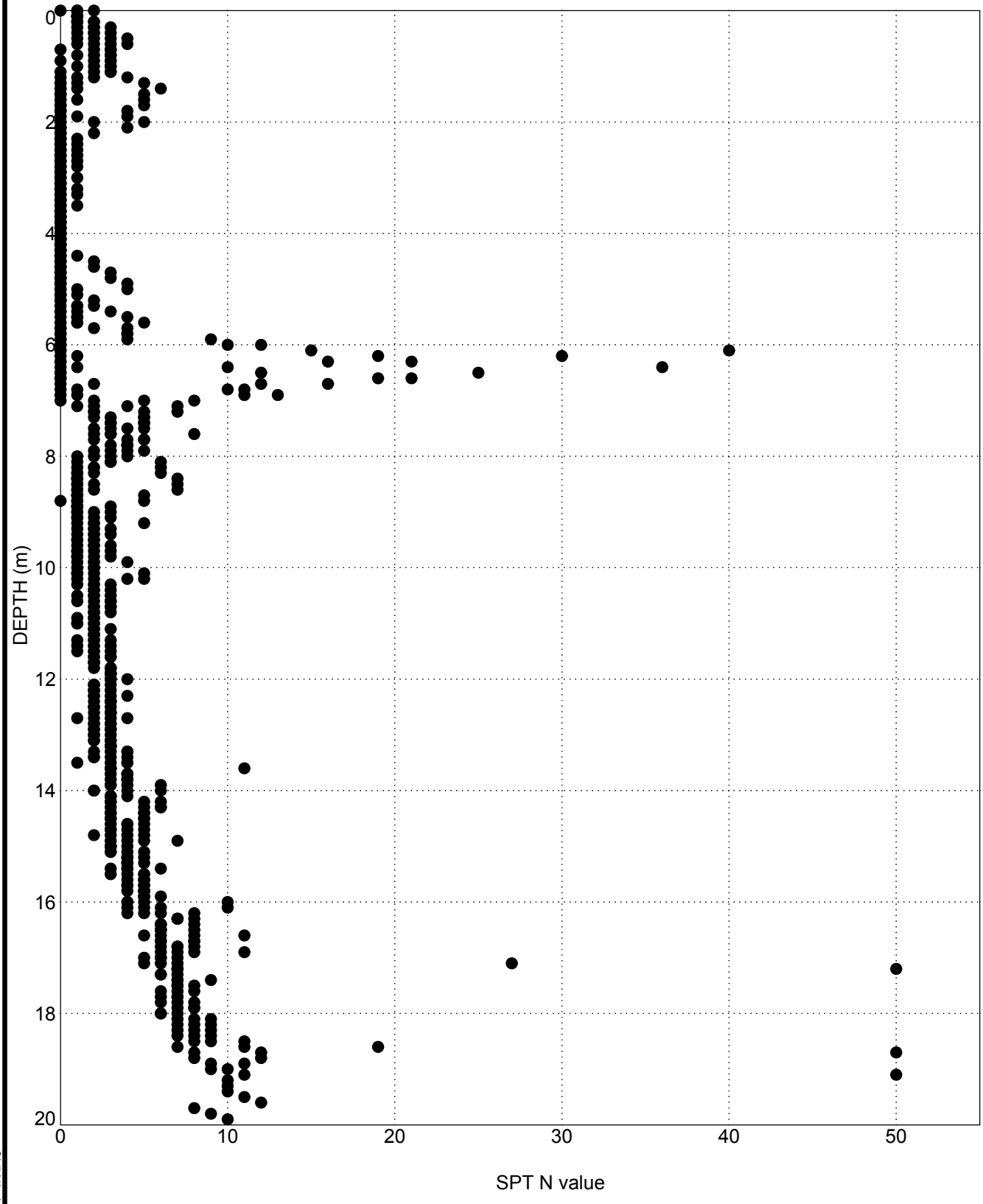
Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

Fig 6B

SPT VS DEPTH 418055.GPJ ABEC TEMPLATE.GDT 1/11/18



AREA E T4 RESULTS

N100 Dynamic Probe VS DEPTH

Client: Laver Leisure

Project: Moneystone Activity Park SI

Number: 418055

Fig 6E

Abbeydale
Building Environment Consultants
4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622
E-mail: abbeydale1@btconnect.com

SPT VS DEPTH 418055.GPJ ABEC TEMPLATE.GDT 1/11/18

APPENDIX A

List of Past and Recent Investigation Reports

Quarry References

1. WBB Minerals - Moneystone Quarry Oakamoor, Quarries Regulations 1999, Geotechnical Assessment 2007. October 2008. Report Ref M0201/08/R85F. *Includes topography plans, photos, Piezometer data, oppertating rules and design drawings for L4 & L7.*

2. Binnie & Partners - British Industrial Sand Ltd. Moneystone Quarries Oakamoor. Second report on the use of Disused Quarries for the Disposal of Slurry Waste. October 1984. *Includes logs, photos, plans, sections and testing.*

3. Knight Piesold & Partners. Hepworth Minerals and Chemicals Ltd. Slope Stability Analysis of Oakamoor Quarry, Staffordshire. May 1996. Report Ref 11126\R9350\rjhp. *Includes sections, plans and photographs*

4. Donaldson Associates Limited. Ritchies Ltd. Tunnel Assessment Report. Moneystone Quarry Staffordshire. January 2002. Job No. JS176. *Includes plans, rock mass classification, logs, photos (poor quality),geological mapping, stereographic projections and unwedge analysis*.

5. Plan HP 5.1 Q2E Borehole Location Survey Date 22.22.94. Scale 1:1250. May 1994.

6. Plan HP 5.2 Q2E Borehole Location Survey Date 22.22.94. Scale 1:1250. June 1994.

7. Plan HP 5.3 Q2E Geological Section. Scale 1:1250 / 1:500. May 1994.

8. Plan HP 6.1 Q2 Geological Section. Scale 1:1250 / 1:500. June 1994.

9. Plan HP 7.1 Oakamoor Base of Sandstone contour plan. Scale 1:5000. March 2004.

10. Plan HP 8.2 British Industrial Sand Ltd. Frame Wood Oxide and Clay Pits. Tip 2. Dwg Ref S.OM. 120. Scale 1:500.

11. Plan HP 15.2. British Industrial Sand Ltd. Geological Map of Oakamoor Area. Tip Nos 1&3, 2 and Framewood Clay Tip. Scale 6” to 1 mile.

12. Plan HP 8.3. British Industrial Sand Ltd - Oakamoor. Sections Tip No. 2 Frame Wood. A B Daily Son & Clarke. Job No. 479. Dwg No. 21 Rev B. Scale 1:500. April 1974.

13. Plan HP 8.4. British Industrial Sand Ltd - Oakamoor. Sections Tip No. 2 Frame Wood. A B Daily Son & Clarke. Job No. 479. Dwg No. 22 Rev A. Scale 1:500. July 1974.

14. Report HR 8.1 Sibelco Minerals and Chemicals Ltd. Moneystone Quarry Staffordshire. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. 2 Frame Wood Clay. CLOSED. May 2001.

15. Report HR 8.2. British Industrial Sand. Tip No. 2 Frame Wood Clay. Report in pursurance of Regulations 12(1) of the Mines and Quarries (Tips) Regulations 1971. A B Daily Son & Clarke. March 1978.

16. Report HR 8.3. Logs for Boreholes Nos. 18, 21, 22 and 24 (Tip 2 Frame Wood Clay) June 1968.

17. Report HR 8.4. British Industrial Sand Ltd. Frame Wood Clay Tip 2. Letter from A B Daily Son & Clarke (on the design of the tip). July 1974.

18. Plan HP 9.1. British Industrial Sand Ltd. Geological Map of Oakamoor Area. Black Plantation Area. Scale 6" to 1 mile. April 1978.

19. Report HR 9.1 Sibelco Minerals and Chemicals Ltd. Moneystone Quarry Staffordshire. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tio No. 3 "Moneystone". CLOSED. May 2001.

20. Report HR 9.2. M&Q Form No. 319. Mines and Quarries (Tips) Regulations 1971. Cessation of Tipping Operations at British Industrial Sand Ltd Moneystone Quarry Staffordshire. Tip No. 3 Moneystone. October 1984.

21. Report HR 9.3 Tip Tip No. 3 Moneystone. Report outlining past history for attachment to a report in pursuance of the Mines and Quarries (Tips) Regulations 1971. A B Daily Son & Clarke. With BH10 log and location plan.

22. Report HR 10.1 Sibelco Minerals and Chemicals Ltd. Moneystone Quarry Staffordshire. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. 4 "Black Plantation" CLOSED. May 2001.

23. Report HR 10.2. Tip No. 4 Black Plantation, Tip No. L2 "Easte Field Conveyor" Letter from E R Giles October 1985.

24. Report HR 10.3. Moneystone Quarry Staffordshire, British Industrial Sand. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. 4 "Black Plantation" CLOSED. March 1985.

25. Report HR 10.4. M&Q Form No. 319. Mines and Quarries (Tips) Regulations 1971. Cessation of Tipping Operations at British Industrial Sand Ltd Moneystone Quarry Staffordshire. Tip No. 4 Black Plantation February 1982.

26. Report HR 10.5. Tip No. 4 Black Plantation. Report outlining past history for attachment to a report in pursuance of the Mines and Quarries (Tips) Regulations 1971. A B Daily Son & Clarke. With BH09 log.

27. Report HR 11.1. Sibelco Minerals and Chemicals Ltd. Moneystone Quarry Staffordshire. Report Under Regulation 12 of the Mines and Quarries (Tips) Regulations 1971. Tip No.7 Q1E ACTIVE. May 2001.

28. Report HR 11.2. Report on the site, design and method of tipping at the Oakamoor quarry of the British Industrial Sand Ltd. To be known as Tip 7 No. 1 QE. Ref RJD/ARF/479. R J Dailey. Dated July 1984.

29. Report HR 11.3. Moneystone Quarry Staffordshire, British Industrial Sand. Report under Regulations 1 of the Mines and Quarries (Tips) Regukations 1971. Tip No. 7 Q1E ACTIVE. February 1985.

30. Report HR 11.3. Tipping Rules for Tip No. T7. Q1E. August 1999.

31. Plan HP 15.1. Ref. SM 33 Drawing shows Mud Ponds Nos 1 and 2. Scale 1:1250.

32. Plan HP 15.3. British Industrial Sand Ltd - Oakamoor Staffordshire. Plan showing location of mud pits L2 and L3. Dwg Ref SM24. Scale 1:1250. November 1960.

33. Plan HP 15.4. British Industrial Sand Ltd - Oakamoor Staffordshire. A4 extract from HP15.3 with edits shpwing monitoring stations. A B Daily Son & Clarke. Job No. 479.

34. Report HR 15.1. Sibelco Minerals and Chemicals Ltd. Moneystone Quarry Staffordshire. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. L2 2East Field Conveyor" CLOSED. May 2001.

35. Report HR 15.2. Tip No. L2 East Field Conveyor. Report in pursuance of Regulations 12(1) of the Mines and Quarries (Tips) Regulations 1971. A B Dailey Sone & Clarke.

36. Report HR15.3. Tip No. L2 East Field Conveyor. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. E R Giles.

37. Report HR 15.4. Extensions to Clay Process Building (L2), Moneystone Quarry for British Industrial Sand Ltd. Letter from Manchester Geotechnical. October 1979.

38. Plan HP 16.1. British Industrial Sand Ltd - Oakamoor. No. 3 mud pond. Ref. S/OM/104. Scale 1:500. January 1966.

39. Plan HP 8.1. British Industrial Sand Ltd. Dwg Ref. S/OM. Scale 1:2500. December 1971.

40. Plan HP 16.2. British Industrial Sand Ltd - Oakamoor. Nos. 1 and 3 Mud Ponds. Ref. S/OM/116. Scale 1:500. June 1967.

41. Report HR 16.1. Sibelco Minerals and Chemicals Ltd. Moneystone Quarry Staffordshire. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. L3 Key Wood. CLOSED. May 2001.

42. Report HR 16.2. Moneystone Quarry Staffordshire, British Industrial Sand. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. L3 Key Wood. CLOSED. January 1985.

43. Report HR 16.3. Moneystone Quarry Staffordshire, British Industrial Sand. Report Under Regulations 18 of the Mines and Quarries (Tips) Regulations 1971. Tip No. L3 Key Wood. CLOSED. November 1984.

44. Report HR 16.4. M&Q Form No. 319. Mines and Quarries (Tips) Regulations 1971. Cessation of Tipping Operations at British Industrial Sand Ltd Moneystone Quarry Staffordshire. Tip No. L3 Key Wood November 1983.

45. Report HR 16.5. Tip No. L3 Key Wood. Report in pursuance of Regulations 12(1) of the Mines and Quarries (Tips) Regulations 1971. A B Dailey Sone & Clarke. August 1982.

46. Report HR 16.6. Tip No. L3 Key Wood. Report in pursuance of Regulations 12(1) of the Mines and Quarries (Tips) Regulations 1971. A B Dailey Sone & Clarke. November 1980.

47. Report HR 16.7. Tip No. L3 Key Wood. Report in pursuance of Regulations 12(1) of the Mines and Quarries (Tips) Regulations 1971. A B Dailey Sone & Clarke. February 1978.

48. Report HR 16.8. Report on a Site Investigation at Moneystone Quarry for A B Daily, Son & Clarke. Report No. 4756/DA. March 1966. *Includes sample descriptions and SPTs.*

49. WBB Minerals - Desk Study and Phase 1 Geo-Environmental Assessment, Moneystone Quarry, Staffordshire. Version 01 - June 2008. DRAFT.

50. MCG Consultancy Services Ltd - Moneystone Quarry Oakamoor, Quarries Regulations 1999, Geotechnical Assessment 2003. Report Ref. M0302/08/R11F. September 2004.

51. Binnie & Partners - British Industrial Sand Ltd. Moneystone Quarries Oakamoor. Development of Disused Quarry Areas for the Disposal of Slurry Waste. February 1982.

52. Report HR 18.1. Report under Rgulation 12 of the Mines and Quarries (Tips) Regulations 1971. Tip No. L5 “No.1 Quarry West” ACTIVE. Sibelco Minerals and Chemicals Ltd. May 2001

53. Report HR 18.2. Logs for Boreholes 2, 3 & 4 at Crowtrees. January 1956.

54. The Proposed Extension To Silica Sandstone Extraction Operations With Progressive Restoration - Moneystone Quarry, Whiston Eaves Lane, Near Whiston, Staffordshire - 2006 - Environmental Statement - WBB Minerals

55. WBB Borehole Assessment for Quarry Extension, 2006 (in Excel format)

A. Nathanail, C.P., McCaffery, C., Ashmoor, M.H., Cheng Y.Y., Gillett, A., Ogden, R. & Scott, D. 2009. The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition). Land Quality Press, Nottingham.

B. Nathanail, J., Nathanail, P., & Bardos, P. 2007. Contaminated Land Management : Ready Reference (Release 2).

C. Contaminated Lane Exposure Assessment (CLEA) Software (Version 1.06). 2009. Environment Agency.

D. Contaminated Lane Exposure Assessment (CLEA) Software (Version 1.05) Handbook. Science Report SC050021/SR4. 2009. Environment Agency.

E. Updated Technical Background to the CLEA Model. Science Report SC050021/SR3. January 2009. Environment Agency.

F. Human Health Toxilogical Assessment of Contaminants in Soil. Science Report - Final SC050021/SR2. January 2009. Environment Agency.

G. The Soil Generic Assessment Criteria for Human Health Risk Assessment. CL:AIRE, AGS, EIC. DECEMBER 2009.

APPENDIX B

Additional Slope Stability Analysis

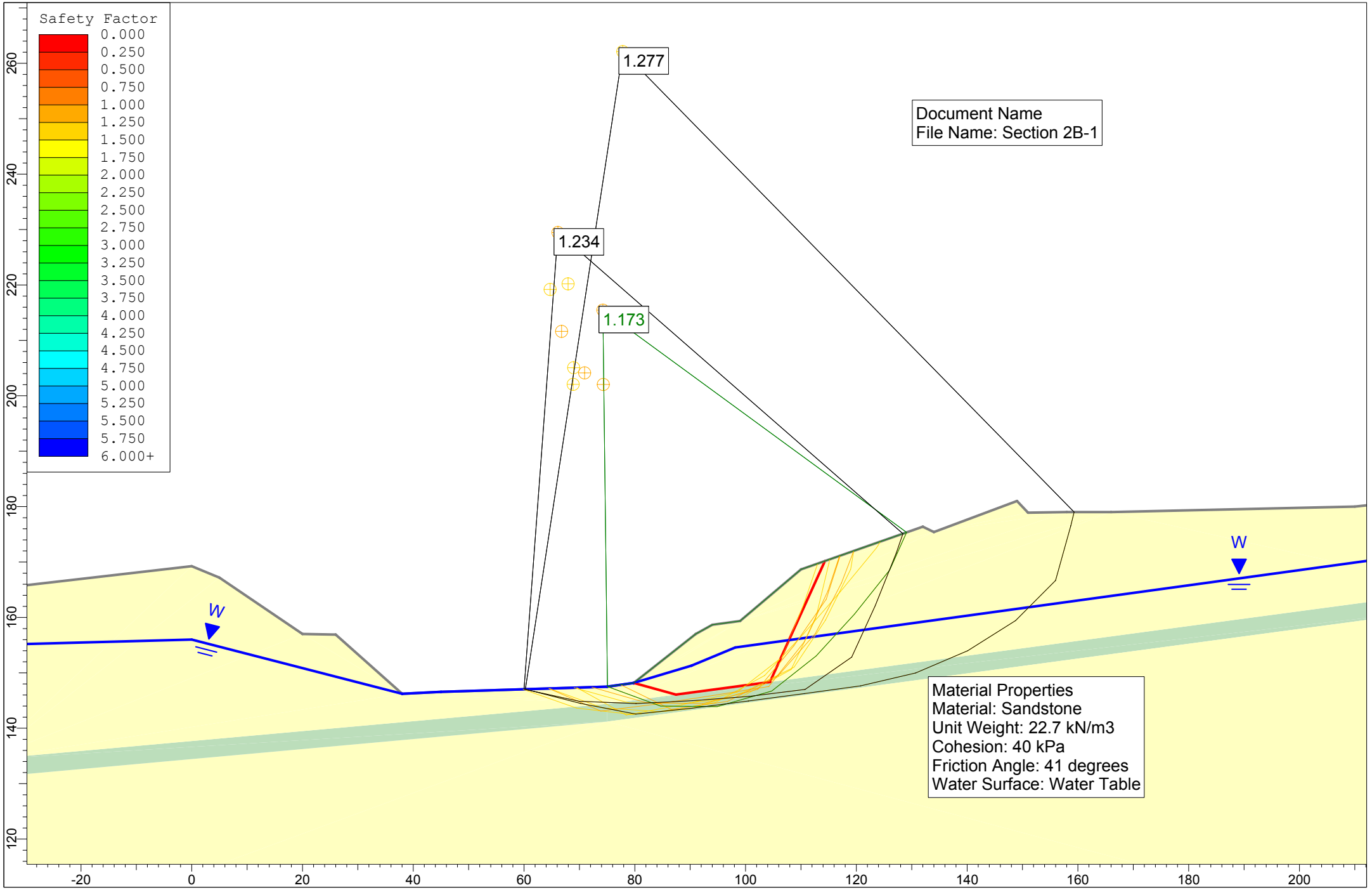
Additional stability analysis of the overall stability of the northern slope of Q3 was undertaken to cover the various stages to develop the quarry for lodge development. The analysis was undertaken using Rocscience Inc. 2D limit equilibrium slope stability for soil and rock slopes program 'Slide' version 5.0. Analysis was undertaken using Bishop, Janbu and Morgenstern-price methods. The parameters used and results have been tabulated below.

Ref:	Overall FoS	FoS beyond Boundary	Comment
2B-1	1.173	1.277	Existing Q3 when dry in 2010
2C-1	1.275	1.388	Existing Q3 when flooded to 156m AOD in 2018
2D	0.999	1.132	As 2C-1 Sandstone reduced to 10kPa
2E 1	1.248	1.364	Existing Q3 WL reduced to 153m AOD
2F-1	1.099	1.309	WL reduced to 153m & bench to 155m AOD
2G-1	1.284	1.414	WL raised to 154m AOD with gravel part installed
2H-1 ~~2F-1~~	1.312	1.418	Gravel face fully installed

Analysis 2D was undertaken to evaluate the sensitivity to sandstone weakening. The analysis found that provided fracture planes had a cohesive shear shrength in excess of 10kPa the overall slope remains stable. In the remaining analysis a cohesion of 40kPa was used.

Analysis was also undertaken to evaluate the influence of the various changes in lake level being proposed. The analysis shows how by lowering lake level the stability of the slope reduces, however the 2F-1 analysis confirmed that even without the north face being covered stability is retained. However, as proposed by installing the gravel slope below 155m AODstability can be increased above 1.3.

Soil Units	Colour	Unit weight kN/m3	Cohesion kN/m2	Phi degrees
Sandy Gravel	orange	18	1	40
Tailings	brown	14	1	28
Sandstone	yellow	22.7	40 (1)	41
Shale	green	22	1	12.5
Note: (1) Cohesion reduced to 10kPa in analysis 2D				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Friction Angle: 41 degrees
Water Surface: Water Table
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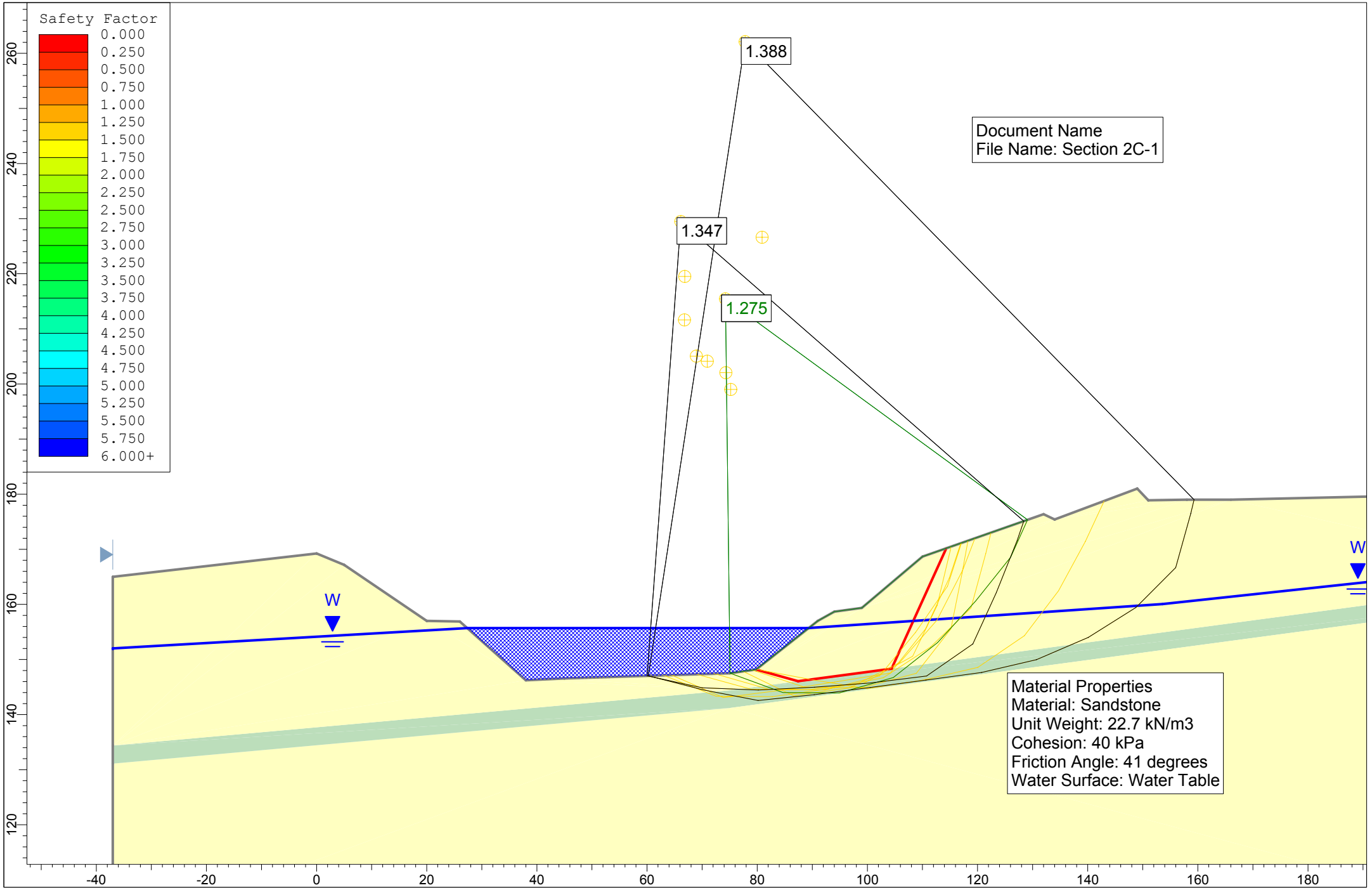
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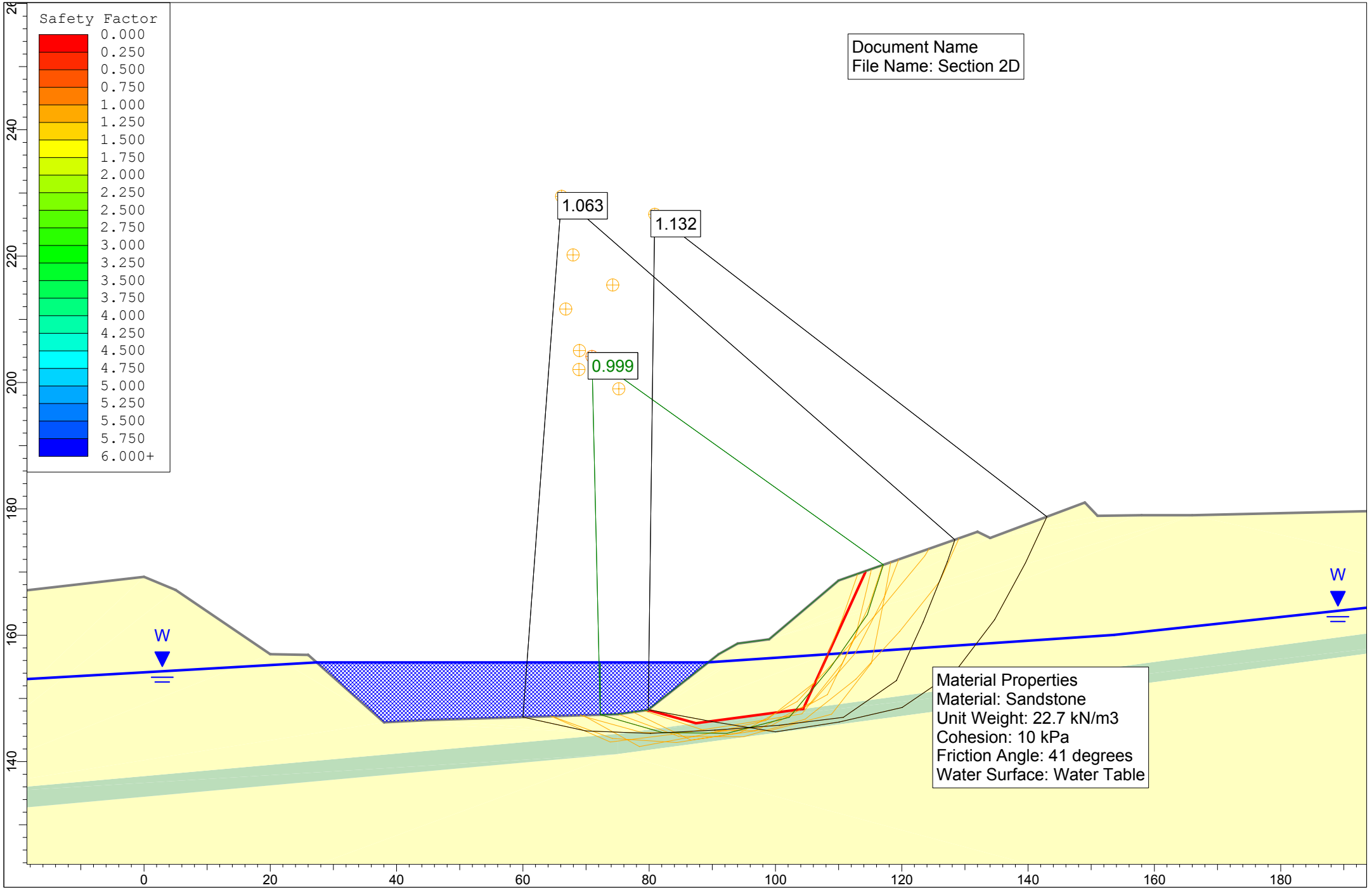
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Unit Weight: 22.7 kN/m3
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Water Surface: Water Table
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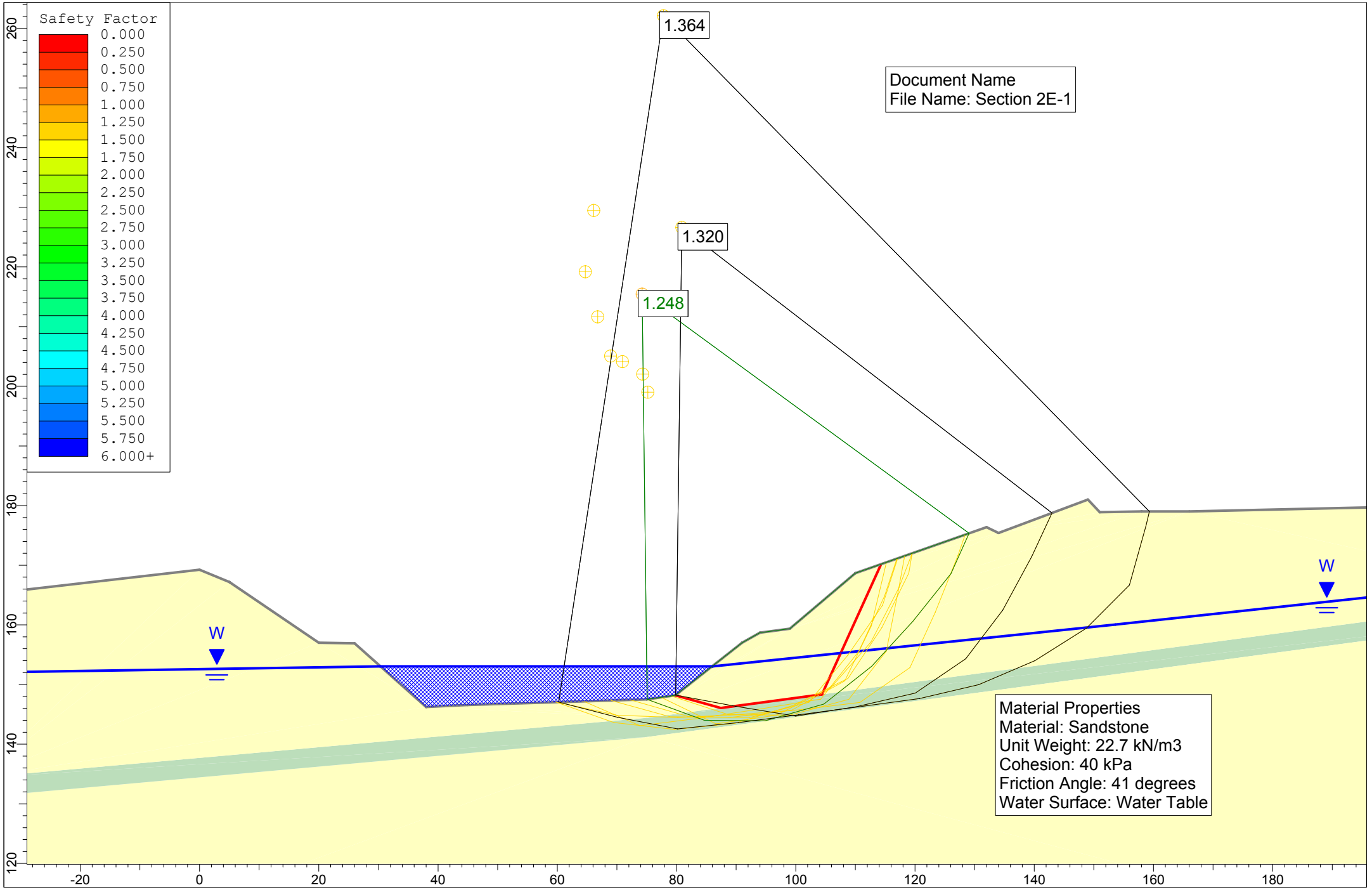
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Friction Angle: 41 degrees
Water Surface: Water Table
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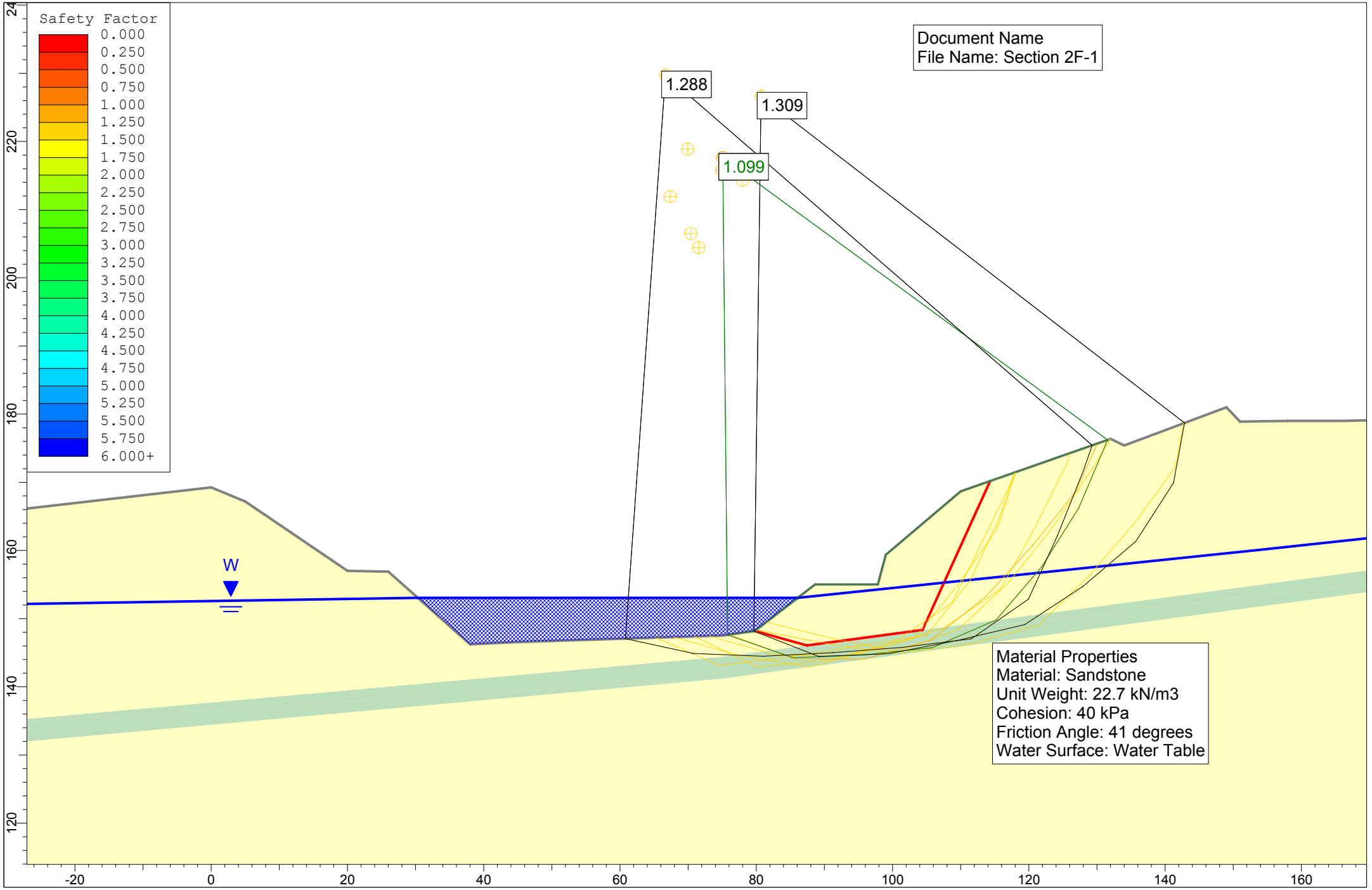
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Cohesion: 40 kPa
Friction Angle: 41 degrees
Water Surface: Water Table
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180
160
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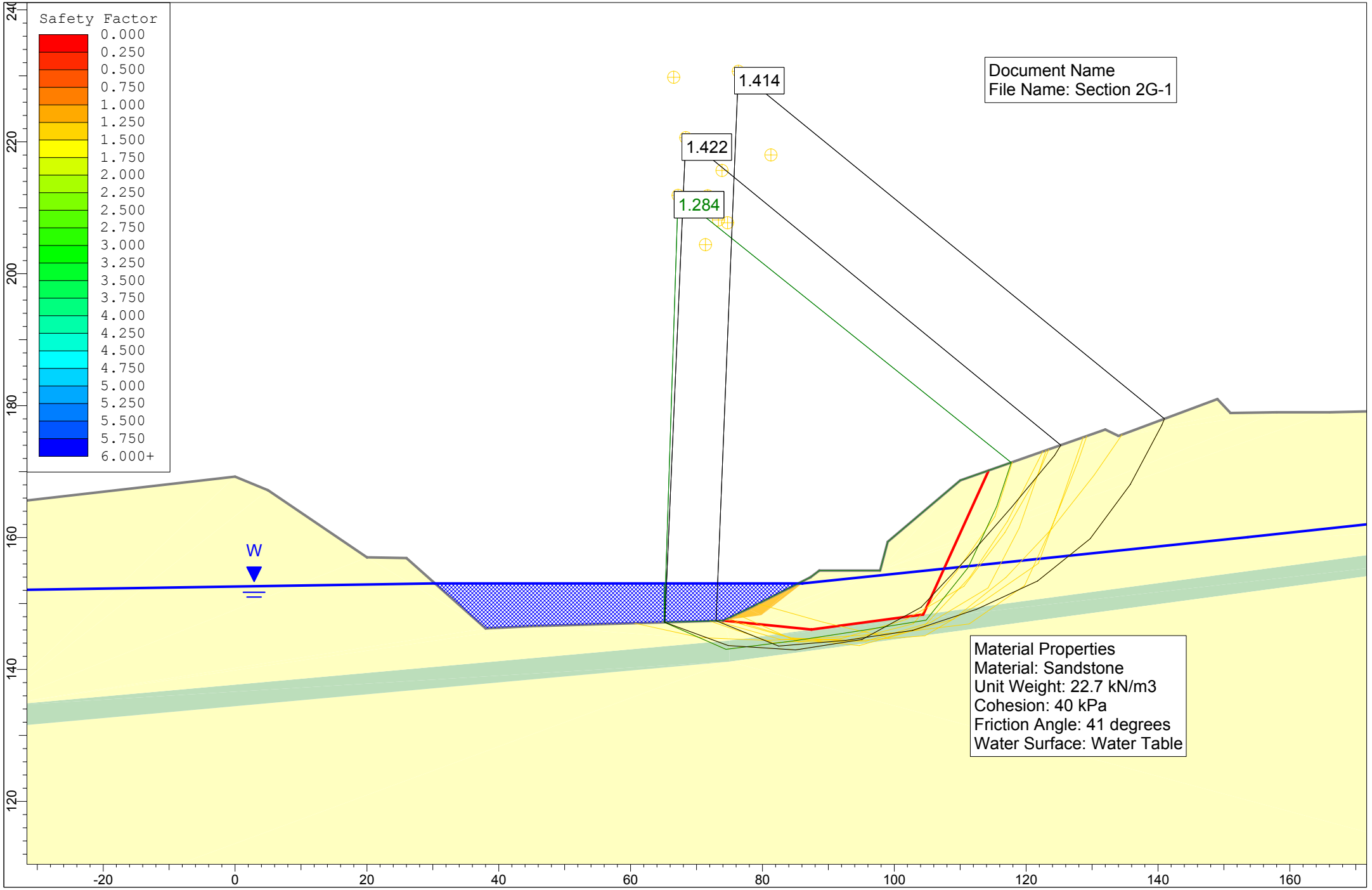
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6.000+
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Material Properties
Material: Sandstone
Unit Weight: 22.7 kN/m3
Cohesion: 40 kPa
Friction Angle: 41 degrees
Water Surface: Water Table
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40
60
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100
120
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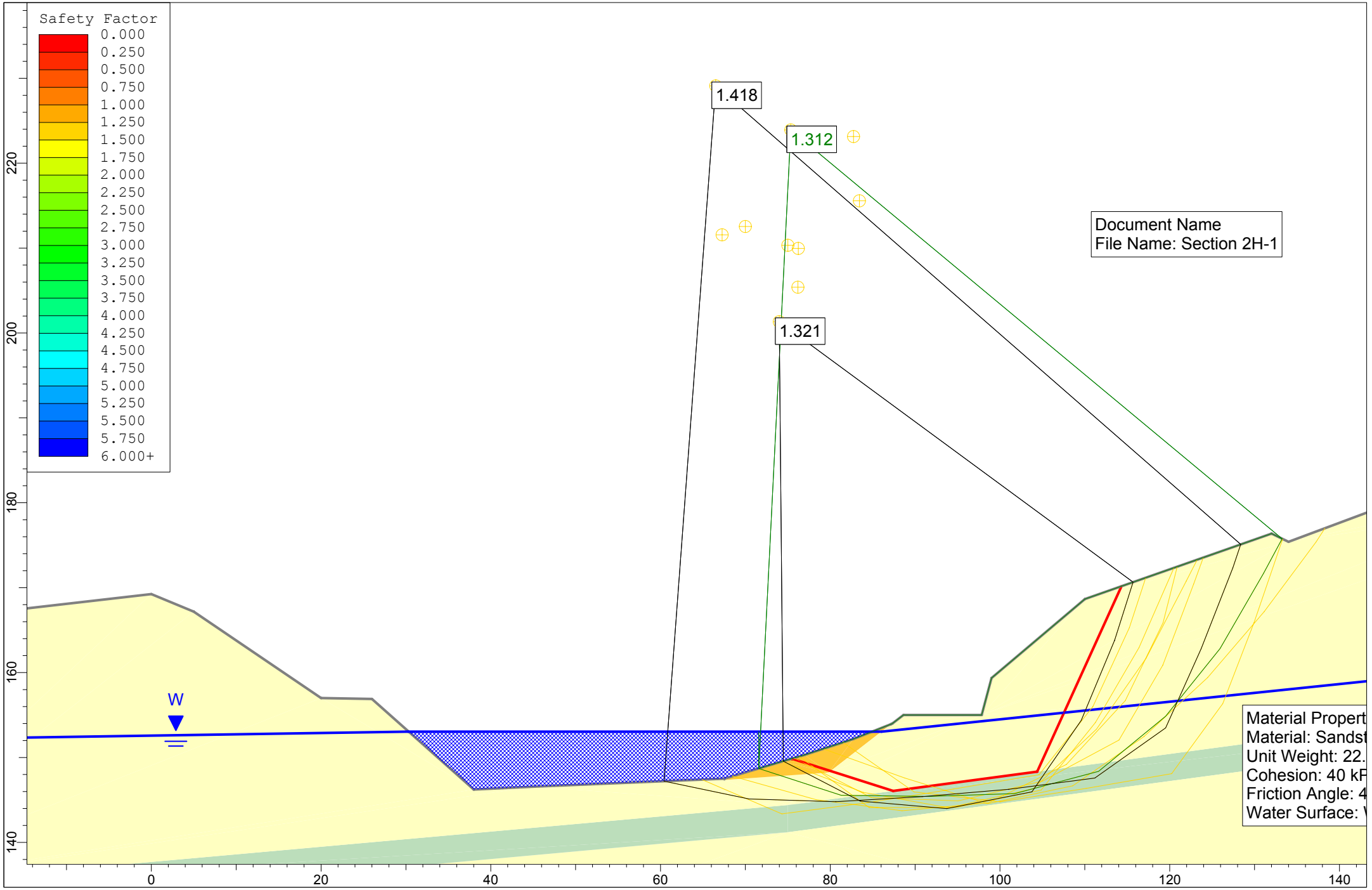
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1.321
Document Name
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Material Propert
Material: Sandst
Unit Weight: 22.
Cohesion: 40 kP
Friction Angle: 4
Water Surface:
220
200
180
160
140
0
20
40
60
80
100
120
140

APPENDIX C

Conceptual Model
From
418040EA March 2011

Number	Potential Hazard	Potential Source	Potential Pathway	Receptor	Current anticipated risk (1) *	Comment	Action	Anticipated risk after action *
1	Acidic Tailings	Lagoon L4 1st stage	Direct contact	Site users	Very Low / 100%	Due to depth no risk	No further action required	Very Low
2	Acidic Groundwater (leached)	Lagoon L4 1st stage	Through the ground	Groundwater	Low / 100%	Further investigation required	Dependent on SI findings	Low
3	Acidic Groundwater (leached)	Lagoon L4 1st stage	Through the ground	Proposed Lake	Moderate / Low / 100%	Further investigation required	Dependent on SI findings	Low
4	Methane / Carbon Dioxide	Buried vegetation between layers and cap (3 years growth)	Through the ground	Site users	Low / 100%	Monitoring required	Dependent on SI findings	Low
6	Capping material - Reject product	Lagoon L4 1st stage	Direct contact	Site users	Very Low / 100%	Due to depth no risk	No further action required	Very Low
5	Landfill gas - Methane dipping mixture	Lagoon L4 1st stage	Through the ground	Site users	Moderate / 100%	Monitoring required	Dependent on SI findings	Low
7	Acidic Tailings	Lagoon L5	Direct contact	Site users	Very Low / 100%	Due to depth no risk	No further action required	Very Low
8	Acidic Groundwater (leached)	Lagoon L5	Through the ground	Groundwater	Low / 100%	Further investigation required	Dependent on SI findings	Low
9	Acidic Groundwater (leached)	Lagoon L5	Through the ground	Proposed Lake	Moderate / Low / 100%	Further investigation required	Dependent on SI findings	Low
11	Methane / Carbon Dioxide	Buried vegetation between layers and cap (3 years growth)	Through the ground	Site users	Moderate / 100%	Monitoring required	Dependent on SI findings	Low
17	Acidic water	Lagoon L5	Direct contact	Site users	Low / 100%	Continued monitoring required	Dependent on SI findings	Low
12	Capping material - Reject product	Lagoon L5	Direct contact	Site users	Low / 100%	Further investigation required	Dependent on SI findings	Low
13	Acidic Tailings	Lagoon L4 2nd stage	Direct contact	Site users	Moderate / Low 100%	When capped will be of no risk	No further action required	Low
14	Acidic Groundwater (leached)	Lagoon L4 2nd stage	Through the ground	Groundwater	Low / 100%	Further assessment required	Dependent on SI findings	Low
15	Acidic Groundwater (leached)	Lagoon L4 2nd stage	Through the ground	Proposed Lake	Moderate / Low 100%	Further investigation required	Dependent on SI findings	Low
16	Acidic water	Lagoon L4 2nd stage	Direct contact	Site users	Low / 100%	Continued monitoring required	Dependent on SI findings	Low
17	Acidic water	Lagoon L4 2nd stage	Through the ground	Groundwater	Low / 100%	Continued monitoring required	Dependent on SI findings	Low
18	Acidic water	Lagoon L4 2nd stage	Through the ground	Proposed Lake	Low / 100%	Continued monitoring required	Dependent on SI findings	Low

(1) Anticipated risk over percentage site area

Abbeydale

CONCEPTUAL MODEL TABLE

Client Lever Leisure

Project Moneystone Quarry, Oakamoor

Job No 418040

Area Quarry 1 (East & West) Table 1

Number	Potential Hazard	Potential Source	Potential Pathway	Receptor	Current anticipated risk (1) *	Comment	Action	Anticipated risk after action *
19	Acidic Tailings	Lagoon L6	Direct contact	Site users	Very Low / 100%	Due to depth bgl no risk	No further action required	Very Low
20	Acidic Groundwater (perched)	Lagoon L6	Through the ground	Groundwater	Low / 100%	Further investigation required	Dependent on SI findings	Low
21	Acidic Groundwater (perched)	Lagoon L6	Through the ground	Proposed Lake	Moderate / 100%	Further investigation required	Dependent on SI findings	Low
22	Methane / Carbon dioxide	Buried vegetation between tailings and cap (3 years growth)	Through the ground	Site users	Low / 100 %	Monitoring required	Dependent on SI findings	Low
23	Capping material - Report product	Surface of Lagoon L6	Direct contact	Site users	Low / 100%	Further investigation required	Dependent on SI findings	Low
24	High Alkaline	Surface of Lagoon L6	Direct contact	Site users	High / 25%	Further investigation required	Dependent on SI findings	Low
25	High Acid / Alkaline	Flume adjacent to L7	Direct contact	Site users	High / 25%	Further investigation required	Dependent on SI findings	Low
26	High Acid / Alkaline	Flume adjacent to L7	Direct contact	Construction workers	High / 25%	Further investigation required	Dependent on SI findings	Low
27	Metals / Organics	Tip T3	Direct contact	Site users	Low / 25%	Further investigation required	Dependent on SI findings	Low
28	Acidic Tailings	Lagoon L7	Direct contact	Site users	Moderate / 100%	When capped with solid material no risk	No further action required	Low
29	Acidic Groundwater (perched)	Lagoon L7	Through the ground	Groundwater	Low / 100%	Monitoring required	Dependent on SI findings	Low
30	Acidic Groundwater (perched)	Lagoon L7	Fracture flow	Proposed Lake	Low / 100%	Monitoring required	Dependent on SI findings	Low
31	Acidic water (surface)	Lagoon L7	Direct contact	Site users	Moderate / 100%	Continued monitoring required	Dependent on SI findings	Low
32	Acidic water (surface)	Lagoon L7	Fracture flow	Proposed Lake	Moderate / Low 100%	Continued monitoring required	Dependent on SI findings	Low
33	Acidic water (surface)	Lagoon L7	Fracture flow	Groundwater	Low / 100%	Continued monitoring required	Dependent on SI findings	Low
34	Metals / Organics	Tip T4	Direct contact	Site users	Low / 25%	Further investigation required	Dependent on SI findings	Low

* Anticipated risk over percentage site area

Abbeydale

Abbeydale Street Mill [illegible]

CONCEPTUAL MODEL TABLE

Client : Faver Leisure

Project : Moneystone Quarry, Oakamoor

Job No : 415040

Area : Quarry 2 (East & West)

Table 2

Number	Potential Hazard	Potential Source	Potential Pathway	Receptor	Current anticipated risk (1) *	Comment	Action	Anticipated risk after action *
35	Acidic Tailings	Lagoon L8	Direct contact	Site users	Very Low / 100%	Pathway broken once SS filled with water	Monitor pH of lake	Very Low
36	Acidic Tailings	Lagoon L8	Mixing	Proposed Lake	Moderate / 100%	Site investigation required	Dependent on SI findings	Low
37	Acidic Groundwater (perched)	Lagoon L8	Through the ground	Groundwater	Low / 100%	Monitoring required	Dependent on SI findings	Low
38	Acidic Groundwater (perched)	Lagoon L8	Mixing	Proposed Lake	Moderate / Low / 100%	Continued monitoring required	Monitor pH of lake	Low
39	Acidic Groundwater (perched)	Lagoon L8	Through the ground	SSSI	Low / 50%	Continued monitoring required	Dependent on SI findings	Low
40	Acidic water (surface)	Lagoon L8	Direct contact	Site users	Moderate / 100%	Continued monitoring required	Dependent on SI findings	Low
41	Acidic water (surface)	Lagoon L8	Through the ground	Groundwater	Low / 100%	Continued monitoring required	Dependent on SI findings	Low
42	Acidic water (surface)	Lagoon L8	Through the ground	SSSI	Low / 100%	Continued monitoring required	Dependent on SI findings	Low
43	Acidic Groundwater	Lagoon L7	Fracture flow	Proposed Lake	Moderate / 100%	Continued monitoring required	Monitor pH of lake	Low

* Anticipated risk over percentage site area

Abbeydale

4 North Street Ilkley Tel 01943 [illegible]

CONCEPTUAL MODEL TABLE

Client : Lever Leisure

Project Moneystone Quarry, Oakamoor

Job No 418040

Area : Quarry 3

Table 3

Number	Potential Hazard	Potential Source	Pathway	Receptor	Current/Applied risk (1)	Comment	Action	Anticipated risk after action
44	[illegible]	Above Ground Fuel Tank Bunkers	[illegible]	Site users	Moderate / Low (1)	[illegible]	Dependant on Strategy	low
45	[illegible]	Above Ground Fuel Tank Bowser	Inhalation of vapour (current)	Site users	Moderate / Low (1)	Site management required	Dependant on Strategy	low
46	[illegible]	Above Ground Fuel Tank Contents	Through Pathway	Groundwater	Low (2)	Groundwater monitoring required	Dependant on Strategy	low
47	[illegible]	Pipelines	[illegible]	Site users	Moderate / Low (1)	Site management required	Dependant on Strategy	low
48	[illegible]	Pipelines	Inhalation of vapour (current)	Site users	Moderate / Low (1)	Site management required	Dependant on Strategy	low
49	[illegible]	Pipelines	Through Pathway	Groundwater	Moderate / Low (2)	Groundwater monitoring required	Dependant on Strategy	low
50	[illegible]	Contaminated soils (generally beneath)	Through Pathway	Groundwater	Moderate / Low (2)	Groundwater monitoring required	Dependant on Strategy	low
51	Acid (sludge) leakage	Acid Tanks (current)	Direct contact	Site users	Low (2)	Site management required	Dependant on Strategy	low
52	Acid (sludge) leakage	Acid Tanks (current)	Through Pathway	Groundwater	Moderate / Low (2)	Groundwater monitoring required	Dependant on Strategy	low
53	Acid (sludge) leakage	Acid Tanks (former)	Through Pathway	Groundwater	Moderate / Low (2)	Groundwater monitoring required	Dependant on Strategy	low
54	Acid leakage / spillage	Acid Tanks (former)	Through Pathway	Users (D & I)	Moderate / Low (2)	Monitoring required	Dependant on Strategy	low
55	Acid / alkali balance	Acid bunded pit	Through Pathway	Groundwater	Low (2)	Groundwater monitoring required	Dependant on Strategy	low
56	Acid / alkali balance	Acid / alkali pit	Through Pathway	Users (D & I)	Low (2)	Monitoring required	Dependant on Strategy	low
57	Heavy Metals	Made Ground	Direct contact	Site users	Low (2)	Site management required	Dependant on Strategy	low
58	Hydrocarbons	Made Ground	Through Pathway	Groundwater	Moderate / Low (2)	Groundwater monitoring required	Dependant on Strategy	low
59	Hydrocarbons	Made Ground	Through Pathway	Users (D & I)	Moderate / Low (2)	Groundwater monitoring required	Dependant on Strategy	low
60	Acids	Foundations / Ballast	Direct contact	Site users	Low (2)	Site management required	Dependant on Strategy	low
61	Various	Dumping / Made Ground	Through Pathway	Groundwater	Very Low (2)	Site investigation necessary	No further action required	Very Low
62	Asbestos	Material Wrapping around buildings	Inhalation of dust	Site users	Moderate / Low (1)	Site management required	Dependant on Strategy	low
63	Asbestos	Demolition of old buildings	Inhalation of dust	Construction workers	Moderate / Low (1)	Site management required	Dependant on Strategy	low
64	Oxidation of coal	Fire (if occurring now)	Inhalation of dust / vapour	Construction workers	Moderate / Low (1)	Monitoring required	Appropriate PPE required	Low
65	Acids	Old Storage Tanks	Direct contact	Construction workers	Very Low (1)	Site investigation necessary	No further action required	Very low
66	Asbestos	Demo / Soils Piles	Direct contact	Construction workers	Very Low (1)	Site investigation necessary	No further action required	Very low

(1) Anticipated risk with remedial solutions

Ashleydale

CONCEPTUAL MODEL TABLE

Client Leary Leisure

Project Morecambe Dolphin Oakenmoor

Job No 47/046

Area Processing Area

Table 4

Number	Potential Hazard	Potential Source	Potential Pathway	Receptor	Current anticipated risk [1] *	Comment	Action	Anticipated risk after action *
S7	Acidic Tailings	Lagoon L1 & L2	Direct contact	Site users	Very Low (<5%)	Due to depth of material	No further action required	Very Low
S8	Acidic Groundwater (perched)	Lagoon L1 & L2	Through the ground	Rivers (UK)	Moderate / Low (<25%)	Site investigation required	Dependent on SI findings	low
S9	Acidic Groundwater (perched)	Lagoon L1 & L2	Through the ground	Groundwater	Low (<20%)	Site investigation required	Dependent on SI findings	low
S10	Acidic water (surface)	Settlement Ponds	Channel flow	River Channel	Low (<20%)	Continued monitoring required	Dependent on SI findings	low
S11	Acidic Tailings	Lagoon L2	Direct contact	Site users	Very Low (<20%)	Due to depth of material	No further action required	Very low
S12	Acidic Groundwater (perched)	Lagoon L2	Through the ground	Rivers (UK)	Moderate / Low (<25%)	Site investigation required	Dependent on SI findings	Low
S13	Acidic Groundwater (perched)	Lagoon L2	Through the ground	Groundwater	Low (<20%)	Site investigation required	Dependent on SI findings	Low
S14	Metals / Organics	Tip T2	Direct contact	Site users	Very Low (<5%)	Due to depth of material	No further action required	Very Low
S15	Leachable metals	Tip T2	Through the ground	Rivers (UK)	Low (<20%)	Monitoring required	Dependent on SI findings	low
S16	Heavy Metals	Castle Pond	Direct contact	Site users	Very Low (<5%)	Due to depth of material	No further action required	Very Low
S17	Leachable metals	Castle Pond	Through the ground	Groundwater	Moderate (<25%)	Monitoring required	Dependent on SI findings	Low
S18	Heavy Metals	Railway Sidings	Direct contact	Site users	Very Low (<5%)	Site investigation not necessary	No further action required	Very Low
S19	Leachable metals	Railway Sidings	Through the ground	River Channel	Low (<20%)	Monitoring required	Dependent on SI findings	low
S20	Asbestos	Railway Sidings	Inhalation of dust (outdoor)	Site users	Low (<20%)	Site investigation not necessary	No further action required	Low
S21	Organics	Railway Sidings	Ingestion of vapour (outdoor)	Site users	Very Low (<5%)	Site investigation not necessary	No further action required	Very Low

* Anticipated risk as percentage site area

Atkinsrealis

CONCEPTUAL MODEL TABLE

Client: Lawn Leisure
Project: Moneystone Quarry, Oakamoor
Job No: 418343
Area: South of Processing Area

Table 5

Number	Potential Hazard	Potential Source	Potential Pathway	Receptor	Current/anticipated risk [1] *	Comment	Action	Anticipated risk after action *
02	Metals	None currently identified	Direct contact	Site users	Very Low (<1%)	No risk at levels present	No further action required	Very Low
03	Metals	None currently identified	Through the ground	Groundwater	Very Low (<10%)	No risk at levels present	No further action required	Very Low
04	Organics	None currently identified	Inhalation of vapours (indoor)	Site users	Very Low (<1%)	No risk at levels present	No further action required	Very Low
05	Organics	None currently identified	Direct contact	Site users	Very Low (<10%)	No risk at levels present	No further action required	Very Low
06	Made Ground Gas	Poor quality	Through the ground	Site users	Low (<10%)	Monitoring recommended within the quarry	Dependent on quarry monitoring	Very Low

* Anticipated risk from remedial site area

Aubreydale

CONCEPTUAL MODEL TABLE

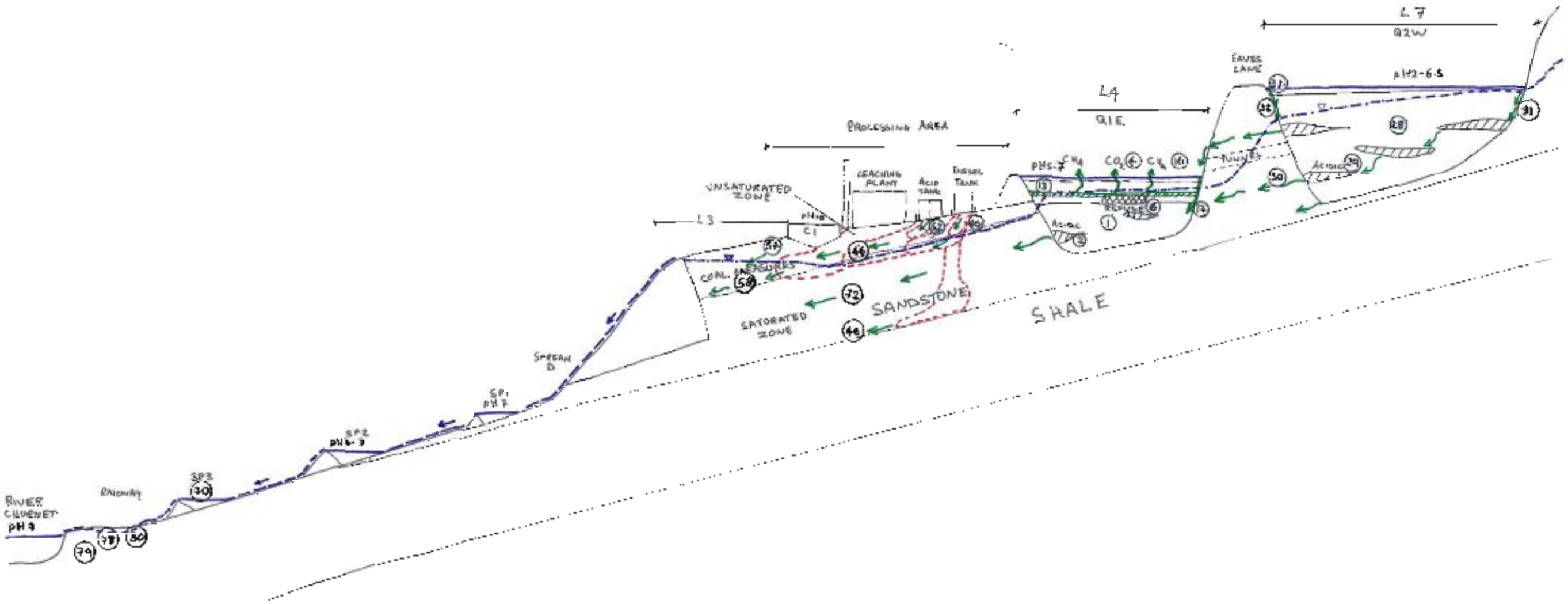
Client Lawn Leisure

Project Moreystone Quarry, Oakamoor

Job No 418040

Area Eastern & Western Area

Table 6



Abbeydale
Building Investment Consultants

4 Neville Street, Wakefield WF1 5EF Tel: 01924 376622 01924 376661

Notes: > NOT TO SCALE. This model is schematic only and does not reflect the specific ground conditions identified on or off the site.
> See Table 1, 2, 4 & 5 Conceptual Model Table

CONCEPTUAL MODEL 1

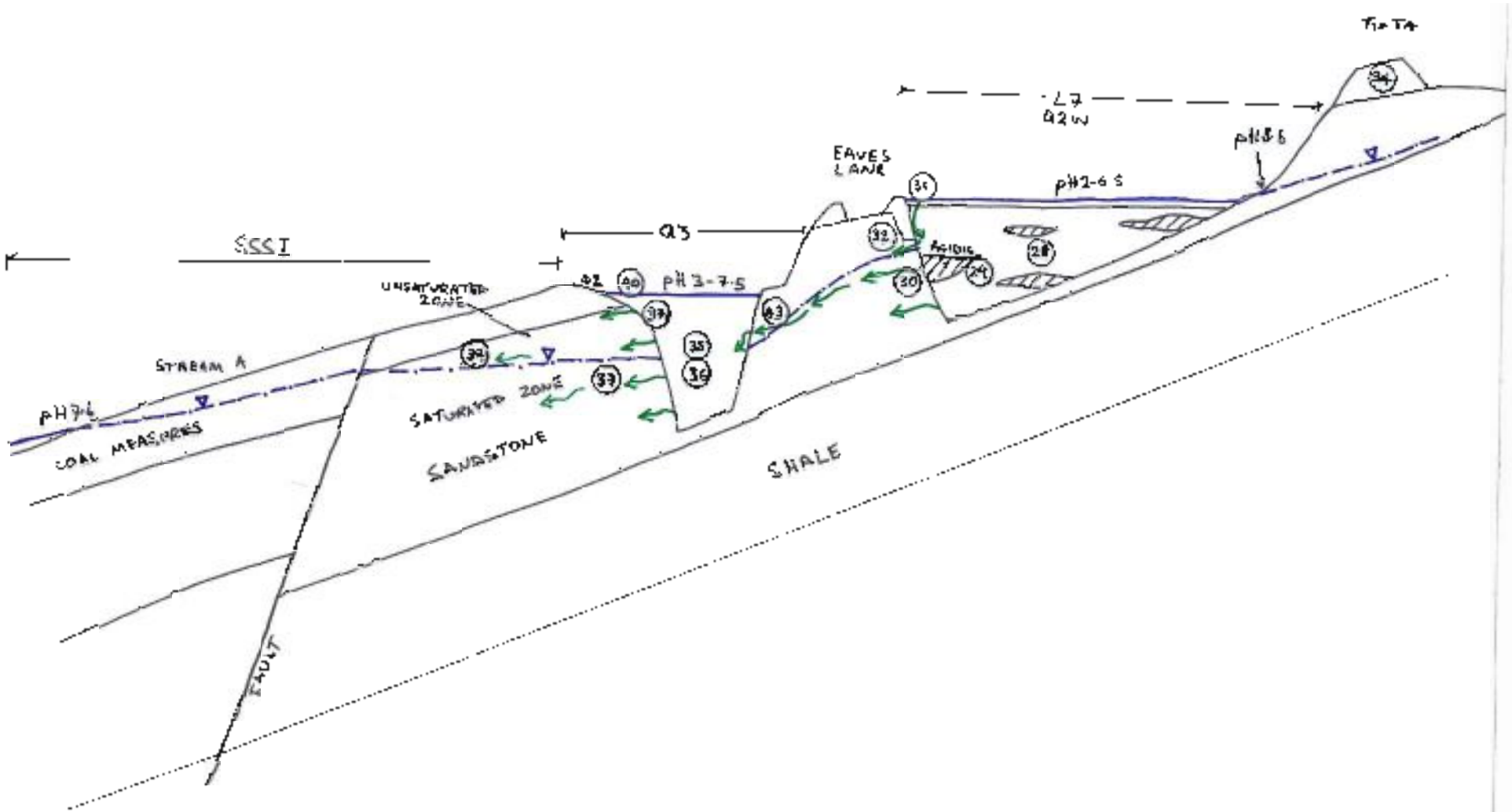
Client: Laver Leisure

Project: Moneystone Quarry, Oakamoor

Number: 418040

Fig 5

MODEL 418040 GPL ABEC TEMPLATE GDT 8/2/11



Abbeydale

4 Neville Street, Wakefield WF1 5EF Tel: (01924 376622 01924 376661

Notes: * NOT TO SCALE. This model is schematic only and does not reflect the specific ground conditions identified on or off the site
* See Table 2 & 3 Conceptual Model Table

CONCEPTUAL MODEL 2

Client: Laver Leisure

Project: Moneystone Quarry, Oakamoor

Number: 418040

Fig 6