

TP ID	Test Depth (m)	Date & Time of Test	Read Time	Ambient Soil Temperature (°C)	Strata Type	Ground-water Level (m)	NMC (%)	Thermal Conductivity (W/K m)	Thermal Resistivity (K m/W)	Remarks
TP01	1.1	29.11/23	150	6.9	SAND & GRAVEL	1.1		1.079	0.9267841	
TP08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP10	1.1	24.11.23	150	6.9	Gravelly SAND	1.75m	N/A	1.826	0.5476451	
TP12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP15	1.1	27.11.23	150	7.3	PEAT	1.75m		1.325	0.754717	
TP19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP26	1.1	24.11.23	150	7.03	PEAT	0.30m		1.251	0.7993605	
TP27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP28	1.1	21.11.23	150	7.1	SAND & GRAVEL	2.90m	6.4	5.232	0.1911315	
TP30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material
TP34	1	21.11.23	150	7.05	SAND & GRAVEL	1.80m		0.717	1.3947001	
TP37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Unsuitable material

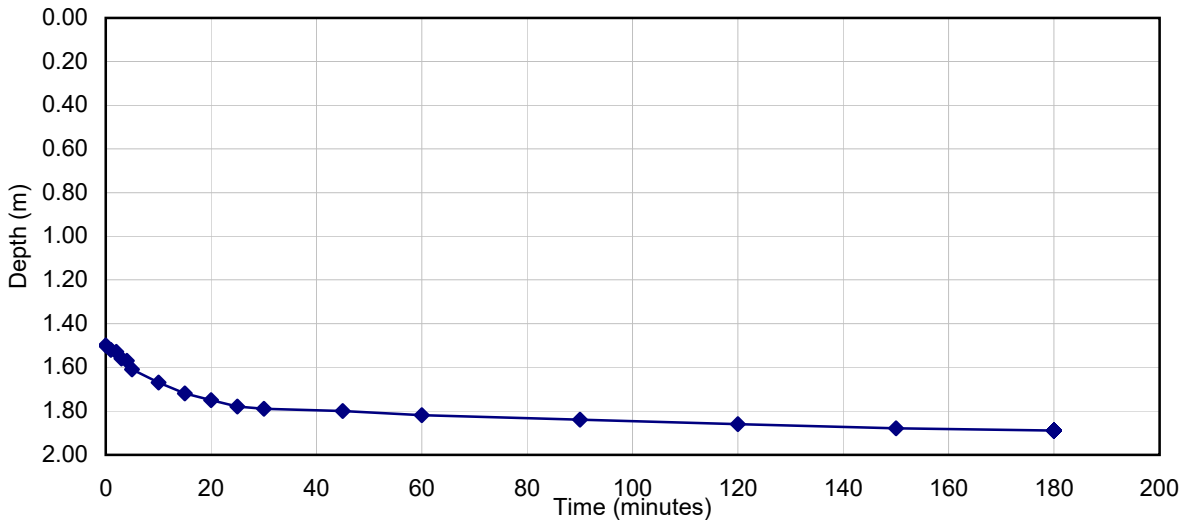
Version 007 - 04/10/2023
1960 - Soakaway TP28 - A15075-1 13.12.23 01.xls
62 Rochsolloch Road, Airdrie, ML6 9BG
Lab Project No A15075-1 : 12/13/2023 16:27:24



Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
Client	SSEN Transmission	Test Pit No	TP28
Engineer	Jacobs	Test Run No	1
		Date of Test	13.12.23

Time (minute)	Depth to Water (m)
0	1.50
1	1.52
2	1.53
3	1.56
4	1.57
5	1.61
10	1.67
15	1.72
20	1.75
25	1.78
30	1.79
45	1.80
60	1.82
90	1.84
120	1.86
150	1.88
180	1.89

Weather Conditions		
Dry, cold, clear		
Non Engineering Strata Description		
0.00-0.40: PEAT 0.40-1.20: SAND & GRAVEL 1.20-2.50: Sandy GRAVEL with cobbles		
Test Pit Dimensions		
Length	m	2.40
Width	m	0.80
Depth	m	2.50
Test Parameters		
Maximum Effective Depth	m	1.50
75% Effective Depth	m	1.75
25 % Effective Depth	m	2.25
Effective Storage Volume	m ³	0.96
Surface Area a _{p50}	m ²	5.12
Time for 75%	min	~
Time for 25%	min	~
t _{p75-25}	min	~
Soil Infiltration Rate		
INDETERMINATE		
Comments		
Test abandoned due to slow water outflow		



Originator	Checked & Approved	SOAKAWAY BRE 365	Fig No:  D2
FP	 13/12/2023		Sheet 1 of 1

				Site: LT521 FASNAKYLE 400KV SUBSTATION								Contract No: 26560		
				Client: SSEN Transmission Engineer: Jacobs								Water level measurements taken from ground level.		
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)					
BH02	324.21		30/01/24 09:00	984	0.00	0.10	19.60	0.00	0.00	0.00	0.00	1.26	322.95	Dry, Overcast
	324.21		30/01/24 09:01		0.00	0.10	19.50	0.00	0.00					Dry, Overcast
	324.21		30/01/24 09:02		0.00	0.10	19.50	0.00	0.00					Dry, Overcast
	324.21		30/01/24 09:03		0.00	0.10	19.50	0.00	2.00					Dry, Overcast
	324.21		30/01/24 09:04		0.00	0.10	19.50	1.00	3.00					Dry, Overcast
	324.21		30/01/24 09:05		0.00	0.10	19.50	0.00	2.00					Dry, Overcast
	324.21		29/02/24 09:00	952	0.00	0.00	19.30	0.00	0.00	18.00	3.10	0.42	323.79	Overcast, raining
	324.21		29/02/24 09:01		0.00	0.00	19.00	0.00	1.00					Overcast, raining
	324.21		29/02/24 09:02		0.00	0.00	19.30	0.00	2.00					Overcast, raining
	324.21		29/02/24 09:03		0.00	0.00	19.20	0.00	1.00					Overcast, raining
	324.21		29/02/24 09:04		0.00	0.00	19.20	0.00	1.00					Overcast, raining
	324.21		29/02/24 09:05		0.00	0.00	19.10	0.00	0.00		2.90			Overcast, raining
	324.21		25/03/24 12:54	961	0.00	0.00	17.20	0.00	0.00	0.00	0.00	5.06	319.15	Overcast, occasional snow
	324.21		25/03/24 12:55		0.00	0.00	17.20	0.00	0.00					Overcast, occasional snow
	324.21		25/03/24 12:56		0.00	0.00	16.50	0.00	0.00					Overcast, occasional snow
	324.21		25/03/24 12:57		0.00	0.00	15.80	0.00	0.00					Overcast, occasional snow
	324.21		25/03/24 12:58		0.00	0.00	15.40	0.00	0.00					Overcast, occasional snow
	324.21		25/03/24 12:59		0.00	0.00	15.20	0.00	0.00					Overcast, occasional snow
	324.21		23/04/24 11:24	989	0.00	2.10	17.20	0.00	10.00	0.00	0.00	4.73	319.48	Dry, overcast and cool
	324.21		23/04/24 11:25		0.00	2.20	16.70	0.00	5.00					Dry, overcast and cool
	324.21		23/04/24 11:26		0.00	2.20	16.70	0.00	3.00					Dry, overcast and cool
	324.21		23/04/24 11:27		0.00	2.20	16.70	0.00	0.00					Dry, overcast and cool
	324.21		23/04/24 11:28		0.00	2.20	16.80	0.00	2.00					Dry, overcast and cool
	324.21		23/04/24 11:29		0.00	2.20	16.80	0.00	1.00					Dry, overcast and cool
BH04	325.02		01/02/24 09:00	987	0.00	0.00	19.20	0.00	0.00	0.00	0.40	0.43	324.59	Dry, Overcast
	325.02		01/02/24 09:01		0.00	0.00	19.30	0.00	0.00					Dry, Overcast
	325.02		01/02/24 09:02		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	325.02		01/02/24 09:03		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	325.02		01/02/24 09:04		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	325.02		01/02/24 09:05		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	325.02		29/02/24 09:00	952	0.00	0.00	19.30	0.00	0.00	0.00	0.00	0.42	324.60	Overcast, raining
	325.02		29/02/24 09:01		0.00	0.00	19.20	0.00	1.00					Overcast, raining
	325.02		29/02/24 09:02		0.00	0.00	19.30	0.00	0.00					Overcast, raining
	325.02		29/02/24 09:03		0.00	0.00	19.30	0.00	1.00					Overcast, raining
	325.02		29/02/24 09:04		0.00	0.00	19.20	0.00	0.00					Overcast, raining
	325.02		29/02/24 09:05		0.00	0.00	19.20	0.00	0.00		0.00			Overcast, raining
	325.02		25/03/24 13:49	961	0.00	0.00	18.10	0.00	0.00	-3.00	-0.40	0.54	324.48	Overcast, occasional snow
	325.02		25/03/24 13:50		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	325.02		25/03/24 13:51		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	325.02		25/03/24 13:52		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	325.02		25/03/24 13:53		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow
	325.02		25/03/24 13:54		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow
	325.02		23/04/24 12:14	988	0.00	1.40	19.00	0.00	0.00	0.00	0.00	0.58	324.44	Dry, overcast and cool
	325.02		23/04/24 12:15		0.00	2.00	17.10	0.00	0.00					Dry, overcast and cool
Originator		Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES												Fig No:
JMcM														
Chk & App	Status													
FMR	Final											 E2 Sheet 1 of 7		

				Site: LT521 FASNAKYLE 400KV SUBSTATION								Contract No: 26560			
				Client: SSEN Transmission Engineer: Jacobs								Water level measurements taken from ground level.			
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks	
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)						
BH04	325.02		23/04/24 12:16		0.00	2.00	17.30	0.00	0.00					Dry, overcast and cool	
	325.02		23/04/24 12:17		0.00	2.00	17.30	0.00	0.00					Dry, overcast and cool	
	325.02		23/04/24 12:18		0.00	1.90	17.40	0.00	0.00					Dry, overcast and cool	
	325.02		23/04/24 12:19		0.00	1.90	17.50	0.00	0.00					Dry, overcast and cool	
BH08	334.07		12/01/23 00:00									0.00	334.07		
	334.07		15/12/23 00:00									0.00	334.07		
	334.07		19/12/23 00:00									0.00	334.07		
	334.07		30/01/24 00:00									0.30	333.77	Water level 0.30m above GL	
	334.07		29/02/24 09:00									0.30	333.77	Water level 0.30m above GL	
	334.07		25/03/24 12:40									0.20	333.87	Water level 0.20m above GL	
	334.07		23/04/24 11:09									0.30	333.77	Water level 0.30m above GL	
	330.59		19/12/23 00:00									4.02	326.57		
BH11	330.59		11/01/24 00:00									4.51	326.08		
	330.59		30/01/24 09:00	984	0.00	0.00	18.90	0.00	0.00	0.00	0.30	3.55	327.04	Dry, Overcast	
	330.59		30/01/24 09:01		0.00	0.00	19.00	0.00	0.00					Dry, Overcast	
	330.59		30/01/24 09:02		0.00	0.00	19.00	0.00	1.00					Dry, Overcast	
	330.59		30/01/24 09:03		0.00	0.00	19.00	0.00	0.00					Dry, Overcast	
	330.59		30/01/24 09:04		0.00	0.00	18.90	0.00	0.00					Dry, Overcast	
	330.59		29/02/24 09:00	950	0.00	0.00	18.00	0.00	0.00	6.00	2.00	4.85	325.74	Overcast, raining	
	330.59		29/02/24 09:01		0.00	0.00	19.20	1.00	0.00					Overcast, raining	
	330.59		29/02/24 09:02		0.00	0.10	19.10	1.00	1.00					Overcast, raining	
	330.59		29/02/24 09:03		0.00	0.00	19.20	1.00	0.00					Overcast, raining	
	330.59		29/02/24 09:04		0.00	0.00	19.20	0.00	1.00					Overcast, raining	
	330.59		29/02/24 09:05		0.00	0.00	19.10	0.00	0.00		1.30			Overcast, raining	
	330.59		25/03/24 13:18	960	0.00	0.00	17.70	0.00	0.00	-2.00	-0.40	4.81	325.78	Overcast, occasional snow	
	330.59		25/03/24 13:19		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	330.59		25/03/24 13:20		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	330.59		25/03/24 13:21		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	330.59		25/03/24 13:22		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	330.59		25/03/24 13:23		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	BH14	330.59		23/04/24 11:46	988	0.00	1.60	18.20	0.00	0.00	0.00	0.00	4.44	326.15	Dry, overcast and cool
		330.59		23/04/24 11:47		0.00	2.20	16.40	0.00	0.00					Dry, overcast and cool
330.59			23/04/24 11:48		0.00	2.10	16.40	0.00	0.00					Dry, overcast and cool	
330.59			23/04/24 11:49		0.00	2.10	16.60	0.00	0.00					Dry, overcast and cool	
330.59			23/04/24 11:50		0.00	2.10	16.70	0.00	0.00					Dry, overcast and cool	
330.59			23/04/24 11:51		0.00	2.10	16.80	0.00	0.00					Dry, overcast and cool	
306.06			15/12/23 00:00									0.15	305.91		
306.06			19/12/23 00:00									0.11	305.95		
306.06			11/01/24 00:00									0.36	305.70		
306.06			31/01/24 09:00	962	0.00	0.00	19.30	0.00	0.00	0.00	0.00	0.27	305.79	Overcast, raining	
	306.06		31/01/24 09:01		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
	306.06		31/01/24 09:02		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	306.06		31/01/24 09:03		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	306.06		31/01/24 09:04		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
	306.06		31/01/24 09:04		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
Originator		Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES													
JMcM															
Status															
Chk & App	FMR	Final													Fig No: E2 Sheet 2 of 7
Chk & App															

				Site: LT521 FASNAKYLE 400KV SUBSTATION								Contract No: 26560			
				Client: SSEN Transmission Engineer: Jacobs								Water level measurements taken from ground level.			
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks	
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)						
BH14	306.06		31/01/24 09:05		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	306.06		28/02/24 09:00	961	0.00	0.00	19.30	0.00	1.00	0.00	0.00	0.22	305.84	Overcast, raining	
	306.06		28/02/24 09:01		0.00	0.10	19.50	0.00	0.00					Overcast, raining	
	306.06		28/02/24 09:02		0.00	0.10	19.50	0.00	0.00					Overcast, raining	
	306.06		28/02/24 09:03		0.00	0.10	19.50	0.00	1.00					Overcast, raining	
	306.06		28/02/24 09:04		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
	306.06		28/02/24 09:05		0.00	0.10	19.40	0.00	0.00		0.00			Overcast, raining	
	306.06		26/03/24 08:42	960	0.00	0.00	17.60	0.00	0.00	-2.00	-0.30	0.24	305.82	Overcast, occasional snow	
	306.06		26/03/24 08:43		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	306.06		26/03/24 08:44		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	306.06		26/03/24 08:45		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	306.06		26/03/24 08:46		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	306.06		26/03/24 08:47		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	306.06		22/04/24 16:48	997	0.00	0.40	15.00	0.00	0.00	0.00	0.00	0.27	305.79	Dry, sunny and mild	
	306.06		22/04/24 16:49		0.00	1.00	19.50	0.00	0.00					Dry, sunny and mild	
	306.06		22/04/24 16:50			1.10								Test terminated due to water ingress	
BH16	325.42		19/12/23 00:00									0.54	324.88		
	325.42		12/01/24 00:00									0.62	324.80		
	325.42		01/02/24 09:00	987	0.00	0.00	18.90	0.00	1.00	2.00	0.80	0.62	324.80	Dry, Overcast	
	325.42		01/02/24 09:01		0.00	0.00	19.20	0.00	1.00					Dry, Overcast	
	325.42		01/02/24 09:02		0.00	0.00	19.10	0.00	0.00					Dry, Overcast	
	325.42		01/02/24 09:03		0.00	0.00	19.10	0.00	0.00					Dry, Overcast	
	325.42		01/02/24 09:04		0.00	0.00	19.10	0.00	0.00					Dry, Overcast	
	325.42		01/02/24 09:05		0.00	0.00	19.10	0.00	0.00					Dry, Overcast	
	325.42		28/02/24 09:00	962	0.00	0.10	19.60	0.00	0.00	0.00	0.00	0.70	324.72	Overcast, raining	
	325.42		28/02/24 09:01		0.00	0.10	19.50	0.00	1.00					Overcast, raining	
	325.42		28/02/24 09:02		0.00	0.10	19.50	0.00	2.00					Overcast, raining	
	325.42		28/02/24 09:03		0.00	0.10	19.50	0.00	1.00					Overcast, raining	
	325.42		28/02/24 09:04		0.00	0.10	19.50	1.00	1.00					Overcast, raining	
	325.42		28/02/24 09:05		0.00	0.10	19.40	0.00	1.00		0.00			Overcast, raining	
	325.42		25/03/24 13:37	960	0.00	0.00	17.80	0.00	0.00	-4.00	-0.40	0.70	324.72	Overcast, occasional snow	
	325.42		25/03/24 13:38		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	325.42		25/03/24 13:39		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	325.42		25/03/24 13:40		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	325.42		25/03/24 13:41		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	325.42		25/03/24 13:42		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow	
	325.42		23/04/24 12:03	989	0.00	1.60	20.10	0.00	0.00	0.00	0.00	1.10	324.32	Dry, overcast and cool	
	325.42		23/04/24 12:04		0.00	2.10	17.40	0.00	0.00					Dry, overcast and cool	
	325.42		23/04/24 12:05		0.00	2.00	17.50	0.00	0.00					Dry, overcast and cool	
	325.42		23/04/24 12:06		0.00	2.00	17.60	0.00	0.00					Dry, overcast and cool	
	325.42		23/04/24 12:07		0.00	2.00	17.60	0.00	1.00					Dry, overcast and cool	
	325.42		23/04/24 12:08		0.00	2.00	17.70	0.00	0.00					Dry, overcast and cool	
BH18	316.75		08/12/23 00:00									1.95	314.80		
Originator		Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES													Fig No: E2 Sheet 3 of 7
Chk & App															
FMR															
JMcM		Status													
Final															

				Site: LT521 FASNAKYLE 400KV SUBSTATION								Contract No: 26560			
				Client: SSEN Transmission Engineer: Jacobs								* Water level measurements taken from ground level.			
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks	
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)						
BH18	316.75		15/12/23 00:00									1.98	314.77		
	316.75		19/12/23 00:00									1.96	314.79		
	316.75		11/01/24 00:00									2.00	314.75		
	316.75		31/01/24 09:00	962	0.00	0.10	19.40	0.00	1.00	0.00	0.00	0.50	316.25	Overcast, raining	
	316.75		31/01/24 09:01		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	316.75		31/01/24 09:02		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	316.75		31/01/24 09:03		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
	316.75		31/01/24 09:04		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
	316.75		31/01/24 09:05		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
	316.75		28/02/24 09:00	966	0.00	0.10	18.20	0.00	0.00	5.00	1.30	1.84	314.91	Overcast, raining	
	316.75		28/02/24 09:01		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
	316.75		28/02/24 09:02		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
	316.75		28/02/24 09:03		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
	316.75		28/02/24 09:04		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	316.75		28/02/24 09:05		0.00	0.10	19.30	0.00	0.00		1.30			Overcast, raining	
	316.75		26/03/24 08:59	958	0.00	0.00	17.80	0.00	0.00	-3.00	-0.40	1.87	314.88	Overcast, occasional snow	
	316.75		26/03/24 09:00		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	316.75		26/03/24 09:01		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	316.75		26/03/24 09:02		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	316.75		26/03/24 09:03		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
316.75		26/03/24 09:04		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow		
	316.75		22/04/24 09:00	992	0.00	0.60	19.60	0.00	0.00	-8.00	-2.10	1.59	315.16	Dry, sunny and mild	
	316.75		22/04/24 09:01		0.00	0.00	8.80	0.00	0.00					Dry, sunny and mild	
	316.75		22/04/24 09:02		0.00	0.00	7.00	0.00	0.00					Dry, sunny and mild	
	316.75		22/04/24 09:03		0.00	0.00	0.40	0.00	0.00					Dry, sunny and mild	
	316.75		22/04/24 09:04		0.00	0.00	6.00	0.00	0.00					Dry, sunny and mild	
	316.75		22/04/24 09:05		0.00	0.00	6.20	0.00	0.00		-1.40			Dry, sunny and mild	
	BH21	326.49		01/12/23 00:00									0.25	326.24	
		326.49		08/12/23 00:00									0.33	326.16	
326.49			15/12/23 00:00									0.36	326.13		
326.49			19/12/23 00:00									0.30	326.19		
326.49			12/01/24 00:00									0.35	326.14		
326.49			31/01/24 09:00	961	0.00	0.10	19.10	0.00	1.00	0.00	0.00	0.28	326.21	Overcast, raining	
326.49			31/01/24 09:01		0.00	0.10	19.20	0.00	0.00					Overcast, raining	
326.49			31/01/24 09:02		0.00	0.10	19.20	0.00	1.00					Overcast, raining	
326.49			31/01/24 09:03		0.00	0.10	19.20	0.00	1.00					Overcast, raining	
326.49			31/01/24 09:04		0.00	0.10	19.20	0.00	0.00					Overcast, raining	
326.49			31/01/24 09:05		0.00	0.10	19.10	0.00	1.00					Overcast, raining	
326.49			28/02/24 09:00	962	0.00	0.10	19.10	0.00	0.00	0.00	0.00	0.27	326.22	Overcast, raining	
326.49			28/02/24 09:01		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
326.49			28/02/24 09:02		0.00	0.10	19.40	0.00	1.00					Overcast, raining	
326.49			28/02/24 09:03		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
326.49			28/02/24 09:04		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
326.49		28/02/24 09:05		0.00	0.10	19.40	0.00	0.00		0.00			Overcast, raining		
	Originator	Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES												Fig No: E2 Sheet 4 of 7	
Chk & App	Status														
FMR	Final														



Site: LT521 FASNAKYLE 400KV SUBSTATION

Contract No: 26560

Client: SSEN Transmission

Engineer: Jacobs

* Water level measurements taken from ground level.

Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)					
BH21	326.49		26/03/24 09:19	956	0.00	0.00	17.80	0.00	0.00	-0.30	-0.50	0.31	326.18	Overcast, occasional snow
	326.49		26/03/24 09:20		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	326.49		26/03/24 09:21		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	326.49		26/03/24 09:22		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	326.49		26/03/24 09:23		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow
	326.49		26/03/24 09:24		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow
	326.49		22/04/24 15:47	992	0.00	0.20	19.20	0.00	0.00	0.00	0.00	0.34	326.15	Dry, sunny and mild
	326.49		22/04/24 15:48		0.00	1.00	17.50	0.00	0.00					Dry, sunny and mild
	326.49		22/04/24 15:49		0.00	1.10	17.50	0.00	0.00					Dry, sunny and mild
	326.49		22/04/24 15:50		0.00	1.20	17.40	0.00	0.00					Dry, sunny and mild
	326.49		22/04/24 15:51		0.00	1.20	17.40	0.00	0.00					Dry, sunny and mild
	326.49		22/04/24 15:52		0.00	1.10	17.60	0.00	0.00					Dry, sunny and mild
BH22	333.84		31/01/24 09:00	966	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.69	333.15	Overcast, raining
	333.84		31/01/24 09:01		0.00	0.10	19.10	0.00	0.00					Overcast, raining
	333.84		31/01/24 09:02		0.00	0.10	19.10	0.00	0.00					Overcast, raining
	333.84		31/01/24 09:03		0.00	0.10	19.10	0.00	0.00					Overcast, raining
	333.84		31/01/24 09:04		0.00	0.10	19.00	0.00	0.00					Overcast, raining
	333.84		31/01/24 09:05		0.00	0.10	19.00	0.00	0.00					Overcast, raining
	333.84		28/02/24 09:00	960	0.00	0.00	19.60	0.00	0.00	0.00	0.00	0.83	333.01	Overcast, raining
	333.84		28/02/24 09:01		0.00	0.10	19.50	0.00	1.00					Overcast, raining
	333.84		28/02/24 09:02		0.00	0.10	19.50	0.00	0.00					Overcast, raining
	333.84		28/02/24 09:03		0.00	0.10	19.50	1.00	0.00					Overcast, raining
	333.84		28/02/24 09:04		0.00	0.10	19.50	0.00	1.00					Overcast, raining
	333.84		28/02/24 09:05		0.00	0.10	19.50	0.00	0.00		0.00			Overcast, raining
	333.84		25/03/24 14:22	960	0.00	0.00	17.80	0.00	0.00	-3.00	0.00	0.85	332.99	Overcast, occasional snow
	333.84		25/03/24 14:23		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	333.84		25/03/24 14:24		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	333.84		25/03/24 14:25		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	333.84		25/03/24 14:26		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	333.84		25/03/24 14:27		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	333.84		23/04/24 12:45	988	0.00	1.30	18.70	0.00	0.00	0.00	0.00	1.90	331.94	Dry, overcast and cool
	333.84		23/04/24 12:46		0.00	1.90	17.10	0.00	0.00					Dry, overcast and cool
	333.84		23/04/24 12:47		0.00	1.90	17.10	0.00	0.00					Dry, overcast and cool
	333.84		23/04/24 12:48		0.00	1.80	17.30	0.00	0.00					Dry, overcast and cool
	333.84		23/04/24 12:49		0.00	1.80	17.50	0.00	0.00					Dry, overcast and cool
	333.84		23/04/24 12:50		0.00	1.80	17.60	0.00	0.00					Dry, overcast and cool
BH23	316.00		12/01/23 00:00									0.30	315.70	
	316.00		08/12/23 00:00									0.25	315.75	
	316.00		15/12/23 00:00									0.00	316.00	
	316.00		19/12/23 00:00									0.06	315.94	
	316.00		01/02/24 09:00	984	0.00	0.00	19.20	0.00	0.00	0.00	0.00	0.00	316.00	Dry, Overcast
	316.00		01/02/24 09:01		0.00	0.00	19.30	0.00	0.00					Dry, Overcast
	316.00		01/02/24 09:02		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	316.00		01/02/24 09:03		0.00	0.00	19.20	0.00	0.00					Dry, Overcast

Originator

Title:

JMcM

RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig No:

E2

Sheet 5 of 7

Chk & App
FMR

Status
Final



				Site: LT521 FASNAKYLE 400KV SUBSTATION								Contract No: 26560		
				Client: SSEN Transmission Engineer: Jacobs								Water level measurements taken from ground level.		
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)					
BH23	316.00		01/02/24 09:04		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	316.00		01/02/24 09:05		0.00	0.00	19.20	0.00	0.00					Dry, Overcast
	316.00		28/02/24 09:00	966	0.00	0.10	20.20	0.00	1.00	5.00	1.50	0.21	315.79	Overcast, raining
	316.00		28/02/24 09:01		0.00	0.10	19.70	0.00	2.00					Overcast, raining
	316.00		28/02/24 09:02		0.00	0.10	19.70	0.00	1.00					Overcast, raining
	316.00		28/02/24 09:03		0.00	0.10	19.70	1.00	2.00					Overcast, raining
	316.00		28/02/24 09:04		0.00	0.10	19.60	1.00	1.00					Overcast, raining
	316.00		28/02/24 09:05		0.00	0.10	19.60	0.00	3.00		1.10			Overcast, raining
	316.00		26/03/24 09:37	957	0.00	0.00	17.70	0.00	0.00	0.00	0.00	0.17	315.83	Overcast, occasional snow
	316.00		26/03/24 09:38		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	316.00		26/03/24 09:39		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow
	316.00		26/03/24 09:40		0.00	0.00	17.70	0.00	0.00					Overcast, occasional snow
	316.00		26/03/24 09:41		0.00	0.00	17.60	0.00	0.00					Overcast, occasional snow
	316.00		26/03/24 09:42		0.00	0.00	17.60	0.00	0.00					Overcast, occasional snow
	316.00		22/04/24 17:04	991	0.00	0.40	18.70	0.00	0.00	0.00	6.60	0.18	315.82	Dry, sunny and mild
	316.00		22/04/24 17:05		0.00	0.40	19.30	0.00	0.00					Dry, sunny and mild
	316.00		22/04/24 17:06		0.00	0.50	19.20	0.00	0.00					Dry, sunny and mild
	316.00		22/04/24 17:07		0.00	0.50	19.10	0.00	0.00					Dry, sunny and mild
	316.00		22/04/24 17:08		0.00	0.50	19.00	0.00	0.00					Dry, sunny and mild
	316.00		22/04/24 17:09		0.00	0.50	19.00	0.00	0.00		-0.10			Dry, sunny and mild
BH25	332.05		31/01/24 09:00	966	0.00	0.10	19.20	0.00	0.00	0.00	0.00	0.16	331.89	Overcast, raining
	332.05		31/01/24 09:01		0.00	0.10	19.30	0.00	1.00					Overcast, raining
	332.05		31/01/24 09:02		0.00	0.10	19.30	0.00	1.00					Overcast, raining
	332.05		31/01/24 09:03		0.00	0.10	19.30	0.00	0.00					Overcast, raining
	332.05		31/01/24 09:04		0.00	0.10	19.30	0.00	0.00					Overcast, raining
	332.05		31/01/24 09:05		0.00	0.10	19.20	0.00	0.00					Overcast, raining
	332.05		28/02/24 09:00	961	0.00	0.00	19.30	0.00	1.00	7.00	1.60	0.20	331.85	Overcast, raining
	332.05		28/02/24 09:01		0.00	0.10	19.50	0.00	0.00					Overcast, raining
	332.05		28/02/24 09:02		0.00	0.10	19.40	0.00	0.00					Overcast, raining
	332.05		28/02/24 09:03		0.00	0.10	19.40	0.00	0.00					Overcast, raining
	332.05		28/02/24 09:04		0.00	0.10	19.40	0.00	0.00					Overcast, raining
	332.05		28/02/24 09:05		0.00	0.10	19.40	0.00	1.00		1.60			Overcast, raining
	332.05		25/03/24 14:41	960	0.00	0.00	17.80	0.00	0.00	-3.00	-0.40	0.18	331.87	Overcast, occasional snow
	332.05		25/03/24 14:42		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	332.05		25/03/24 14:43		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	332.05		25/03/24 14:44		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	332.05		25/03/24 14:45		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	332.05		25/03/24 14:46		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow
	332.05		23/04/24 13:00	987	0.00	1.20	18.80	0.00	0.00	0.00	0.00	0.27	331.78	Dry, overcast and cool
	332.05		23/04/24 13:01		0.00	1.90	17.10	0.00	0.00					Dry, overcast and cool
	332.05		23/04/24 13:02		0.00	1.80	17.10	0.00	0.00					Dry, overcast and cool
	332.05		23/04/24 13:03		0.00	1.80	17.20	0.00	0.00					Dry, overcast and cool
	332.05		23/04/24 13:04		0.00	1.80	17.40	0.00	0.00					Dry, overcast and cool
	332.05		23/04/24 13:05		0.00	1.80	17.60	0.00	0.00					Dry, overcast and cool
Originator		Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES												
JMcM														
Chk & App	Status													
FMR	Final	 Fig No: E2 Sheet 6 of 7												

				Site: LT521 FASNAKYLE 400KV SUBSTATION								Contract No: 26560			
				Client: SSEN Transmission Engineer: Jacobs								* Water level measurements taken from ground level.			
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks	
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)						
BH26	315.06		24/11/23 00:00									0.30	314.76		
	315.06		01/12/23 00:00									0.33	314.73		
	315.06		08/12/23 00:00									0.51	314.55		
	315.06		15/12/23 00:00									0.80	314.26		
	315.06		19/12/23 00:00									0.75	314.31		
	315.06		12/01/24 00:00									0.47	314.59		
	315.06		01/02/24 00:00											Gas valve submerged	
	315.06		28/02/24 00:00											Gas valve submerged	
	315.06		25/03/24 00:00											Gas valve submerged	
	315.06		22/04/24 09:00	994	0.00	0.10	19.60	0.00	0.00	0.00	0.00			Dry, sunny and mild	
	315.06		22/04/24 09:01											Test terminated due to water	
														ingress	
BH27	331.69		12/01/23 00:00									0.16	331.53		
	331.69		19/12/23 00:00									0.34	331.35		
	331.69		09/01/24 00:00									0.43	331.26		
	331.69		01/02/24 09:00	986	0.00	0.00	18.90	0.00	0.00	0.00	0.40	0.17	331.52	Dry, Overcast	
	331.69		01/02/24 09:01		0.00	0.00	19.00	0.00	0.00					Dry, Overcast	
	331.69		01/02/24 09:02		0.00	0.00	19.20	0.00	1.00					Dry, Overcast	
	331.69		01/02/24 09:03		0.00	0.00	19.00	0.00	0.00					Dry, Overcast	
	331.69		01/02/24 09:04		0.00	0.00	19.10	0.00	0.00					Dry, Overcast	
	331.69		01/02/24 09:05		0.00	0.00	19.00	0.00	1.00					Dry, Overcast	
	331.69		28/02/24 09:00	962	0.00	0.00	19.60	0.00	0.00	0.00	0.00	0.19	331.50	Overcast, raining	
	331.69		28/02/24 09:01		0.00	0.00	19.50	0.00	0.00					Overcast, raining	
	331.69		28/02/24 09:02		0.00	0.00	19.50	0.00	0.00					Overcast, raining	
	331.69		28/02/24 09:03		0.00	0.00	19.50	0.00	1.00					Overcast, raining	
	331.69		28/02/24 09:04		0.00	0.10	19.50	0.00	0.00					Overcast, raining	
	331.69		28/02/24 09:05		0.00	0.10	19.50	0.00	0.00		0.00			Overcast, raining	
	331.69		25/03/24 14:05	960	0.00	0.00	17.80	0.00	0.00	-3.00	-0.40	0.24	331.45	Overcast, occasional snow	
	331.69		25/03/24 14:06		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	331.69		25/03/24 14:07		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	331.69		25/03/24 14:08		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	331.69		25/03/24 14:09		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	331.69		25/03/24 14:10		0.00	0.00	17.80	0.00	0.00					Overcast, occasional snow	
	331.69		23/04/24 12:30	989	0.00	1.30	18.60	0.00	0.00	0.00	-17.10	0.29	331.40	Dry, overcast and cool	
	331.69		23/04/24 12:31		0.00	2.00	17.00	0.00	0.00					Dry, overcast and cool	
	331.69		23/04/24 12:32		0.00	1.90	17.10	0.00	0.00					Dry, overcast and cool	
	331.69		23/04/24 12:33		0.00	1.90	17.20	0.00	0.00					Dry, overcast and cool	
	331.69		23/04/24 12:34		0.00	1.90	17.40	0.00	0.00					Dry, overcast and cool	
	331.69		23/04/24 12:35		0.00	1.80	17.50	0.00	0.00		0.00			Dry, overcast and cool	
	Originator	Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES													Fig No: E2
Chk & App	Status														
FMR	Final														
													Sheet 7 of 7		

Style: SPIPE MONITORING File: P:\GINTW\PROJECTS\26560.GPJ Printed: 23/05/2024 11:56:09 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01898-711177 E-mail: enquiries@raeburndrilling.com

Borehole ID	Date	Well Volume	Parameter					
			pH	T (°C)	EC (us/cm)	DO (mg/l)	DO (%)	REDOX (mV)
BH02	30/01/2024	0.5	6.02	6.10	198.00	1.45	12.30	83.90
		1	5.68	5.80	129.00	0.82	6.80	94.90
		2	PURGED DRY					
		3						
BH04	01/02/2024	0.5	6.76	5.80	148.00	1.67	13.70	-2.80
		1	6.62	5.80	157.00	2.34	19.90	14.10
		2	6.58	5.60	182.00	1.99	16.30	13.40
		3	6.52	5.60	246.00	4.93	40.70	7.10
BH08	30/01/2024	0.5	6.19	5.90	177.00	4.66	39.40	46.30
		1	6.22	6.20	149.00	2.40	20.20	39.10
		2	6.24	6.40	151.00	2.07	17.30	28.00
		3	6.24	6.50	134.00	2.23	18.80	22.20
BH11	30/01/2024	0.5	12.81	6.58	3413.00	3.71	31.70	-69.80
		1	12.79	6.20	2931.00	1.94	16.30	-96.60
		2	PURGED DRY					
		3						
BH14	15/01/2024	0.5	6.34	4.38	299.00	3.38	27.60	-156.40
		1	6.43	5.40	313.00	2.34	19.40	-160.20
		2	6.49	5.40	293.00	1.54	12.60	-178.40
		3	6.52	4.90	292.00	1.35	10.90	-184.80
BH16	01/02/2024	0.5	6.13	6.50	286.00	2.79	24.00	130.70
		1	6.20	6.90	310.00	2.82	23.90	133.40
		2	PURGED DRY					
		3						
BH18	13/12/2023	0.5	6.34	5.40	361.00	2.99	27.00	82.60
		1	6.46	5.85	316.00	2.00	16.60	91.40
		2	6.39	6.10	301.00	1.37	11.60	92.00
		3	6.08	6.30	277.00	2.01	17.00	114.00
BH21	13/12/2023	0.5	5.78	7.20	156.00	2.10	18.40	125.60
		1	5.73	7.40	143.00	1.09	9.50	82.60
		2	5.71	7.60	166.00	0.74	6.50	54.60
		3	5.74	7.40	164.00	1.46	12.70	46.20



Borehole ID	Date	Well Volume	Parameter					
			pH	T (°C)	EC (us/cm)	DO (mg/l)	DO (%)	REDOX (mV)
BH22	31/01/2024	0.5	6.22	4.88	135.00	1.49	12.4N	40.90
		1	6.14	5.00	111.00	1.06	8.70	33.60
		2	6.12	5.00	110.00	2.09	17.20	36.40
		3	6.11	4.70	97.00	1.51	12.30	32.40
BH23	15/01/2024	0.5	6.29	3.90	163.00	6.91	55.10	163.40
		1	6.16	4.90	139.00	5.73	46.70	163.90
		2	5.59	4.30	36.00	6.08	49.00	176.30
		3	5.40	5.20	38.00	5.43	44.60	177.50
BH25	31/01/2024	0.5	6.61	5.10	125.00	1.95	16.50	24.40
		1	6.30	5.10	104.00	1.99	16.60	10.80
		2	6.10	5.00	103.00	2.19	18.00	11.30
		3	6.05	4.80	97.00	2.56	20.80	2.70
BH26	13/12/2023	0.5	7.59	6.55	95.00	8.81	75.40	180.70
		1	6.92	6.50	66.00	7.79	66.10	211.10
		2	6.15	6.50	80.00	7.49	63.70	230.60
		3	5.86	6.20	67.00	7.55	63.80	238.80
BH27	01/02/2024	0.5	7.00	5.60	117.00	3.10	25.70	92.50
		1	6.44	5.70	57.00	2.31	19.10	97.90
		2	5.90	5.80	61.00	1.40	11.50	98.10
		3	5.82	5.80	58.00	3.25	26.90	101.60



Site: LT521 FASNAKYLE 400KV SUBSTATION

Contract No: 26560

Client: SSEN Transmission

Engineer: Jacobs

TEST

CLASSIFICATION TESTS

Determination of water content
Determination of liquid limit
Determination of liquid and plastic limits
Determination of bulk density
Determination of particle density
Determination of particle size distribution

CHEMICAL TESTS

Determination of organic matter content
Determination of mass loss on ignition
Determination of sulphate content of soil and groundwater
Determination of chloride content
Determination of pH value

COMPACTION-RELATED TESTS

Determination of dry density/moisture content relationship
Determination of moisture condition value (MCV)
Determination of California Bearing Ratio (CBR)

CONSOLIDATION AND STRENGTH TESTS

Incremental loading oedometer test
Unconfined compression test
Unconsolidated undrained triaxial test
Consolidated triaxial compression tests on water saturated soils
Lab Vane Tests
Direct shear tests
Permeability tests
Fall cone test

ROCK TESTS

Determination of point load strength
Determination of unconfined compressive strength
LA Abrasion Tests
Magnesium Soundness Tests
Slake durability
Rock porosity / density

STANDARD

BS EN ISO 17892-1:2014
BS 1377 : 1990 : Part 2 : 4.3 and 4.4
BS EN ISO 17892-12:2018
BS EN ISO 17892-2:2014
BS EN ISO 17892-3:2016
BS EN ISO 17892-4:2016

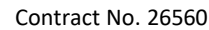
BS 1377 : 1990 : Part 3 : 3.4
BS 1377 : 1990 : Part 3 : 4.3
BS 1377 : 1990 : Part 3 : 5.2, 5.3 and 5.5
BS 1377 : 1990 : Part 3 : 7.2 and 7.3
BS 1377 : 1990 : Part 3 : 9.5

BS 1377 : 1990 : Part 4 : 3.3 to 3.6
SDD Tech Memo SH7/83; SDD Appls Guide No.1 Rev. 1989
BS 1377 : 1990 : Part 4 : 7.4

BS EN ISO 17892-5:2017
BS EN ISO 17892-7:2018
BS EN ISO 17892-8:2018
BS EN ISO 17892-9:2018
BS 1377 : 1990
BS EN ISO 17892-10:2019
BS EN ISO 17892-11:2019
BS EN ISO 17892-6:2017

ISRM Commission on Testing Methods, 1985
ASTM D7012-14
BS EN 1097-2:2010 and BS 818 : Part 2 : 1990
BS EN 1367-2
ISRM Suggested methods
ISRM Suggested methods



Figure No. F0

				SiteLT521 FASNAKYLE 400KV SUBSTATION		Contract No26560	
				ClientSSEN Transmission			
				EngineerJacobs			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
BH02	0.10		B	2013667	Brown very gravelly very silty very sandy PEAT. Gravel is fine to medium	338.0	
BH12	0.50		B	2013669	Brown silty very gravelly SAND. Gravel is fine to coarse	39.5	
BH17	0.50		D	2013177	Brown silty SAND with organic material	38.2	
BH17	1.20-2.20		U	2013178	Dark brown fibrous PEAT	105.0	
BH28	0.50		B	2013353	Dark brown fibrous PEAT	918.0	
BH28	2.65		B	2013354	Dark brown fibrous PEAT	646.0	
TP01	0.50		D	2013181	Dark brown fibrous PEAT	875.0	
TP03	0.00-0.00		D	2013184	Dark brown fibrous PEAT	348.0	
TP06	0.00-0.00		D	2012881	Brown fibrous PEAT	292.0	
TP07	0.30		B	2013187	Brown slightly gravelly slightly sandy SILT. Gravel is fine to coarse	25.8	
TP09	0.00-0.00		D	2013190	Dark brown fibrous PEAT	239.0	
TP10	0.50		D	2012882	Brown fibrous PEAT	818.0	
TP11	1.00		D	2013192	Dark brown fibrous PEAT	1353.0	
TP13	0.30		D	2013196	Brown sandy SILT with organic material	102.0	
Notes							
Originator		Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014		 Figure F1	
TP		CD 05/03/2024					
Sheet 1 of 2							

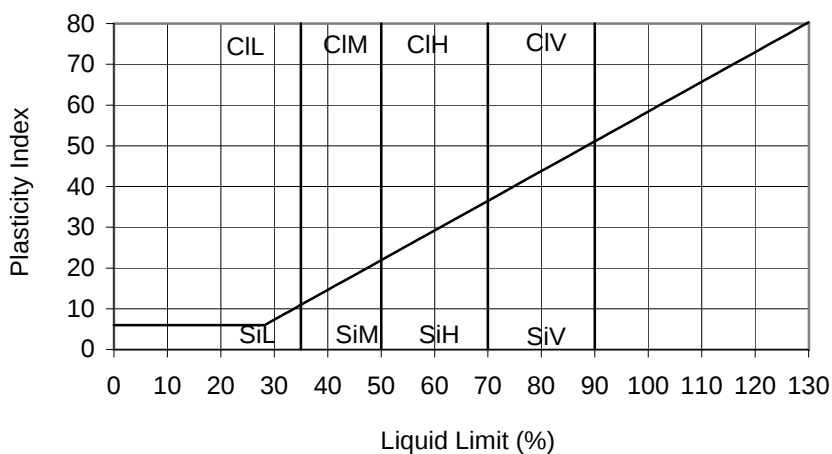
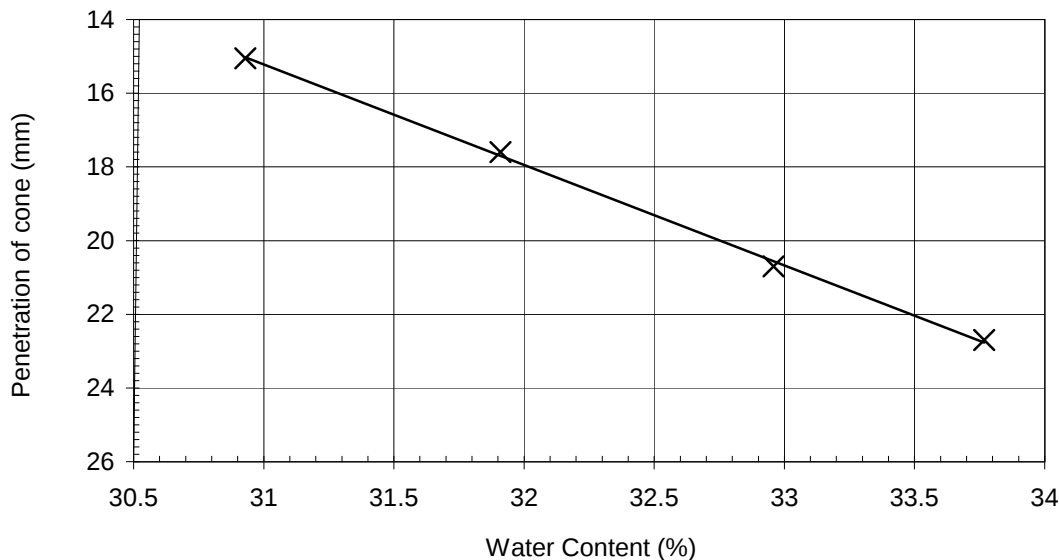
				SiteLT521 FASNAKYLE 400KV SUBSTATION			Contract No26560	
				ClientSSEN Transmission				
				EngineerJacobs				
Sample Identification								
Exploratory Hole	Depth m	Sample Ref	Sample Type					Lab Sample ID
TP15	0.50		D	2013200	Brown fibrous PEAT	661.0		
TP16	0.00-0.00		D	2013202	Brown gravelly silty SAND. Gravel is fine to coarse	19.3		
TP17	1.00		D	2013206	Dark brown fibrous PEAT	1045.0		
TP18	0.50		D	2012885	Brown fibrous PEAT	593.0		
TP20	0.50		B	2012888	Brown silty very sandy fine to coarse GRAVEL with cobbles and organic matter	41.8		
TP21	0.00-0.00		D	2012889	Brown fibrous PEAT	398.0		
TP22	1.00		D	2012891	Brown fibrous PEAT	918.0		
TP24	0.00-0.00		D	2012892	Brown fibrous PEAT	448.0		
TP28	1.00		D	2012897	Brown silty very sandy fine to coarse GRAVEL	6.4		
TP28	1.50		B	2012898	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	7.3		
TP28	2.50		D	2012899	Brown silty SAND and GRAVEL. Gravel is fine to coarse	10.7		
TP32	0.50		B	2012902	Brown silty very sandy fine to coarse GRAVEL	12.7		
TP36A	0.50		B	2013357	Brown silty SAND and GRAVEL woth organic material. Gravel is fine to coarse	24.1		
TP36A	0.50		D	2013356	Brown silty SAND and GRAVEL woth organic material. Gravel is fine to coarse	27.2		
Notes								
Originator		Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014			 Figure F1	
TP		CD 05/03/2024						
							Sheet 2 of 2	



Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No.	26560
Client	SSEN Transmission	Hole ID	BH12
Engineer	Jacobs	Sample Ref	
		Depth (m)	0.50
		Sample Type	B

Non Engineering Description : Brown silty very gravelly SAND. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Sample was determined to be Non-Plastic after preparation
Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 39.5 %
Percentage retained on 425µm sieve : 37 %
Liquid Limit : 33 %
Plastic Limit : Non-Plastic %

Equivalent water content of material passing 425µm sieve : 62.7 %

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure F2 Sheet 1 of 1
NW	CD 05/03/2024		



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No. 26560

Hole ID TP36A

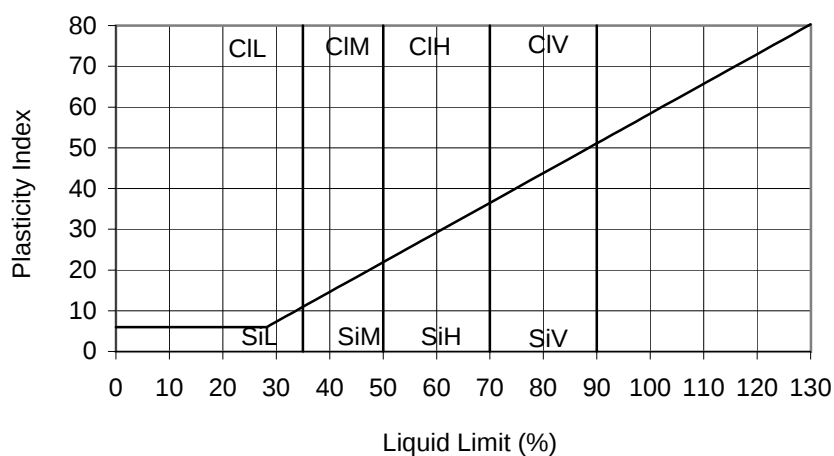
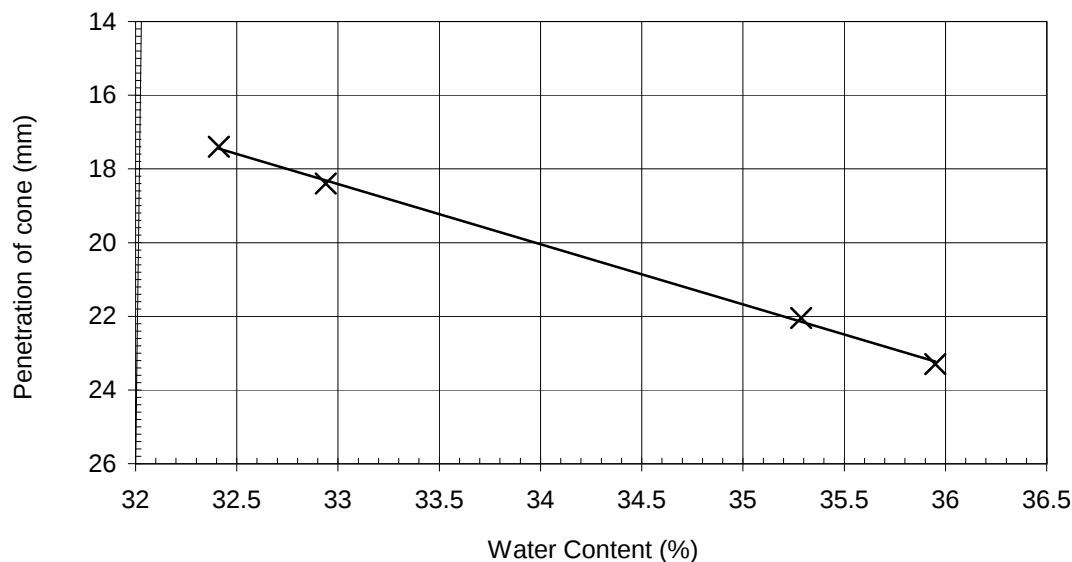
Sample Ref

Depth (m) 0.50

Sample Type D

Non Engineering Description : Brown silty SAND and GRAVEL with organic material. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Sample was determined to be Non-Plastic after preparation

Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014)	27.2 %
Percentage retained on 425µm sieve :	60 %
Liquid Limit :	34 %
Plastic Limit :	Non-Plastic %

Equivalent water content of material passing 425µm sieve : 68.0 %

Originator

Checked & Approved

NW

CD
05/03/2024

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS EN ISO 17892-12:2018 Clause 5.3

BS EN ISO 17892-12:2018 Clause 5.5



Figure F3

Sheet 1 of 1

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole BH02	
	Engineer Jacobs		Sample Ref Depth (m) 0.10 Sample Type B	

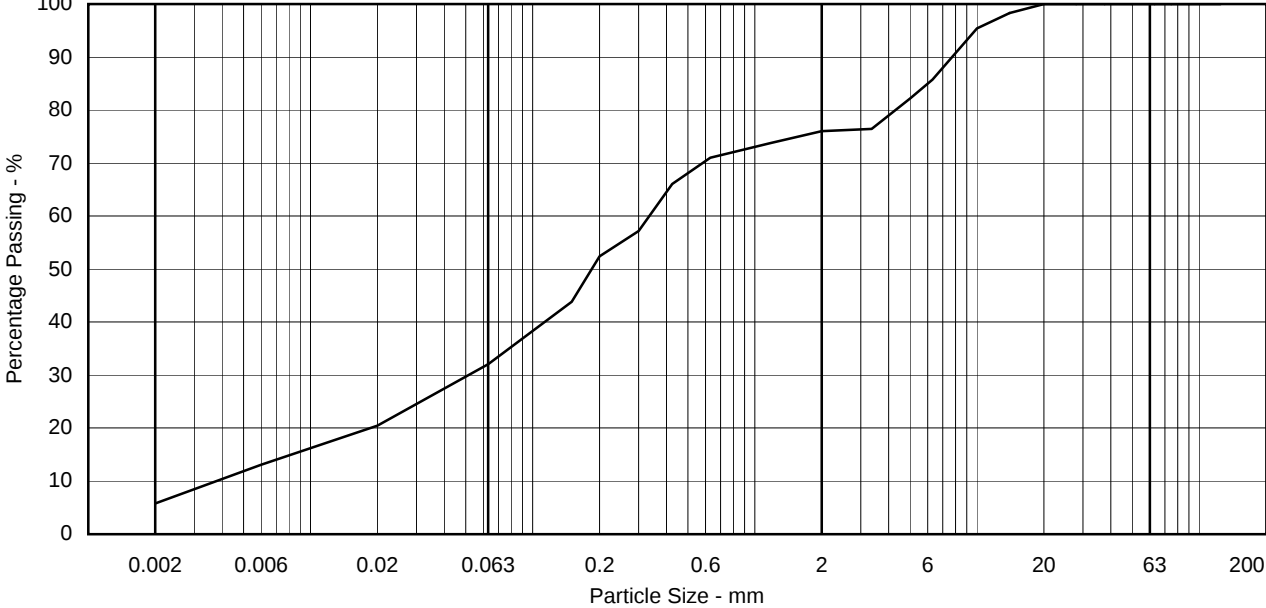
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	95
6.30 mm	86
5.00 mm	82
3.35 mm	76
2.00 mm	76
1.18 mm	74
630 µm	71
425 µm	66
300 µm	57
200 µm	52
150 µm	44
63 µm	32
20 µm	20
6 µm	13
2 µm	6

Non Engineering Description	
Brown very gravelly very silty very sandy PEAT. Gravel is fine to medium	

Sample Proportions - %	
Cobbles	0.0
Gravel	24.0
Sand	44.8
Silt	25.5
Clay	5.7
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	20
D60	0.34
D10	0.0038
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 89.5	

Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	 Figure F4 Sheet 1 of 1
RF	CD 05/03/2024		



SiteLT521 FASNAKYLE 400KV SUBSTATION

ClientSSEN Transmission

EngineerJacobs

Contract No26560

HoleBH03

Sample Ref

Depth (m)0.60

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	89
37.5 mm	80
28.0 mm	70
20.0 mm	61
14.0 mm	59
10.0 mm	56
6.30 mm	51
5.00 mm	49
3.35 mm	47
2.00 mm	46
1.18 mm	44
630 µm	43
425 µm	40
300 µm	35
200 µm	30
150 µm	21
63 µm	11
20 µm	6
6 µm	3
2 µm	2

Non Engineering Description

Brown silty very sandy fine to coarse GRAVEL

Sample Proportions - %

Cobbles	0.0
Gravel	53.9
Sand	35.8
Silt	7.9
Clay	2.4

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	63
D60	17
D10	0.053

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)320.8

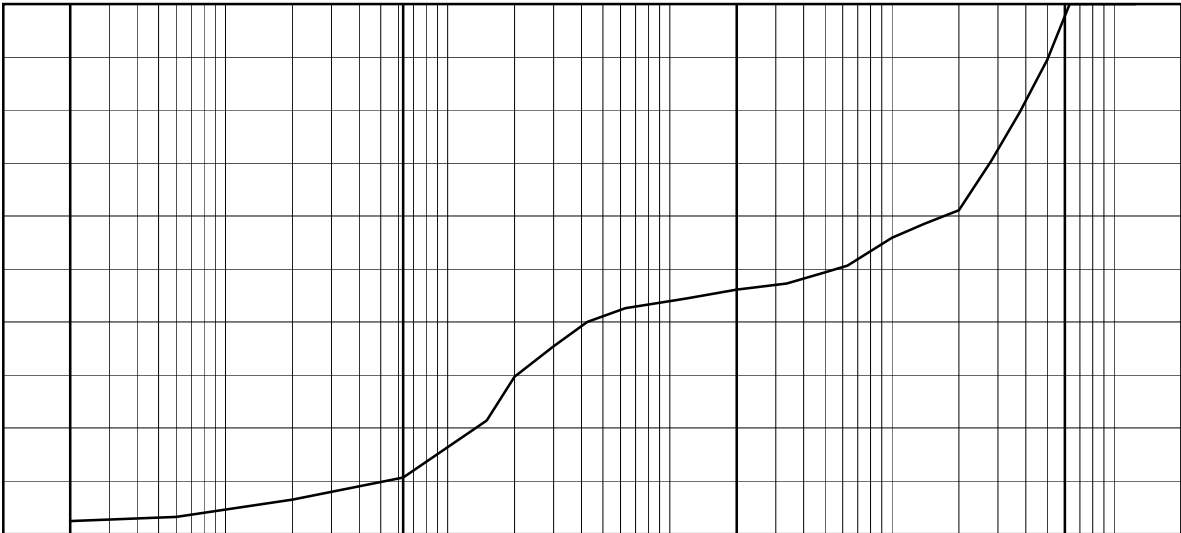
Notes

Sample does not comply with BS EN ISO 17892-4 minimum mass requirements

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

Checked & Approved

RF

CD
05/03/2024

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Figure F5

Sheet 1 of 1

	SiteLT521 FASNAKYLE 400KV SUBSTATION				Contract No26560	
	ClientSSEN Transmission				HoleBH12	
	EngineerJacobs				Sample Ref	
Depth (m)0.50						
				Sample TypeB		

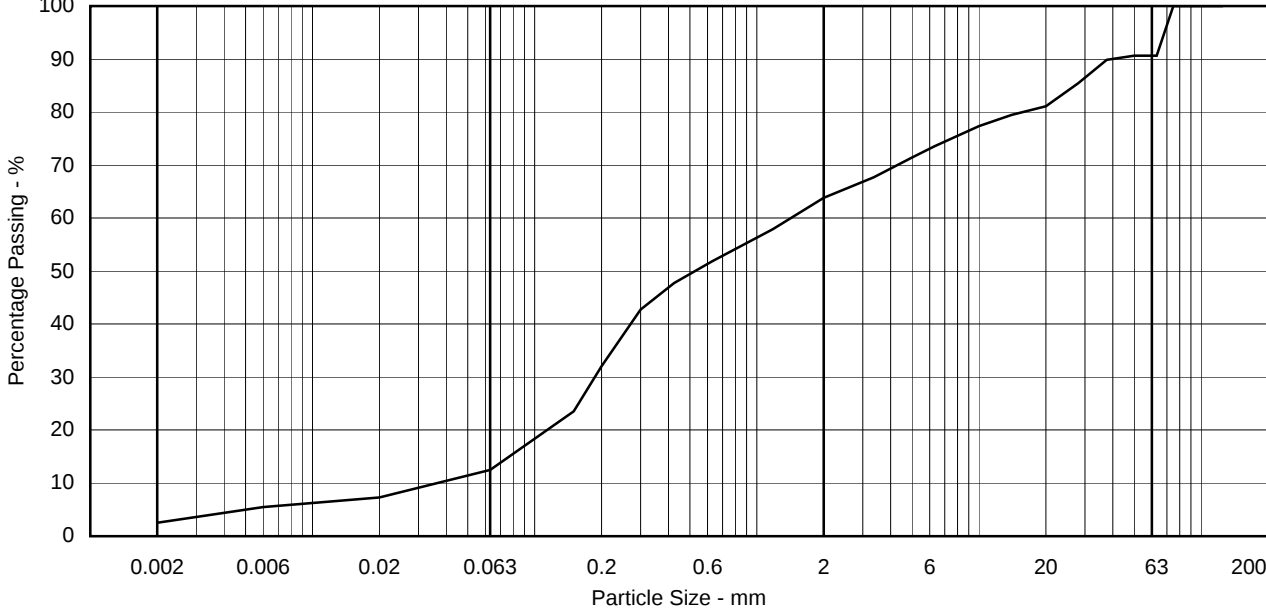
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	91
50.0 mm	91
37.5 mm	90
28.0 mm	85
20.0 mm	81
14.0 mm	79
10.0 mm	77
6.30 mm	74
5.00 mm	71
3.35 mm	68
2.00 mm	64
1.18 mm	58
630 µm	52
425 µm	48
300 µm	43
200 µm	32
150 µm	23
63 µm	12
20 µm	7
6 µm	5
2 µm	2

Non Engineering Description	
Brown silty very gravelly SAND. Gravel is fine to coarse	

Sample Proportions - %		
Cobbles	9.4	
Gravel	26.8	
Sand	51.7	
Silt	9.6	
Clay	2.5	
Particle Density - Assumed (Mg/m3)		2.65
Particle Diameter - mm		
D100	75	
D60	1.4	
D10	0.037	
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)		37.8

Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt									



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	 Figure F6 Sheet 1 of 1
RF	CD 05/03/2024		

	SiteLT521 FASNAKYLE 400KV SUBSTATION				Contract No26560	
	ClientSSEN Transmission				HoleBH14	
	EngineerJacobs				Sample Ref	
Depth (m)0.20						
				Sample TypeB		

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	86
37.5 mm	78
28.0 mm	77
20.0 mm	73
14.0 mm	73
10.0 mm	72
6.30 mm	70
5.00 mm	69
3.35 mm	68
2.00 mm	67
1.18 mm	65
630 µm	62
425 µm	60
300 µm	56
200 µm	42
150 µm	37
63 µm	26
20 µm	20
6 µm	14
2 µm	4

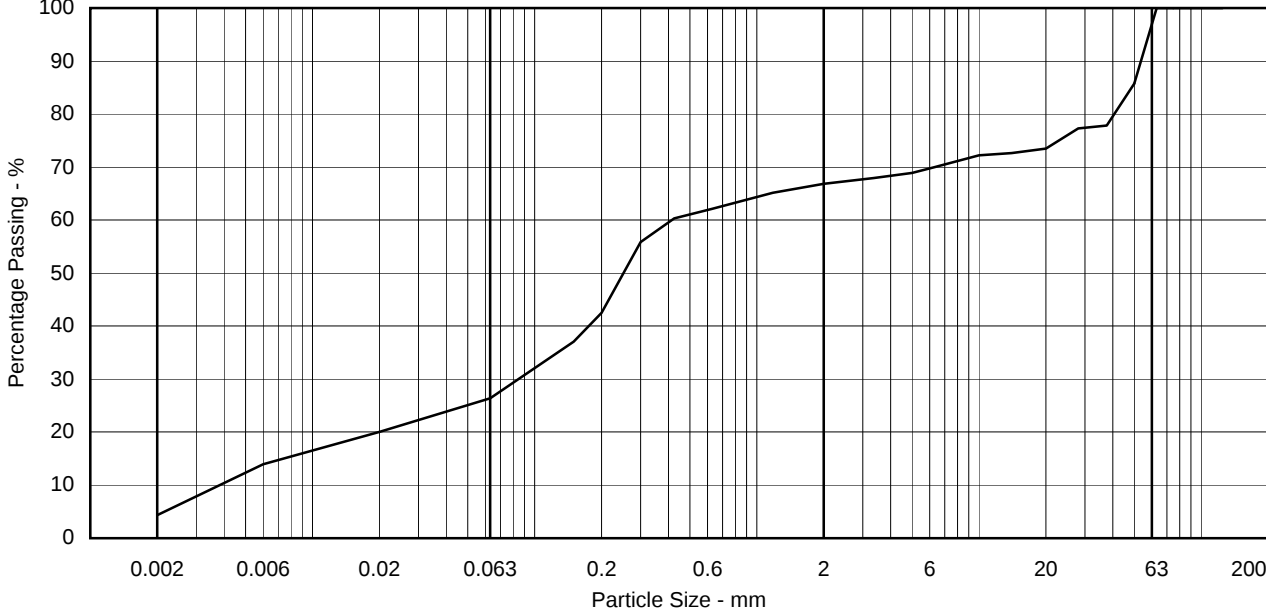
Non Engineering Description	
Brown very silty SAND and GRAVEL with organic material. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	33.2
Sand	40.9
Silt	21.6
Clay	4.3
Particle Density - Assumed (Mg/m3)	2.65
Particle Diameter - mm	
D100	63
D60	0.42
D10	0.0038
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	110.5

Notes	
Sample does not comply with BS EN ISO 17892-4 minimum mass requirements Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	 Figure F7 Sheet 1 of 1
JM	CD 05/03/2024		

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole BH16	
	Engineer Jacobs		Sample Ref Depth (m) 0.40 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	99
14.0 mm	95
10.0 mm	90
6.30 mm	75
5.00 mm	67
3.35 mm	66
2.00 mm	65
1.18 mm	63
630 µm	58
425 µm	52
300 µm	44
200 µm	34
150 µm	22
63 µm	9

Non Engineering Description	
Brown silty very gravelly SAND. Gravel is fine to coarse	

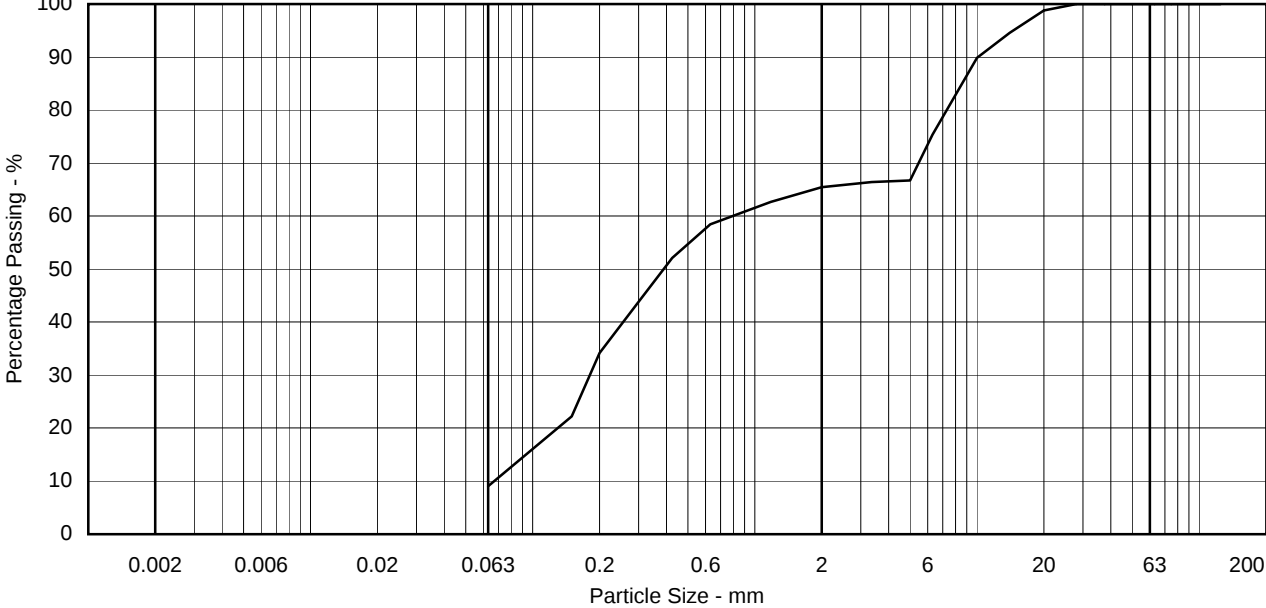
Sample Proportions - %	
Cobbles	0.0
Gravel	34.6
Sand	56.4
Silt & Clay	9.0

Particle Density - Assumed (Mg/m3)		2.65
------------------------------------	--	------

Particle Diameter - mm		
D100	28	
D60	0.79	
D10	0.067	
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)		11.8

Notes	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F8
RF	CD 05/03/2024		

Sheet 1 of 1

	SiteLT521 FASNAKYLE 400KV SUBSTATION				Contract No26560	
	ClientSSEN Transmission				HoleBH18	
	EngineerJacobs				Sample Ref	
Depth (m)					0.60	
				Sample Type	B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	96
50.0 mm	96
37.5 mm	92
28.0 mm	88
20.0 mm	84
14.0 mm	78
10.0 mm	75
6.30 mm	70
5.00 mm	67
3.35 mm	63
2.00 mm	60
1.18 mm	56
630 µm	51
425 µm	48
300 µm	45
200 µm	38
150 µm	30
63 µm	17
20 µm	10
6 µm	5
2 µm	2

Non Engineering Description	
Brown silty SAND and GRAVEL with cobbles and pockets of clay. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	4.0
Gravel	35.9
Sand	43.5
Silt	14.5
Clay	2.1
Particle Density - Assumed (Mg/m3)	2.65
Particle Diameter - mm	
D100	75
D60	2.0
D10	0.018
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	111.1

Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				

Percentage Passing - %

Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	 Figure F9
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SiteLT521 FASNAKYLE 400KV SUBSTATION

ClientSSEN Transmission

EngineerJacobs

Contract No26560

HoleBH18

Sample Ref

Depth (m)2.30

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	90
6.30 mm	80
5.00 mm	75
3.35 mm	73
2.00 mm	70
1.18 mm	65
630 µm	53
425 µm	44
300 µm	35
200 µm	27
150 µm	20
63 µm	15
20 µm	8
6 µm	4
2 µm	2

Non Engineering Description

Brown silty very gravelly SAND. Gravel is fine to medium

Sample Proportions - %

Cobbles	0.0
Gravel	29.9
Sand	55.8
Silt	12.6
Clay	1.7

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	20
D60	0.91
D10	0.029

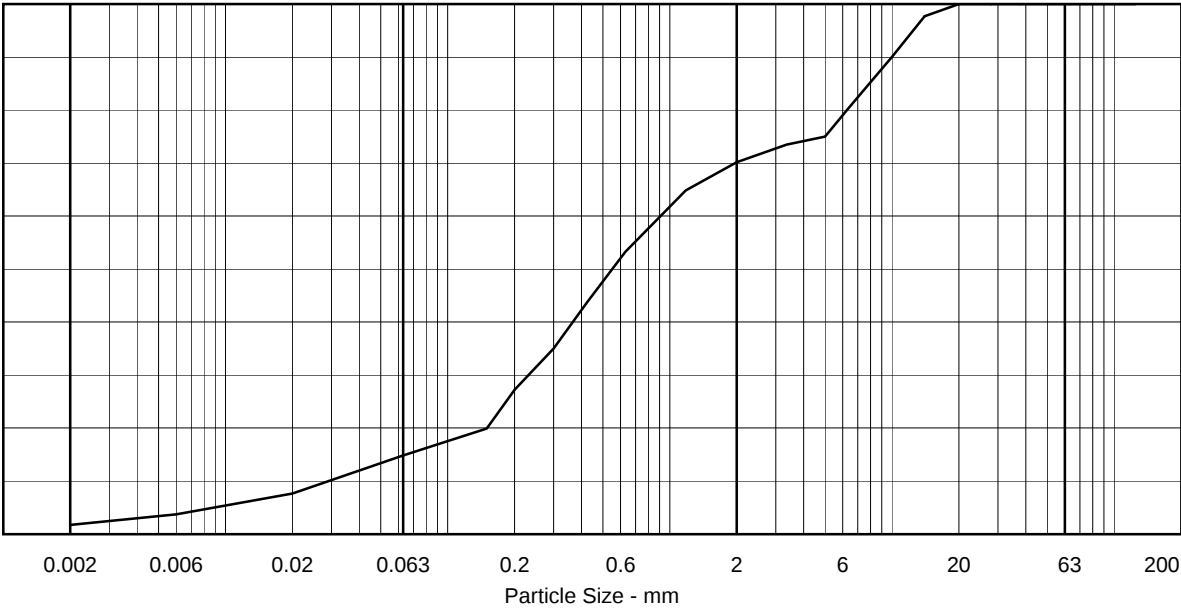
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)31.4

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

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05/03/2024

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Figure F10

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	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole BH24A	
	Engineer Jacobs		Sample Ref Depth (m) 1.00 Sample Type B	

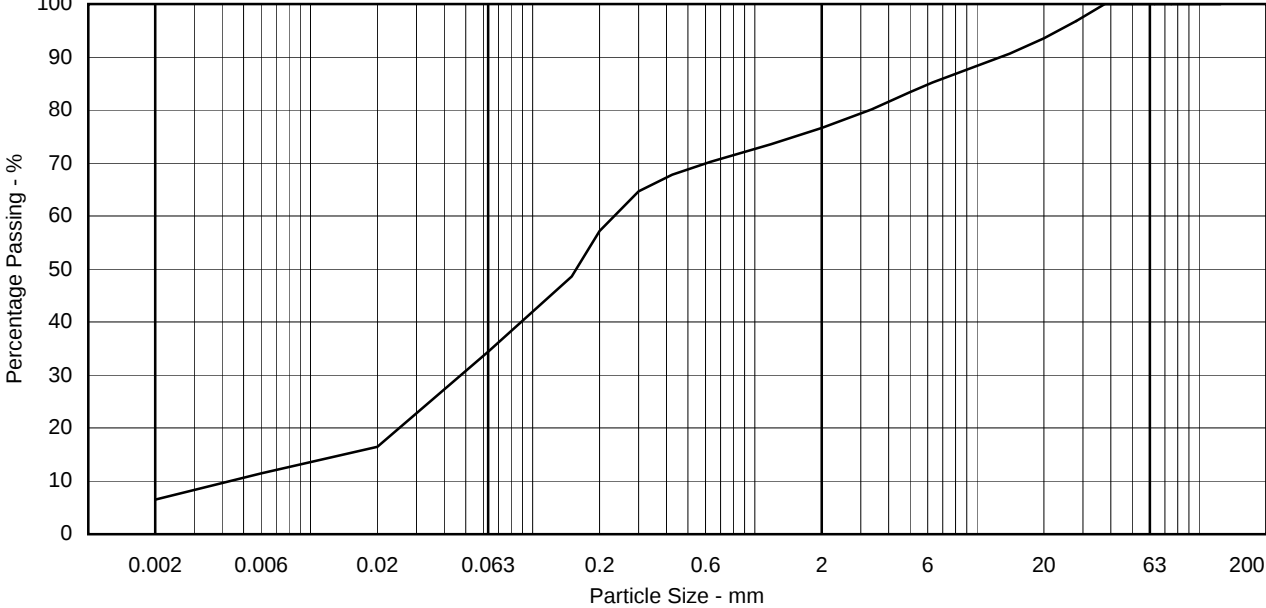
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	97
20.0 mm	94
14.0 mm	91
10.0 mm	88
6.30 mm	85
5.00 mm	83
3.35 mm	80
2.00 mm	77
1.18 mm	74
630 µm	70
425 µm	68
300 µm	65
200 µm	57
150 µm	49
63 µm	34
20 µm	16
6 µm	11
2 µm	6

Non Engineering Description	
Brown very gravelly very silty SAND with cobbles and pockets of clay. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	23.4
Sand	43.5
Silt	26.6
Clay	6.5
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	38
D60	0.23
D10	0.0044
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 52.3	

Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	 Figure F11 Sheet 1 of 1
SG	CD 05/03/2024		

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F12
RF	CD 05/03/2024		

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F13
RF	CD 05/03/2024		

	SiteLT521 FASNAKYLE 400KV SUBSTATION				Contract No26560	
	ClientSSEN Transmission				HoleTP05	
	EngineerJacobs				Sample Ref	
Depth (m)0.50						
				Sample TypeB		

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	88
37.5 mm	83
28.0 mm	79
20.0 mm	73
14.0 mm	72
10.0 mm	70
6.30 mm	69
5.00 mm	67
3.35 mm	64
2.00 mm	60
1.18 mm	54
630 µm	48
425 µm	40
300 µm	31
200 µm	24
150 µm	19
63 µm	17
20 µm	8
6 µm	4
2 µm	2

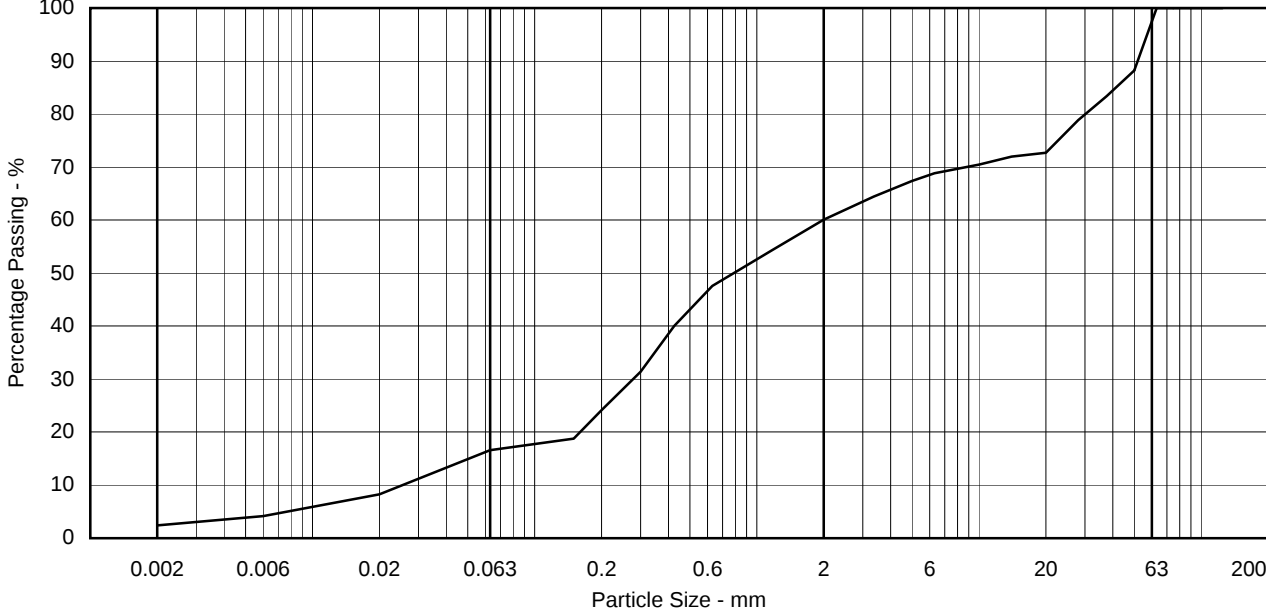
Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	39.9
Sand	44.1
Silt	13.6
Clay	2.3
Particle Density - Assumed (Mg/m3)	2.65
Particle Diameter - mm	
D100	63
D60	2.0
D10	0.026
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	76.9

Notes	
Sample does not comply with BS EN ISO 17892-4 minimum mass requirements Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	 Figure F14 Sheet 1 of 1
JM	CD 05/03/2024		

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F15
MC	CD 05/03/2024		

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP12	
	Engineer Jacobs		Sample Ref Depth (m) 0.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	96
28.0 mm	91
20.0 mm	87
14.0 mm	75
10.0 mm	68
6.30 mm	64
5.00 mm	61
3.35 mm	60
2.00 mm	58
1.18 mm	54
630 µm	49
425 µm	42
300 µm	28
200 µm	19
150 µm	10
63 µm	4

Non Engineering Description

Brown slightly silty SAND and GRAVEL. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	42.5
Sand	53.4
Silt & Clay	4.1

Particle Density - Assumed (Mg/m3)2.65

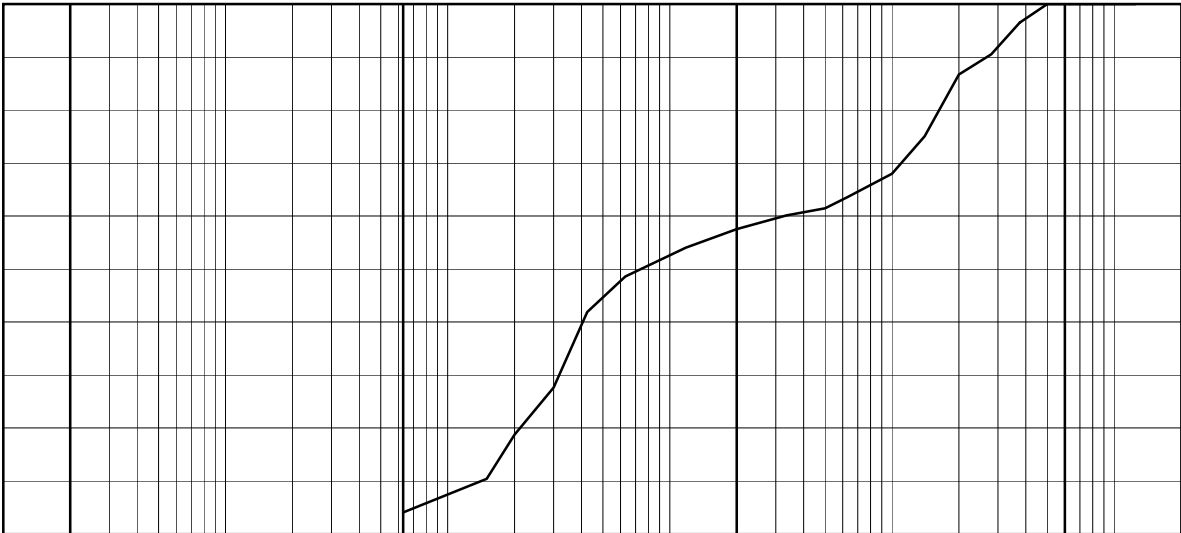
Particle Diameter - mm

D100	50
D60	3.3
D10	0.14
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	23.6

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F16
RF	CD 05/03/2024		

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	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP14	
	Engineer Jacobs		Sample Ref Depth (m) 0.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	85
63.0 mm	85
50.0 mm	79
37.5 mm	74
28.0 mm	67
20.0 mm	58
14.0 mm	56
10.0 mm	52
6.30 mm	47
5.00 mm	45
3.35 mm	42
2.00 mm	38
1.18 mm	33
630 µm	26
425 µm	19
300 µm	12
200 µm	7
150 µm	4
63 µm	3

Non Engineering Description

Briwn slightly silty SAND and GRAVEL with cobbles.
Gravel is fine to coarse

Sample Proportions - %

Cobbles	15.1
Gravel	46.6
Sand	35.4
Silt & Clay	2.8

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	90
D60	21
D10	0.26
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	80.8

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt									

Percentage Passing - %

Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	Figure F17 Sheet 1 of 1
JM	CD 05/03/2024		

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP16	
	Engineer Jacobs		Sample Ref Depth (m) 0.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	94
50.0 mm	91
37.5 mm	90
28.0 mm	89
20.0 mm	87
14.0 mm	82
10.0 mm	73
6.30 mm	60
5.00 mm	55
3.35 mm	51
2.00 mm	47
1.18 mm	44
630 µm	37
425 µm	31
300 µm	23
200 µm	16
150 µm	10
63 µm	4

Non Engineering Description	
Briwn slightly silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	

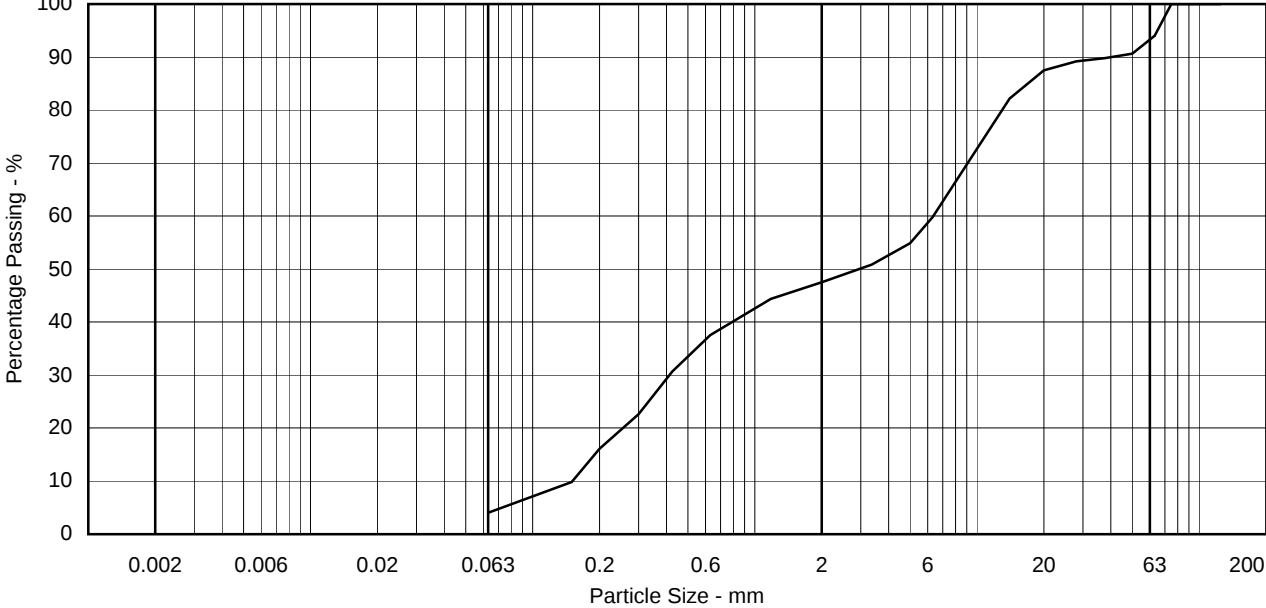
Sample Proportions - %	
Cobbles	6.0
Gravel	46.5
Sand	43.5
Silt & Clay	4.0

Particle Density - Assumed (Mg/m3)		2.65
------------------------------------	--	------

Particle Diameter - mm		
D100	75	
D60	6.4	
D10	0.15	
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)		42.7

Notes	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F18
RF	CD 05/03/2024		

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Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F19
SG	CD 05/03/2024		

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP25	
	Engineer Jacobs		Sample Ref Depth (m) 0.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	87
75.0 mm	87
63.0 mm	82
50.0 mm	78
37.5 mm	73
28.0 mm	69
20.0 mm	66
14.0 mm	57
10.0 mm	53
6.30 mm	51
5.00 mm	51
3.35 mm	50
2.00 mm	49
1.18 mm	48
630 µm	45
425 µm	42
300 µm	37
200 µm	28
150 µm	18
63 µm	6

Non Engineering Description

Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	17.9
Gravel	33.0
Sand	43.2
Silt & Clay	5.9

Particle Density - Assumed (Mg/m3)2.65

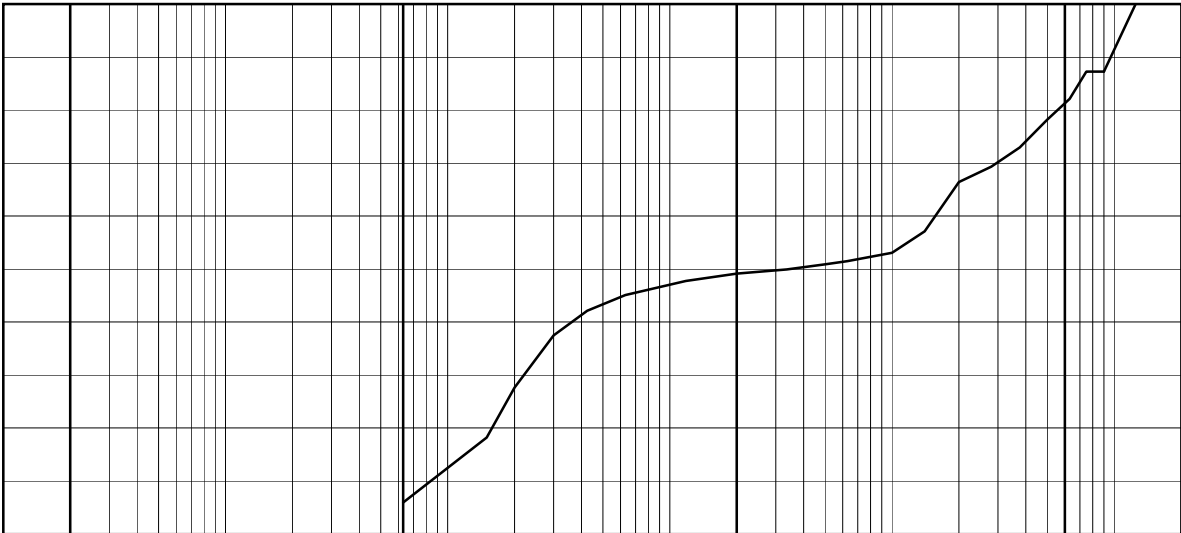
Particle Diameter - mm

D100	125
D60	16
D10	0.084
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	190.5

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	Figure F20 Sheet 1 of 1
SG	CD 05/03/2024		

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP28	
	Engineer Jacobs		Sample Ref Depth (m) 1.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	90
63.0 mm	87
50.0 mm	82
37.5 mm	75
28.0 mm	69
20.0 mm	64
14.0 mm	55
10.0 mm	51
6.30 mm	49
5.00 mm	47
3.35 mm	45
2.00 mm	43
1.18 mm	41
630 µm	39
425 µm	37
300 µm	33
200 µm	25
150 µm	18
63 µm	7

Non Engineering Description

Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	13.0
Gravel	43.8
Sand	36.2
Silt & Clay	7.0

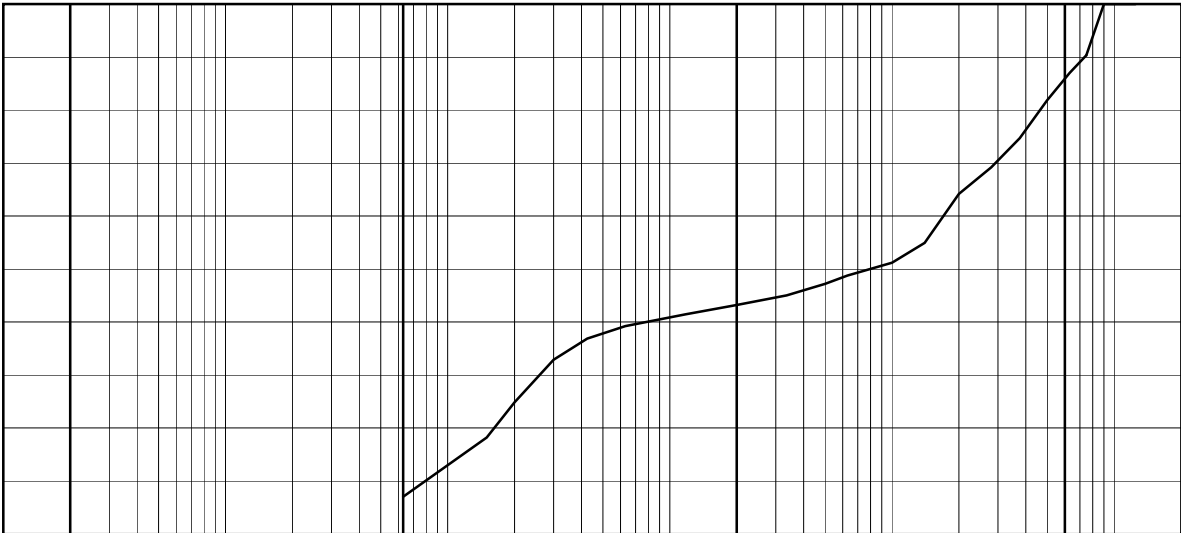
Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	90
D60	17
D10	0.079
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	215.2

Notes

Percentage Passing - %



Particle Size - mm

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP29	
	Engineer Jacobs		Sample Ref Depth (m) 1.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	96
37.5 mm	76
28.0 mm	66
20.0 mm	63
14.0 mm	51
10.0 mm	47
6.30 mm	43
5.00 mm	41
3.35 mm	40
2.00 mm	38
1.18 mm	36
630 µm	32
425 µm	28
300 µm	23
200 µm	18
150 µm	14
63 µm	8

Non Engineering Description

Brown silty very sandy fine to coarse GRAVEL

Sample Proportions - %

Cobbles	0.0
Gravel	62.2
Sand	29.5
Silt & Clay	8.3

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

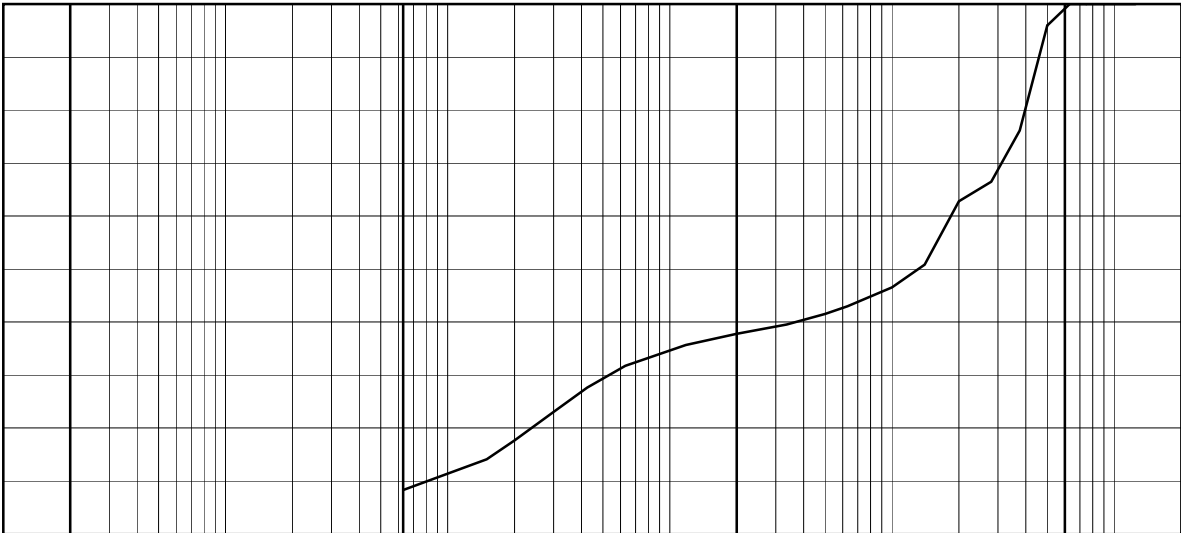
D100	63
D60	18
D10	0.082
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	219.5

Notes

Sample does not comply with BS EN ISO 17892-4 minimum mass requirements

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F22
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	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP32	
	Engineer Jacobs		Sample Ref Depth (m) 0.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	94
28.0 mm	90
20.0 mm	86
14.0 mm	64
10.0 mm	58
6.30 mm	50
5.00 mm	48
3.35 mm	45
2.00 mm	43
1.18 mm	41
630 µm	37
425 µm	33
300 µm	28
200 µm	19
150 µm	12
63 µm	6

Non Engineering Description

Brown silty very sandy fine to coarse GRAVEL

Sample Proportions - %

Cobbles	0.0
Gravel	56.7
Sand	37.4
Silt & Clay	5.9

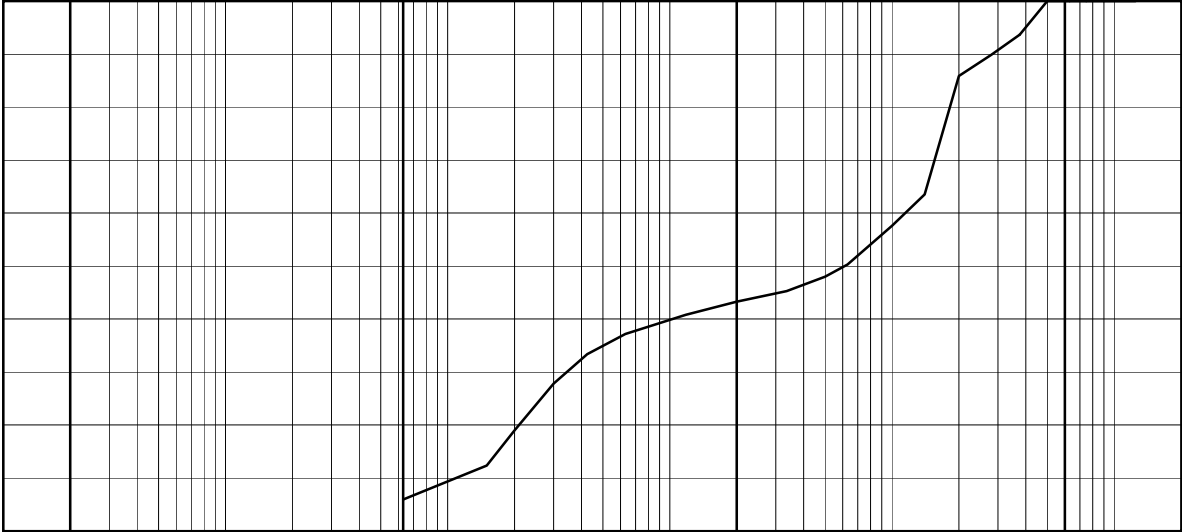
Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	50
D60	11
D10	0.11
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	100.0

Notes

Percentage Passing - %



Particle Size - mm

	Site LT521 FASNAKYLE 400KV SUBSTATION		Contract No 26560	
	Client SSEN Transmission		Hole TP33	
	Engineer Jacobs		Sample Ref Depth (m) 0.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	79
37.5 mm	75
28.0 mm	66
20.0 mm	59
14.0 mm	58
10.0 mm	55
6.30 mm	51
5.00 mm	49
3.35 mm	47
2.00 mm	42
1.18 mm	37
630 µm	30
425 µm	23
300 µm	16
200 µm	11
150 µm	6
63 µm	2

Non Engineering Description

Brown slightly silty very sandy fine to coarse GRAVEL

Sample Proportions - %

Cobbles	0.0
Gravel	57.9
Sand	39.6
Silt & Clay	2.4

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

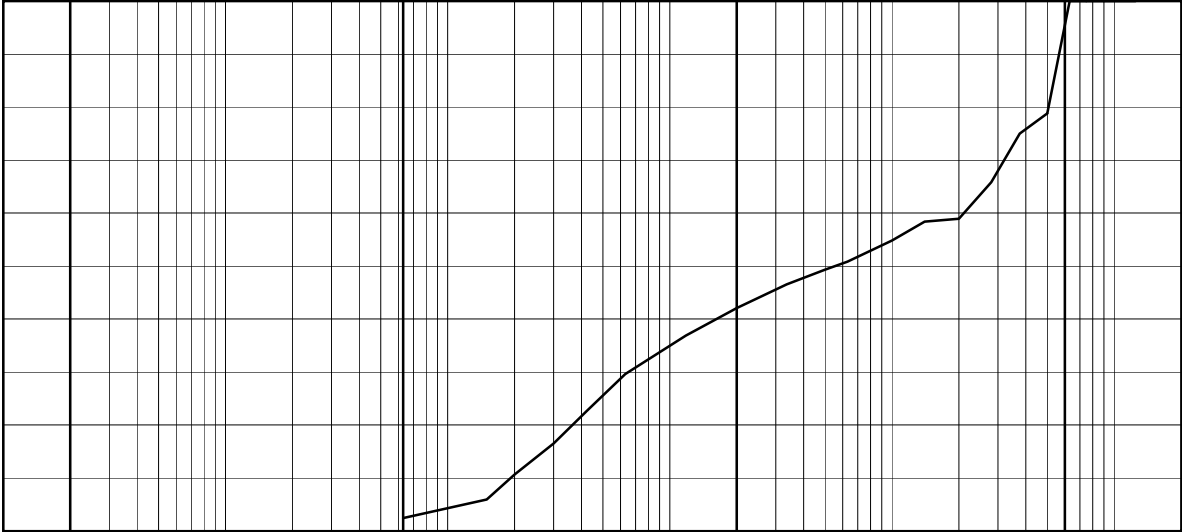
D100	63
D60	21
D10	0.19
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	110.5

Notes

Sample does not comply with BS EN ISO 17892-4 minimum mass requirements

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

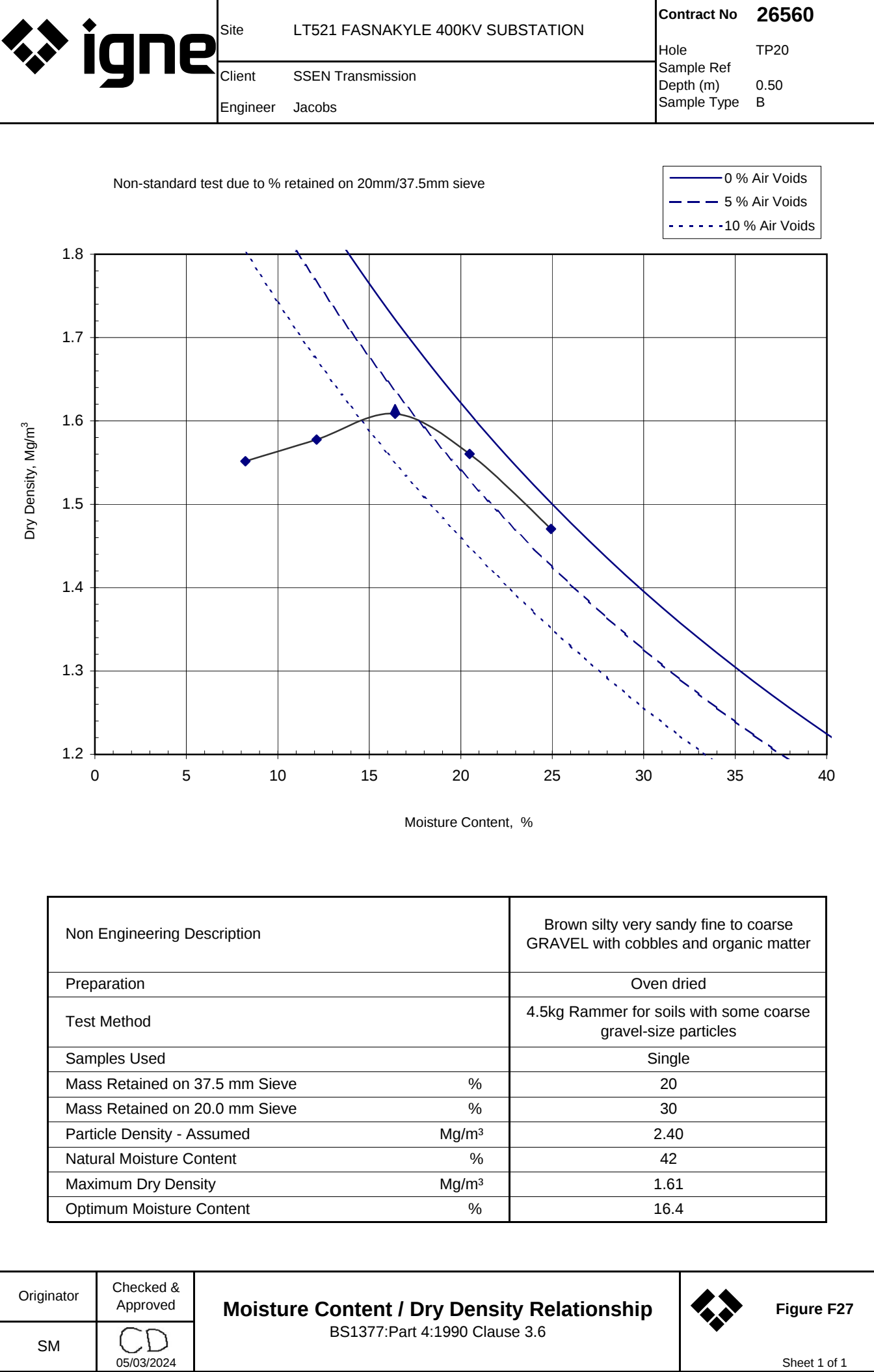
Percentage Passing - %

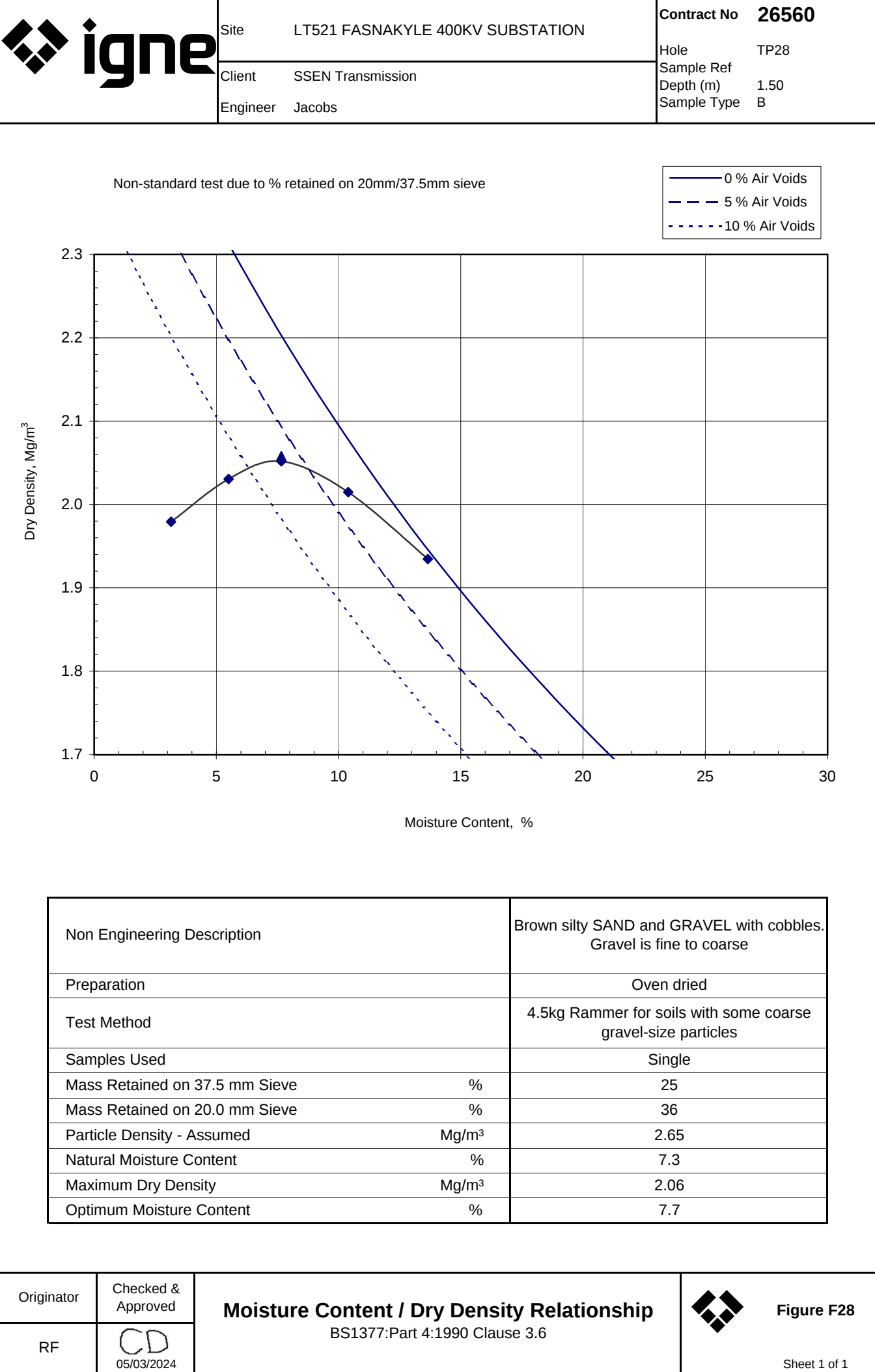


Particle Size - mm

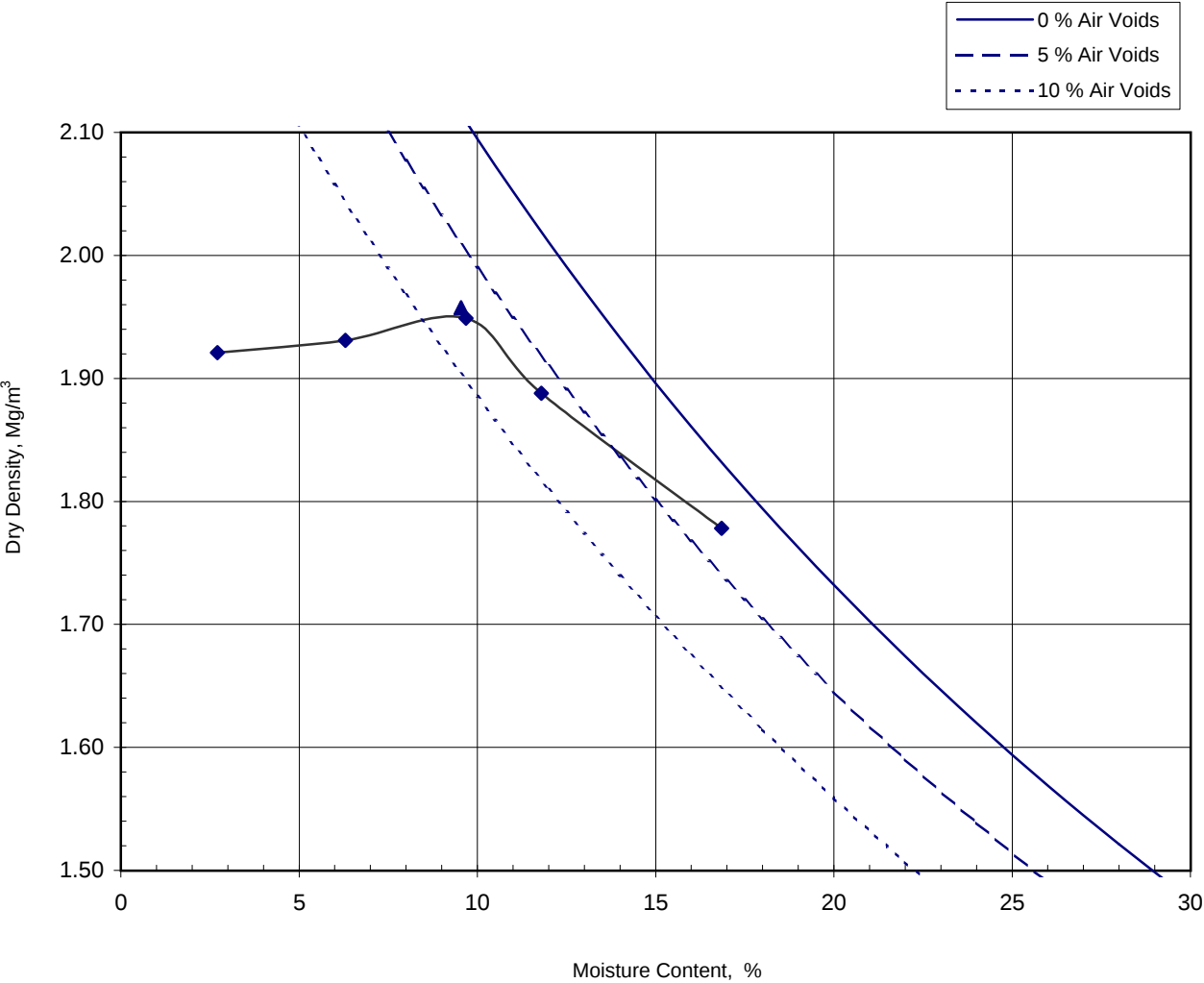
Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	Figure F24 Sheet 1 of 1
JM	CD 05/03/2024		

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	 Figure F25
SM	CD 05/03/2024		





	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole	TP32
	Engineer	Jacobs	Sample Ref	
			Depth (m)	0.50
			Sample Type	B



Non Engineering Description	Brown silty very sandy fine to coarse GRAVEL
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	6
Mass Retained on 20.0 mm Sieve	14
Particle Density - Assumed	2.65
Natural Moisture Content	13
Maximum Dry Density	1.96
Optimum Moisture Content	9.5

Originator	Checked & Approved	Moisture Content / Dry Density Relationship BS1377:Part 4:1990 Clause 3.6	 Figure F29
RF	 05/03/2024		
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SiteLT521 FASNAKYLE 400KV SUBSTATION

ClientSSEN Transmission

EngineerJacobs

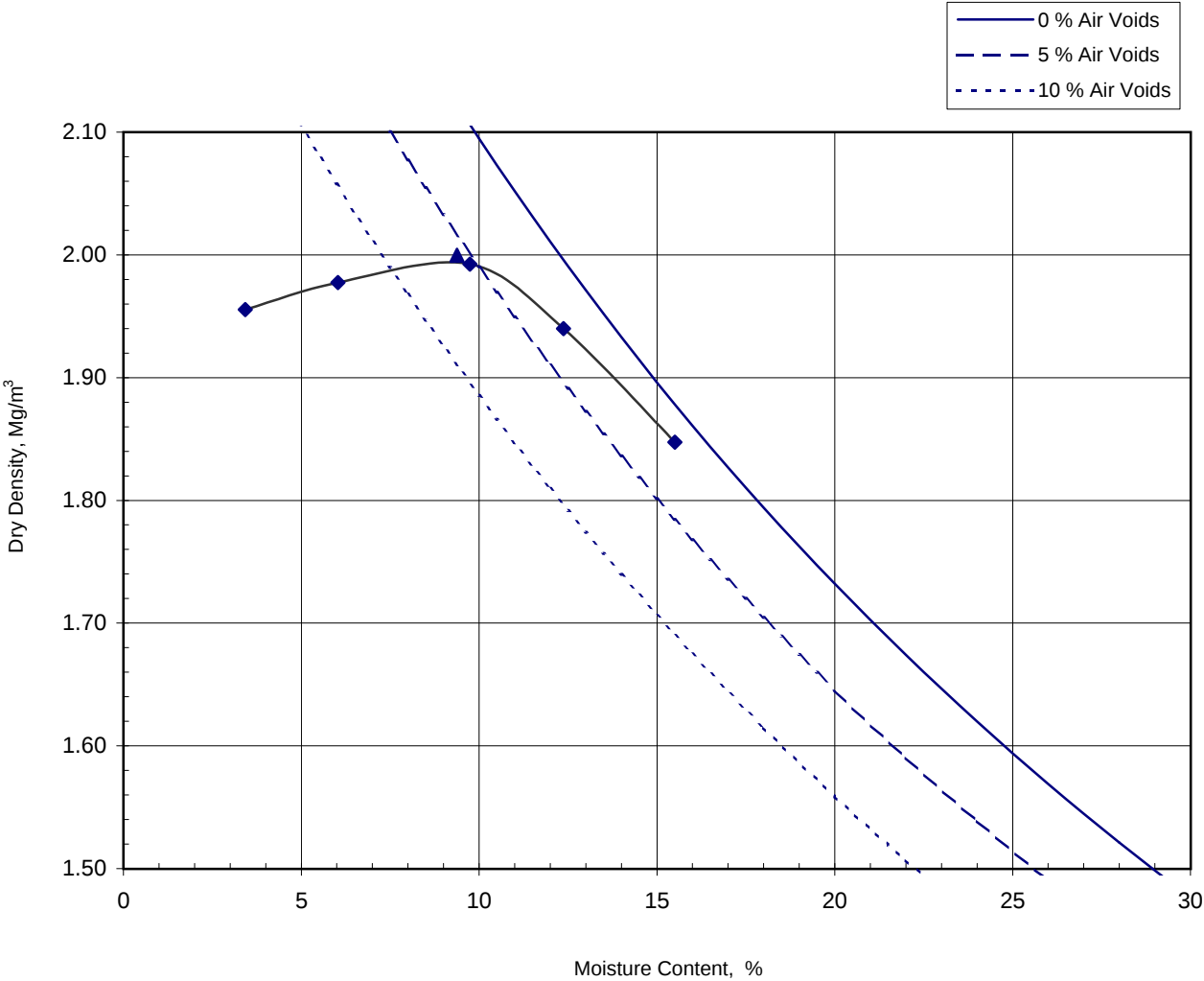
Contract No26560

HoleTP36A

Sample Ref

Depth (m)0.50

Sample TypeB



Non Engineering Description	Brown silty SAND and GRAVEL with organic material. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	%9
Mass Retained on 20.0 mm Sieve	%19
Particle Density - Assumed	Mg/m³2.65
Natural Moisture Content	%24
Maximum Dry Density	Mg/m³2.00
Optimum Moisture Content	%9.4

Originator

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RF


05/03/2024

Moisture Content / Dry Density Relationship

BS1377:Part 4:1990 Clause 3.6



Figure F30

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	TP28
	Engineer	Jacobs	Sample No	
			Depth (m)	1.50
			Sample Type	B

Non Engineering Description: Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 4.5kg compactive effort

Specimen Bulk Density 2.20 Mg/m³

Specimen Dry Density 2.01 Mg/m³

Mass of sample > 20 mm 36.0 %

Specimen Unsoaked

Test Details:

Top
 Surcharge: 2.0 kg
 Seating Load: 250 N
 Moisture Content: 9.4 %

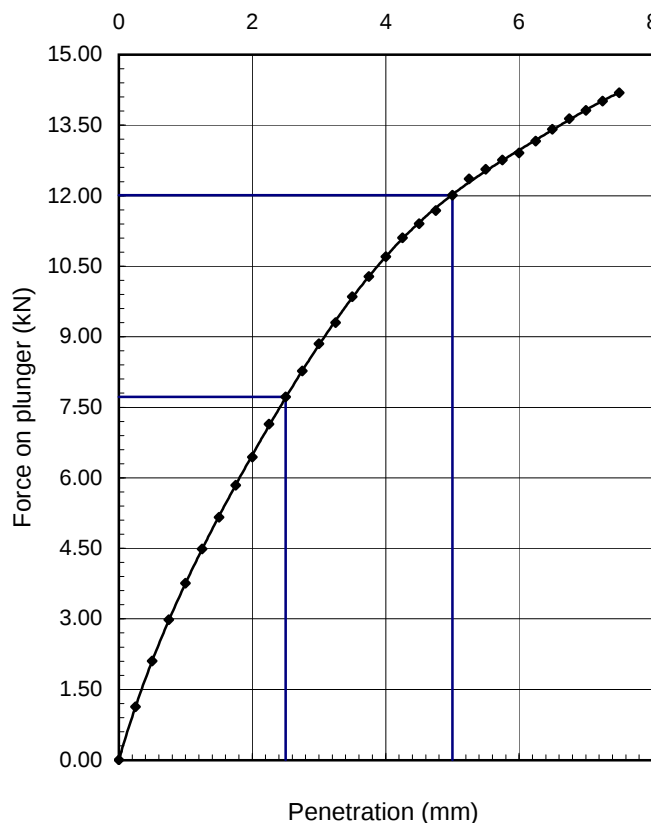
Base

2.0 kg
 250 N
 9.5 %

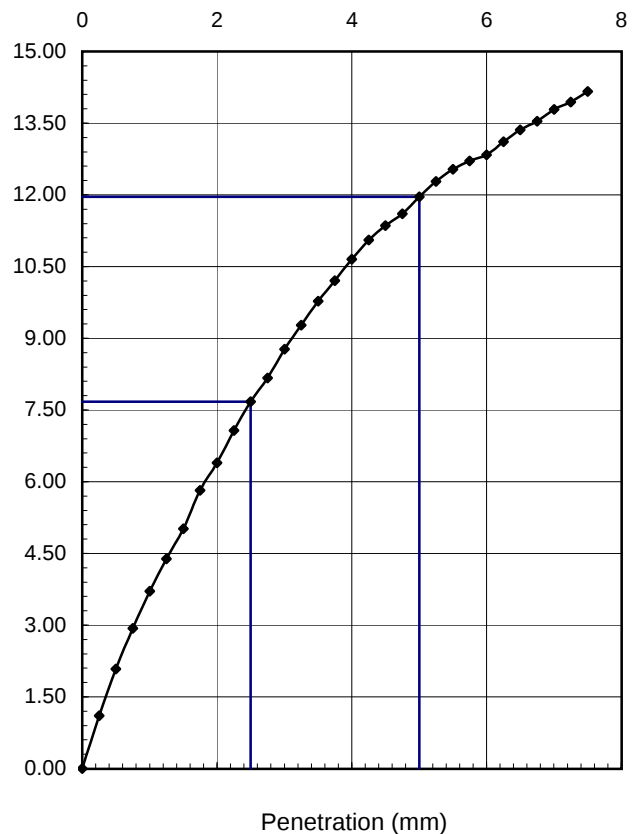
CBR Value: 60.0 %

59.8 %

Top of Specimen
Penetration (mm)



Base of Specimen
Penetration (mm)



Non-standard test due to % retained on 20mm sieve

Originator	Checked & Approved	CALIFORNIA BEARING RATIO BS1377 : Part 4 : Clause 7 : 1990	 Figure No F31
DW	CD 05/03/2024		



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Hole ID TP32

Sample No

Depth (m) 0.50

Sample Type B

Non Engineering Description: Brown silty very sandy fine to coarse GRAVEL

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 4.5kg compactive effort

Specimen Bulk Density 2.05 Mg/m³Specimen Dry Density 1.75 Mg/m³

Mass of sample > 20 mm 13.6 %

Specimen Unsoaked

Test Details:**Top**

Surcharge: 2.0 kg

Seating Load: 10 N

Moisture Content: 17 %

Base

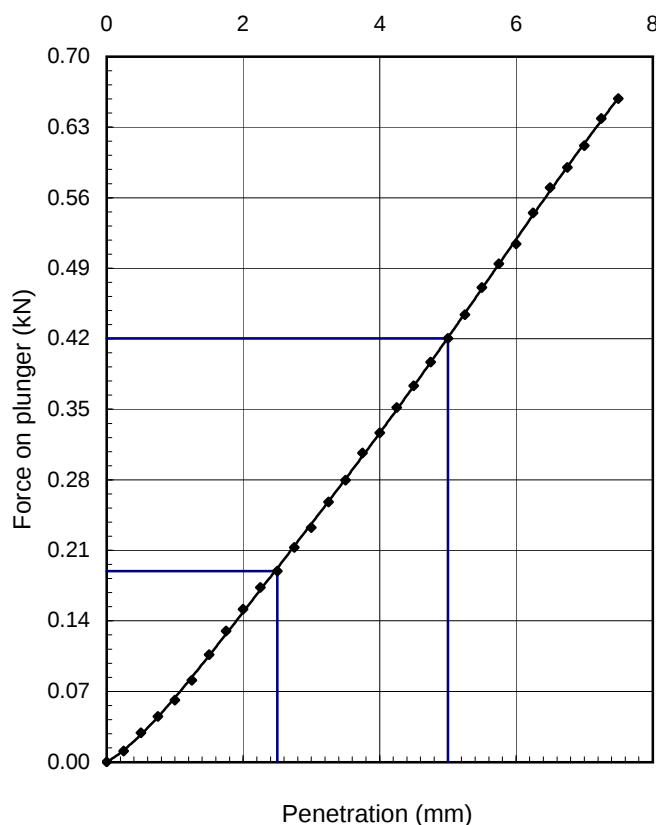
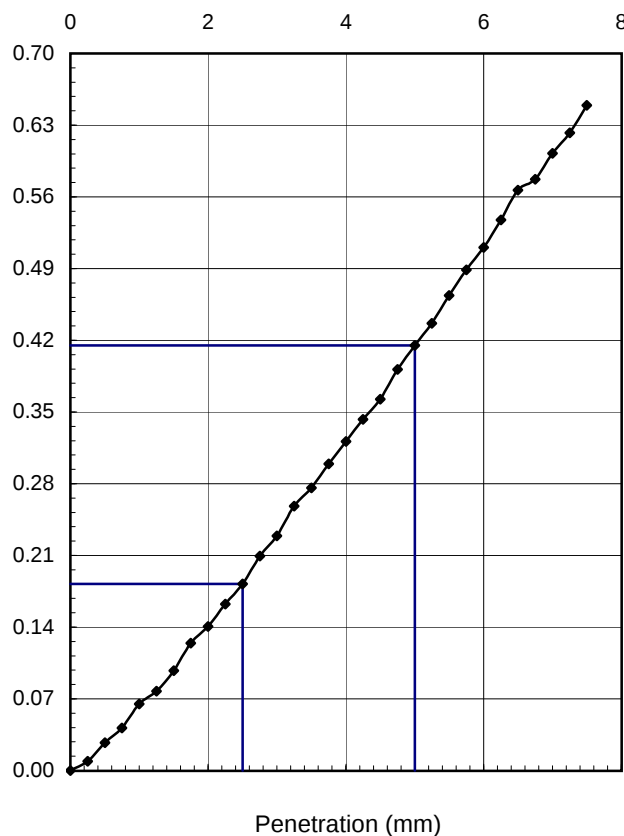
2.0 kg

10 N

17 %

CBR Value: 2.1 %

2.1 %

Top of Specimen
Penetration (mm)Base of Specimen
Penetration (mm)

Non-standard test due to % retained on 20mm sieve

Originator

Checked &
Approved

DW

CD
05/03/2024**CALIFORNIA BEARING RATIO**

BS1377 : Part 4 : Clause 7 : 1990



Figure No F32

Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Hole ID TP36A

Sample No

Depth (m) 0.50

Sample Type B

Non Engineering Description:

Brown silty SAND and GRAVEL with organic material. Gravel is fine to coarse

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 4.5kg compactive effort

Specimen Bulk Density 2.20 Mg/m³Specimen Dry Density 1.79 Mg/m³

Mass of sample > 20 mm 20.0 %

Specimen Unsoaked

Test Details:**Top**

Surcharge: 2.0 kg

Seating Load: 50 N

Moisture Content: 23 %

Base

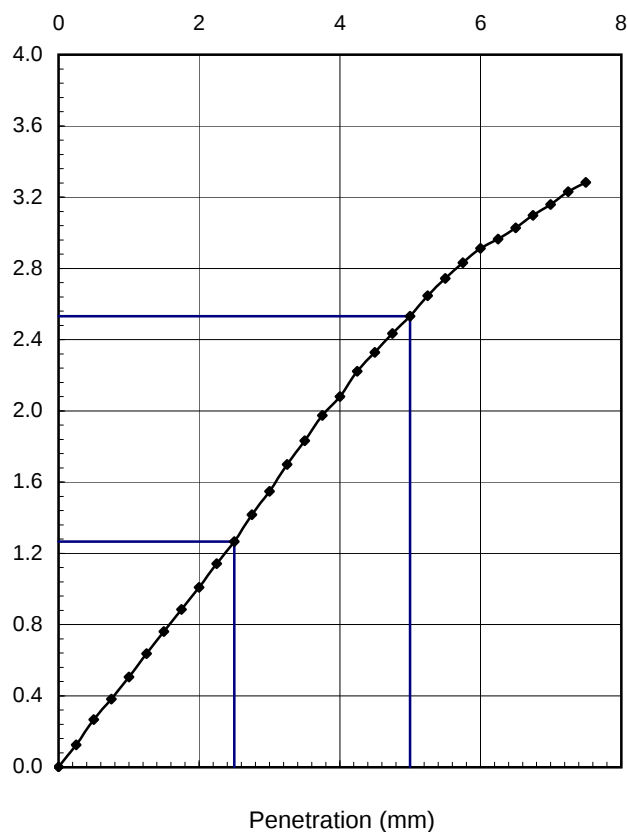
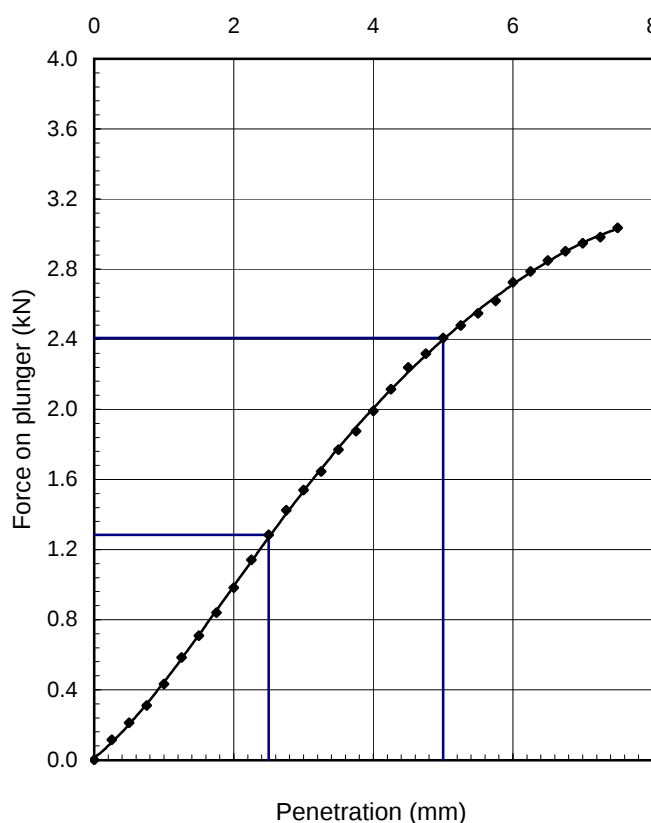
2.0 kg

50 N

24 %

CBR Value: 12.0 %

12.7 %

Top of Specimen
Penetration (mm)Base of Specimen
Penetration (mm)

Originator

Checked &
Approved

SM

CD
05/03/2024**CALIFORNIA BEARING RATIO**

BS1377 : Part 4 : Clause 7 : 1990



Figure No F33

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION		Contract No	26560
	Client	SSEN Transmission		Hole ID	BH17
	Engineer	Jacobs		Sample Ref	
				Depth	1.20-2.20
				Sample Type	U

Non Engineering Description:

Dark brown fibrous PEAT

Initial Water Content	110 %	Final Water Content	88.6 %
Initial Voids Ratio	2.877	Final Voids Ratio	2.094
Initial Bulk Density	1.44 Mg/m ³	Specific Gravity	2.65 (assumed)
Initial Dry Density	0.68 Mg/m ³	Degree of saturation	102 %
Specimen Dimensions	20.07mm x 74.70mm dia		
Laboratory temperature	20±2°C		

Pressure Range kPa	M _v m ² /MN	C _v (t90) m ² /year	C _v (t50) m ² /year	Voids ratio (e)	C _{sec}
0 - 10	6.886	2.56	2.44	2.610	
10 - 20	3.462	0.81	0.91	2.485	
20 - 40	2.411	1.51	1.58	2.317	
40 - 80	2.024	1.38	1.47	2.049	
80 - 40	0.179	swelled	swelled	2.070	
40 - 20	0.378	swelled	swelled	2.094	

Voids Ratio (e)

3.000

2.500

2.000

1.500

1.000

0.500

0.000

Effective Pressure (kPa)

1

10

100

1000

2.5

2.0

1.5

1.0

0.5

0

Coefficient of Consolidation m²/yr

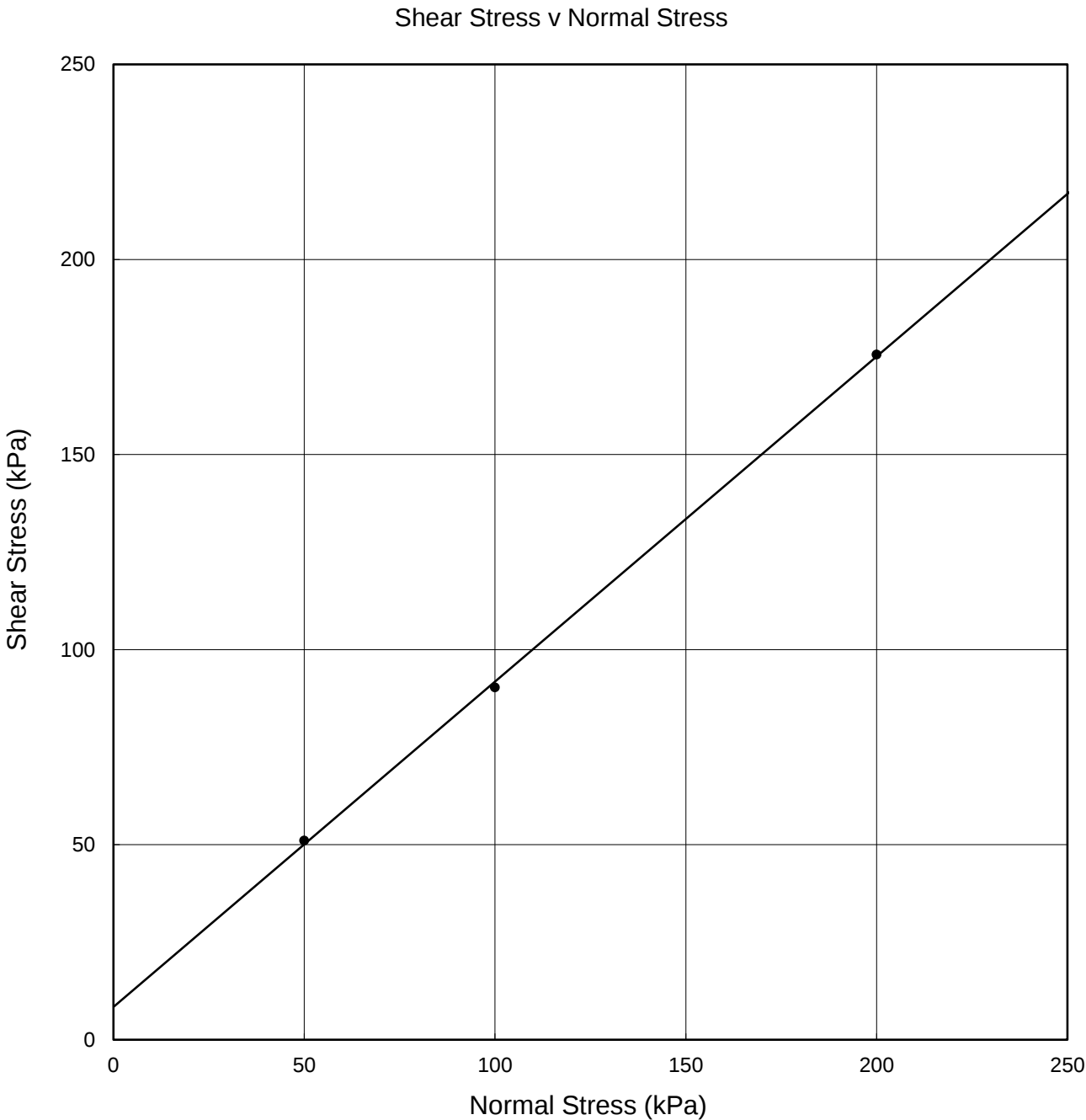
Originator	Checked & Approved	INCREMENTAL LOADING OEDOMETER TEST BS EN ISO 17892-5:2017, Root time curve fitting	 Figure No F34
SG	CD 05/03/2024		

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION			Contract No.	26560
	Client	Terra Tek Ltd - Airdrie			Hole ID	TP28
	Engineer				Depth(m)	1.5
					Sample Type	B
Specimen Details						
Depth within original sample		n/a				
Orientation within original sample		n/a				
Test condition		Non-Submerged				
Description		Brown slightly silty gravelly SAND. Gravel is fine to coarse.				
Preparation		Material >20mm removed (77% passing). Remoulded to 90% of the Maximum Dry Density (MDD = 2.06Mg/m ³) at the Optimum Moisture Content (OMC = 7.7%)				
Specimen Number		1	2	3		
Length	mm	308.3	308.3	308.3		
Width	mm	308.0	308.0	308.0		
Height	mm	143.0	143.0	143.0		
Initial water content	%	8.1	8.1	8.1		
Initial bulk density	Mg/m ³	2.00	2.00	2.00		
Initial dry density	Mg/m ³	1.85	1.85	1.85		
Particle Density (assumed)	Mg/m ³	2.65	2.65	2.65		
Application Pressure Stage						
Normal stress	kPa	50	100	200		
Height change	mm	-0.8	-2.8	-3.1		
Duration	day(s)	-	-	-		
Shearing Stage						
Normal stress	kPa	50	100	200		
Peak Conditions:						
Rate of horizontal displacement	mm/min	1.02	1.02	1.02		
Maximum shear stress	kPa	51	90	176		
Horizontal displacement	mm	19.0	42.6	24.0		
Height change	mm	0.8	-3.3	-0.6		
Residual Conditions:						
Rate of horizontal displacement	mm/min	n/a	n/a	n/a		
Residual shear stress	kPa	n/a	n/a	n/a		
Final cumulative displacement	mm	n/a	n/a	n/a		
Total traverses	No.	n/a	n/a	n/a		
Method of reversal		n/a	n/a	n/a		
Final water content	%	8.1	8.1	8.1		
Duration	day(s)	1	1	1		
Shear Strength Parameters						
Maximum Condition: (linear tangent interpretation)						
Effective Cohesion	kPa	8				
Effective Angle of Shearing Resistance	degrees	40				
Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox)				Figure F35
VB	<i>Jan</i> 05/03/2024					
		BS EN ISO 17892-10:2018			Sheet 1 of 5	



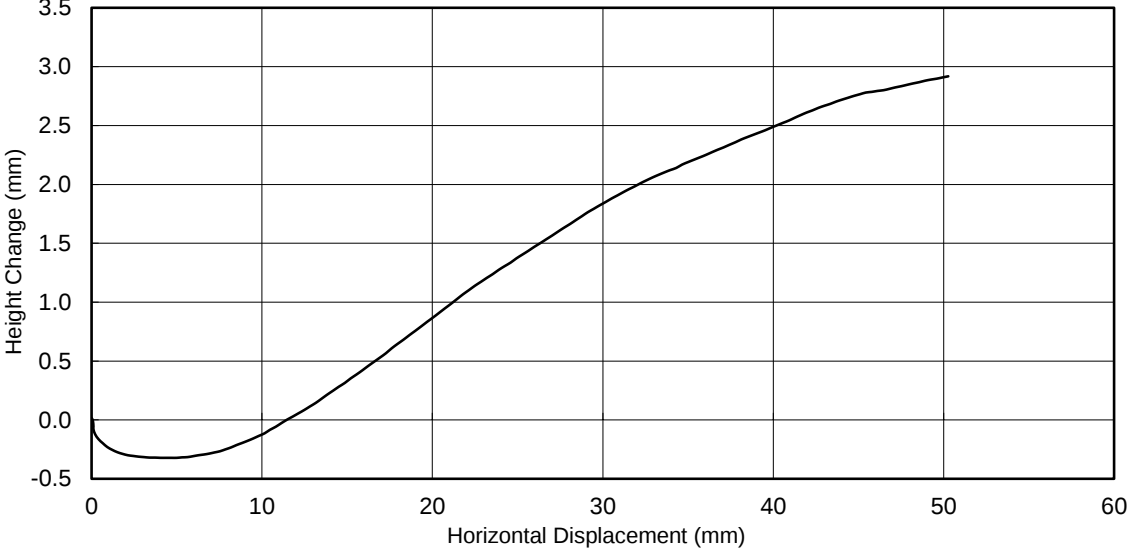
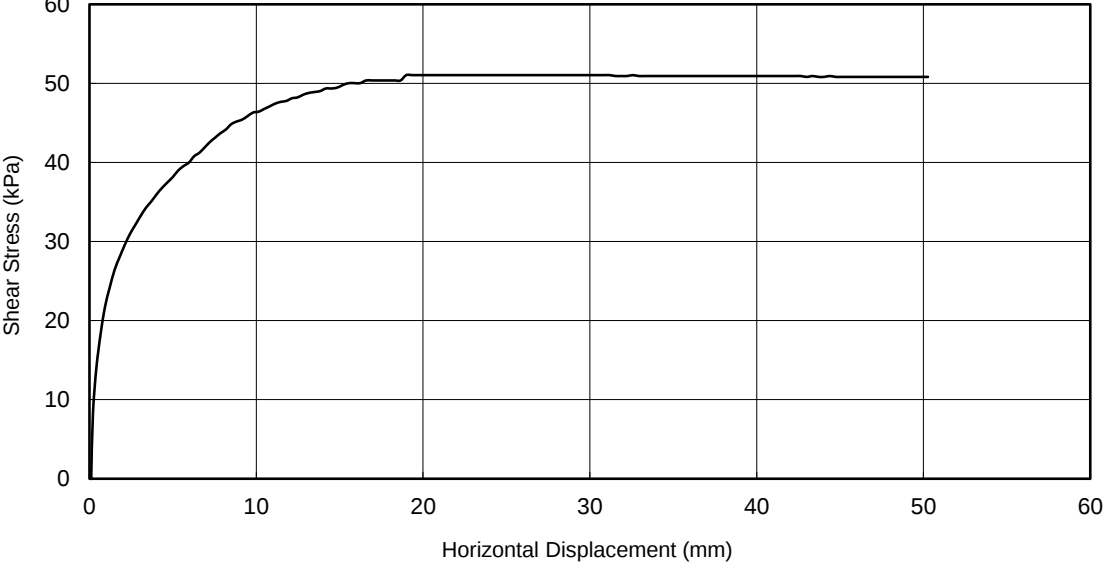
Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No.	26560
Client	Terra Tek Ltd - Airdrie	Hole ID	TP28
Engineer		Depth(m)	1.5
		Sample Type	B



Shear Strength Parameters (linear tangent interpretation)

$c' = 8 \text{ kPa}$
 $\phi' = 40^\circ$

Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox)	 Figure F35
VB	<i>dar</i> 05/03/2024		
		BS EN ISO 17892-10:2018	Sheet 2 of 5

		Site LT521 FASNAKYLE 400KV SUBSTATION	Contract No. 26560
		Client Terra Tek Ltd - Airdrie	Hole ID TP28
		Engineer	Depth(m) 1.5
			Sample Type B
Specimen No. 1			Normal Pressure = 50 kPa
Height Change v Horizontal Displacement			
			
Shear Stress v Horizontal Displacement			
			
Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox) BS EN ISO 17892-10:2018	
VB	 05/03/2024		
			Figure F35 Sheet 3 of 5

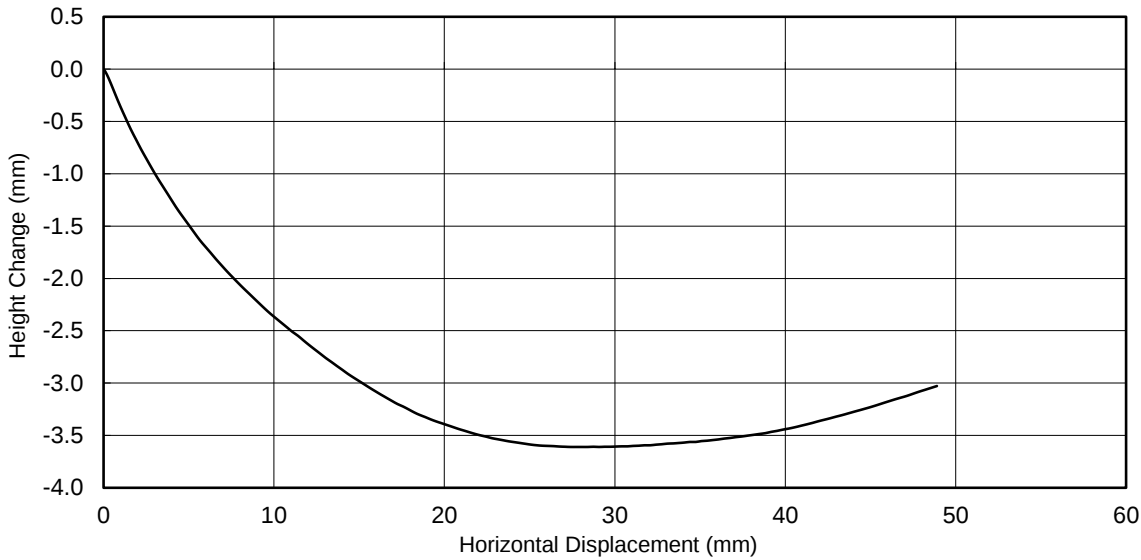


Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No.	26560
Client	Terra Tek Ltd - Airdrie	Hole ID	TP28
Engineer		Depth(m)	1.5
		Sample Type	B

Specimen No. 2

Normal Pressure = 100 kPa

Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox)	 Figure F35
VB	<i>dar</i> 05/03/2024		
		BS EN ISO 17892-10:2018	Sheet 4 of 5

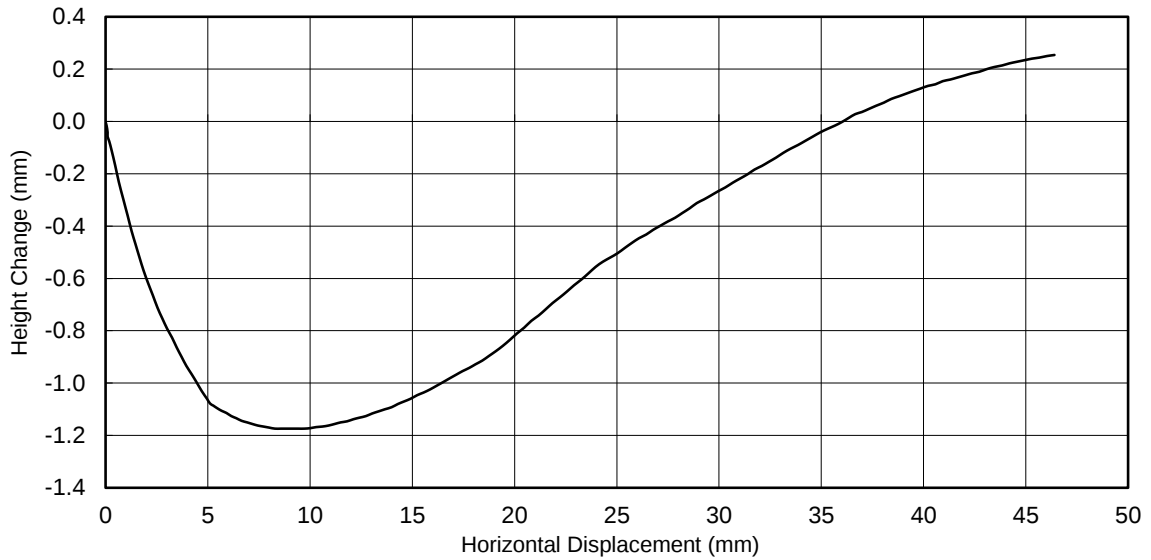


Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No.	26560
Client	Terra Tek Ltd - Airdrie	Hole ID	TP28
Engineer		Depth(m)	1.5
		Sample Type	B

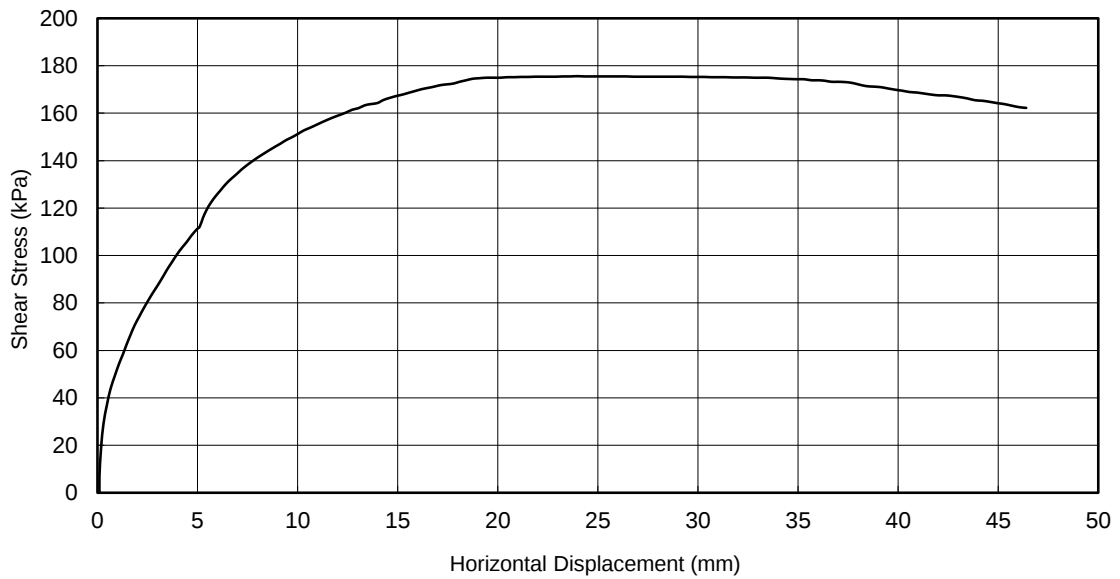
Specimen No. 3

Normal Pressure = 200 kPa

Height Change v Horizontal Displacement

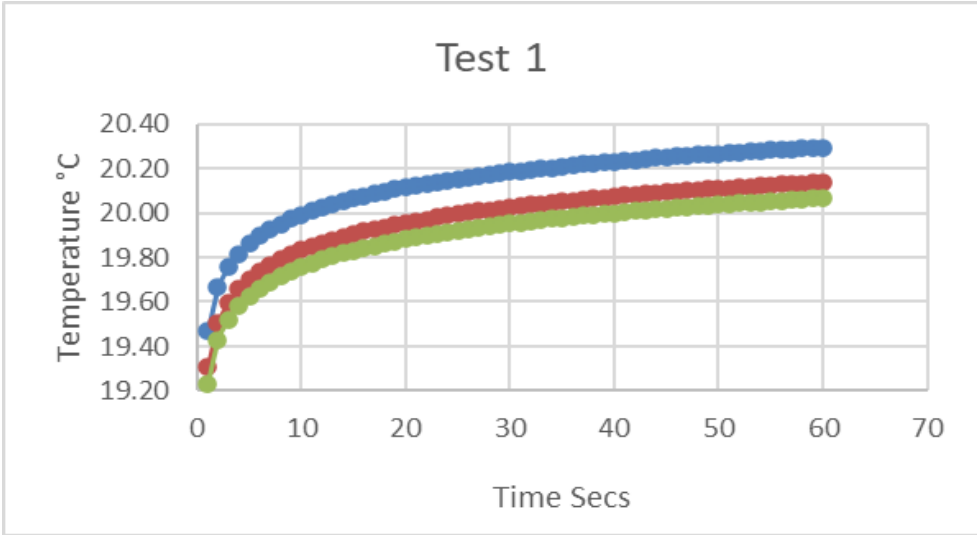
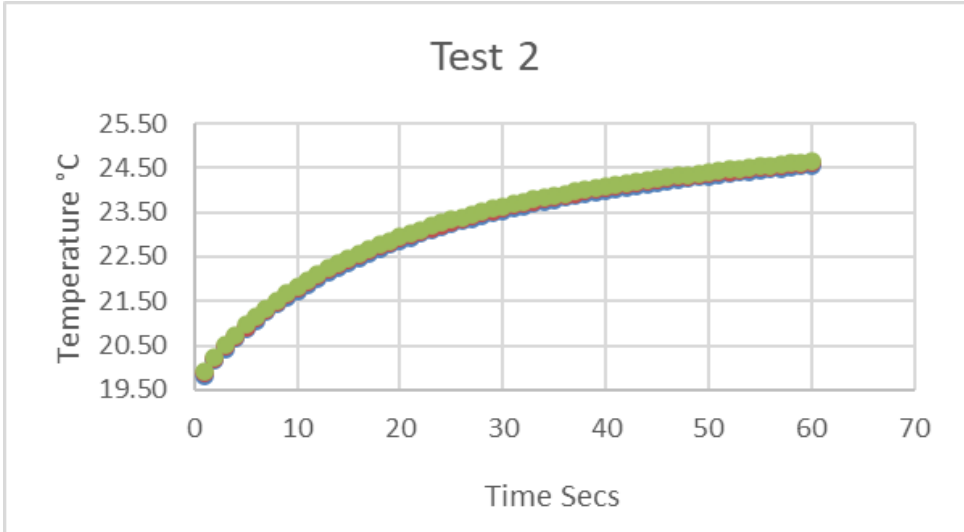


Shear Stress v Horizontal Displacement



Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox) BS EN ISO 17892-10:2018	 Figure F35
VB	<i>dar</i> 05/03/2024		

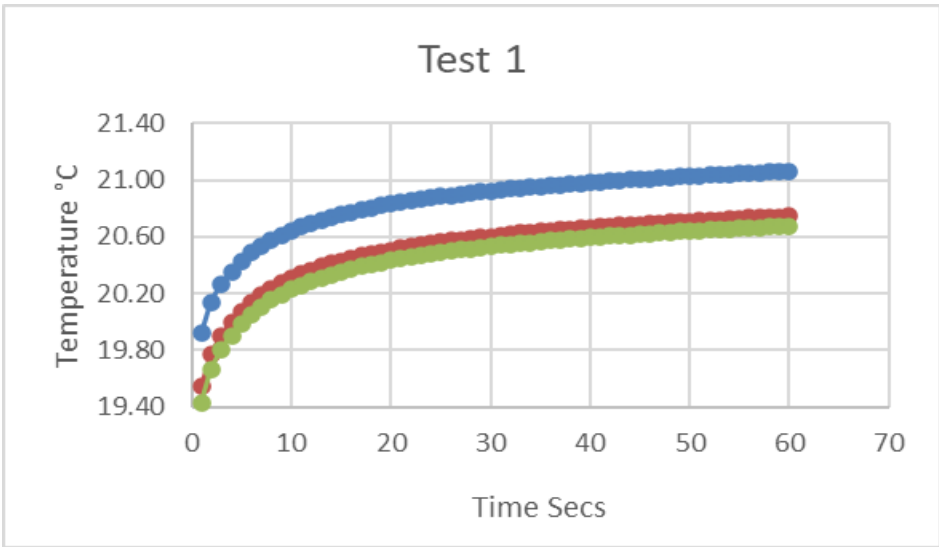
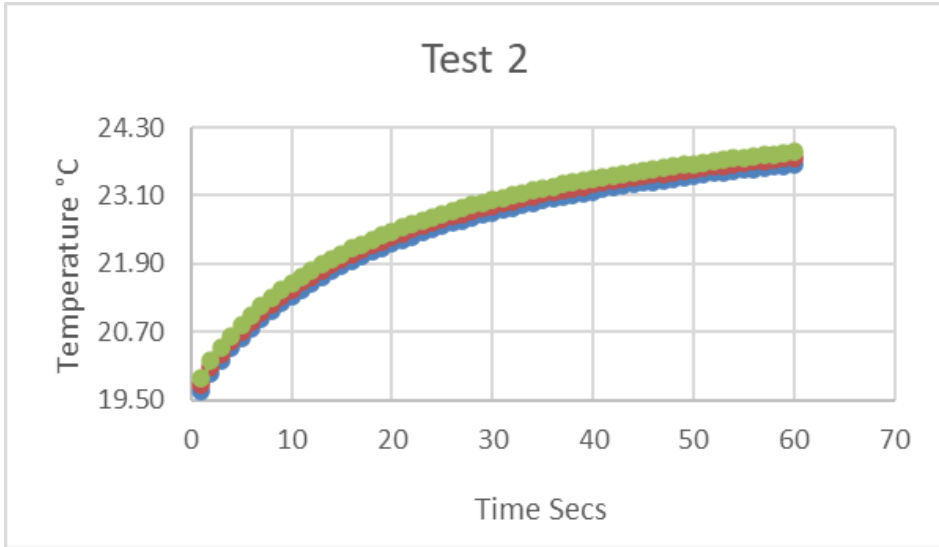
				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP01	1.00		B	2013182	Soil	Recompacted	10	15.4	126.81	152.12	4929.77	2.14	1.85	18.68	Hand Pushed	60.0	0.83	1.01	1.81	0.55	Grey slightly sandy gravelly SILT/CLAY. Gravel is fine to coarse	
TP01	1.00		B	2013182	Soil	Recompacted	10	0.4	109.71	151.96	3640.82	1.83	1.82	19.20	Hand Pushed	60.0	4.72	1.02	0.23	4.32	Grey slightly sandy gravelly SILT/CLAY. Gravel is fine to coarse	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F36	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F36

- A15075-2-2013189.xls

Lab Project No A15075-2 : 05/03/2024 16:18:15

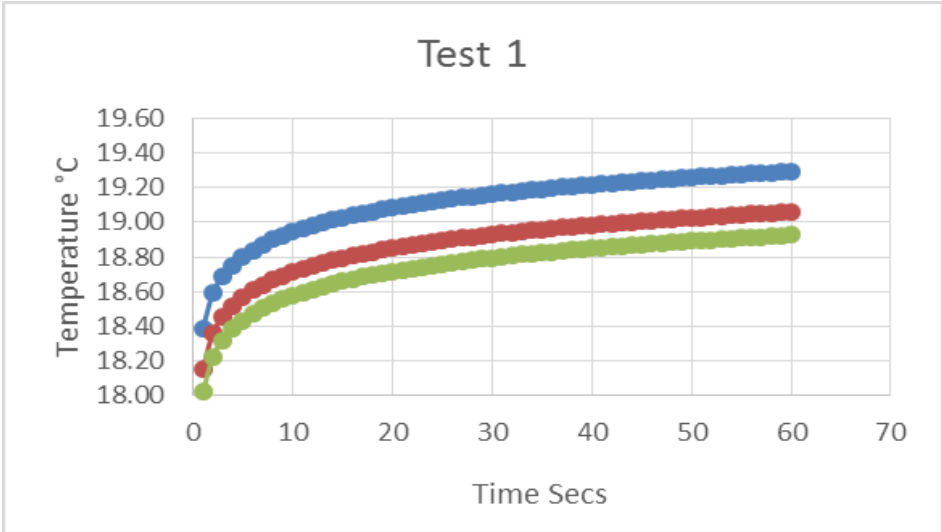
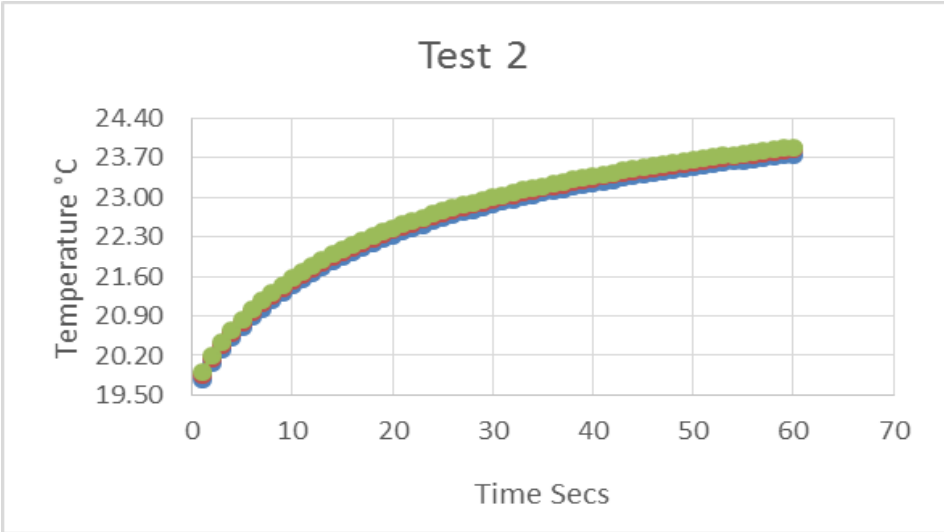
				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP08	0.30		B	2013189	Soil	Recompacted	21	21.5	127.11	151.96	4528.63	1.96	1.61	18.97	Hand Pushed	60.0	1.20	1.01	1.68	0.59	Greyish brown sandy gravelly CLAY. Gravel is fine to coarse.	
TP08	0.30		B	2013189	Soil	Recompacted	21	0.1	127.55	152.19	4073.66	1.76	1.76	19.09	Hand Pushed	60.0	3.98	1.01	0.28	3.59	Greyish brown sandy gravelly CLAY. Gravel is fine to coarse.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F37	

	Site		LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client		SSEN Transmission	
	Engineer		Jacob's	
Test 1  Test 2 				
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022		Page 2 of 2
MAB	 05/03/2024			Figure F37

- A15075-1-2012863.xls

Lab Project No A15075-1 : 05/03/2024 16:18:15

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP10	1.00		B	2012883	Soil	Recompacted	7.5	27.7	126.78	152.32	4377.13	1.89	1.48	17.53	Hand Pushed	60.0	0.90	1.01	1.54	0.65	Dark grey sandy gravelly SILT. Gravel is fine to coarse.	
TP10	1.00		B	2012883	Soil	Recompacted	7.5	0.7	126.81	152.12	3500.21	1.52	1.51	19.16	Hand Pushed	60.0	3.99	1.01	0.24	4.10	Dark grey sandy gravelly SILT. Gravel is fine to coarse.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F38	

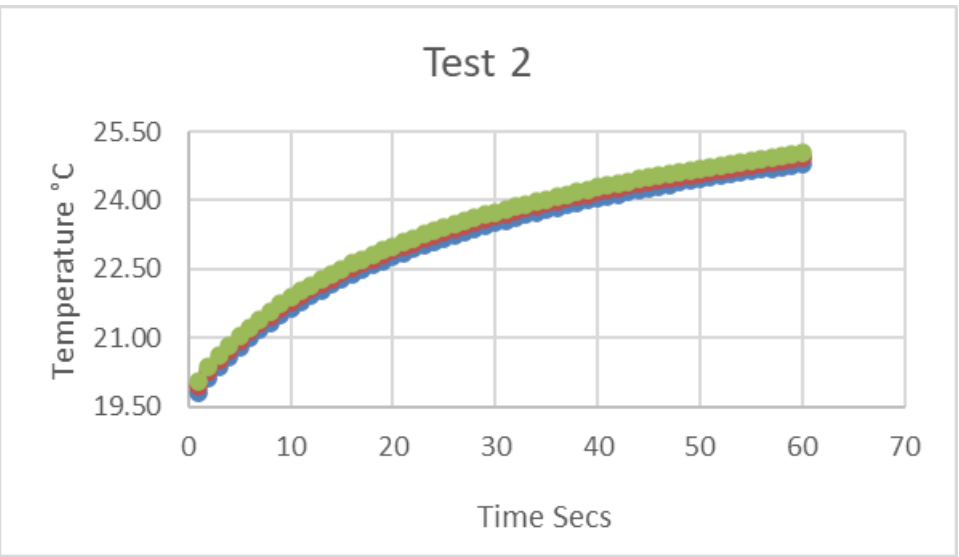
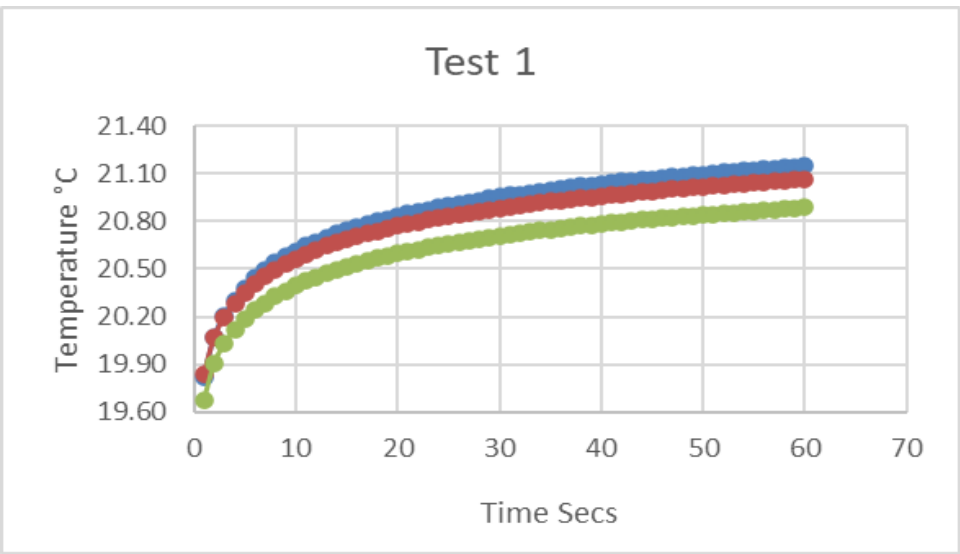
	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F38

- A15075-2-2013194.xls

Lab Project No A15075-2 : 05/03/2024 16:18:15

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP12	0.50		B	2013194	Soil	Recompacted	19	39.2	127.26	151.66	4142.90	1.80	1.29	19.08	Hand Pushed	60.0	1.26	1.01	1.39	0.74	Brown slightly sandy gravelly CLAY. Gravel is fine to coarse.	
TP12	0.50		B	2013194	Soil	Recompacted	19	0.8	127.26	151.66	3219.08	1.40	1.39	19.25	Hand Pushed	60.0	4.98	1.02	0.16	6.37	Brown slightly sandy gravelly CLAY. Gravel is fine to coarse.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F39	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	

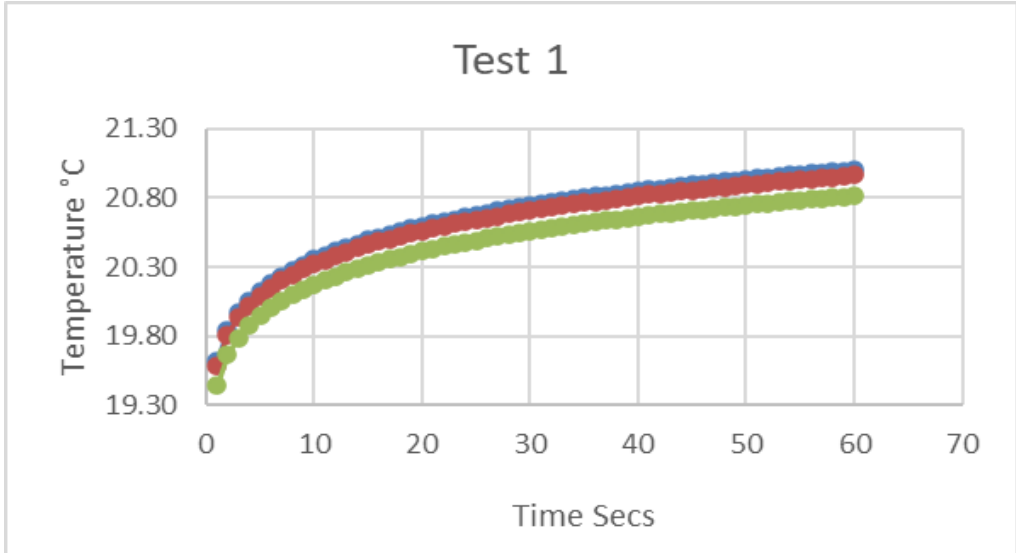
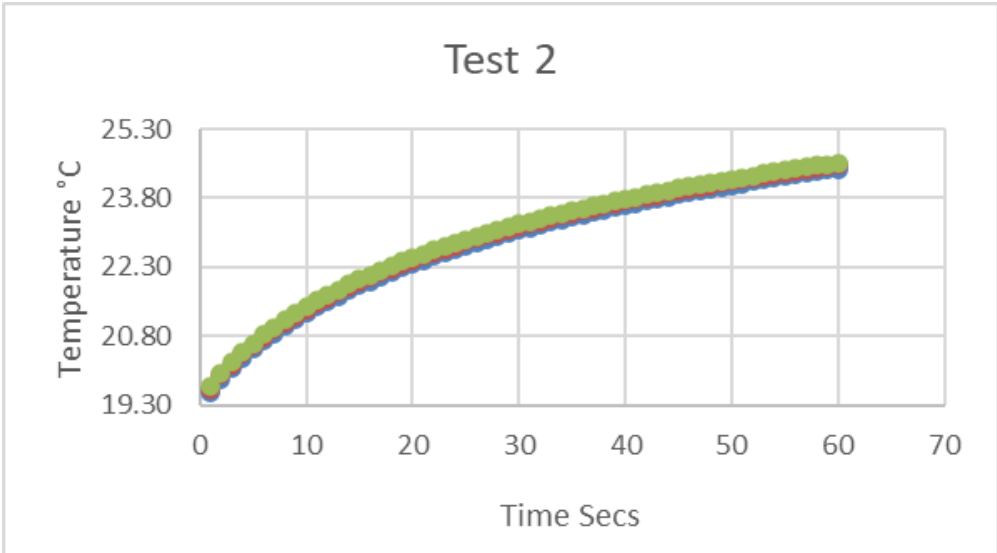


Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F39

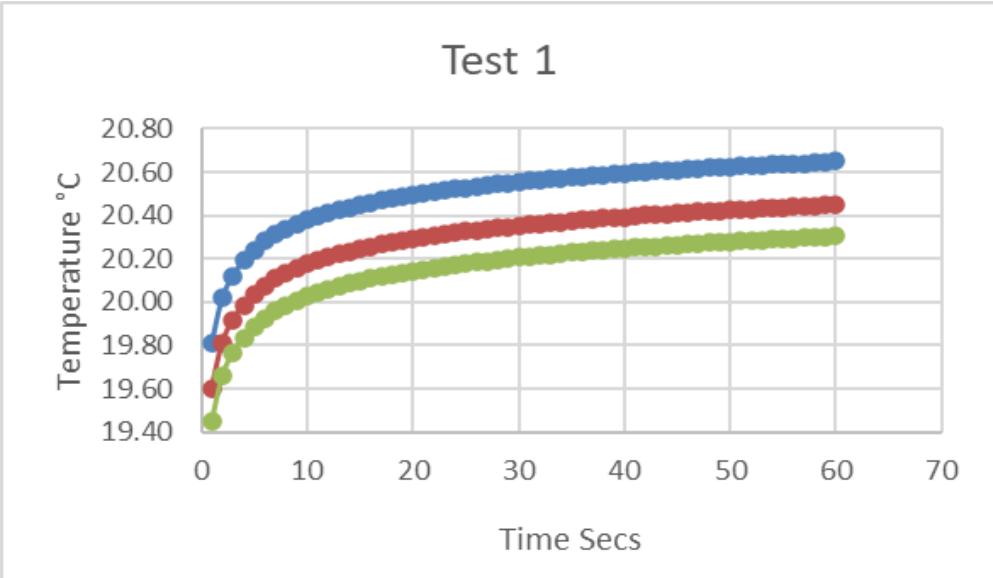
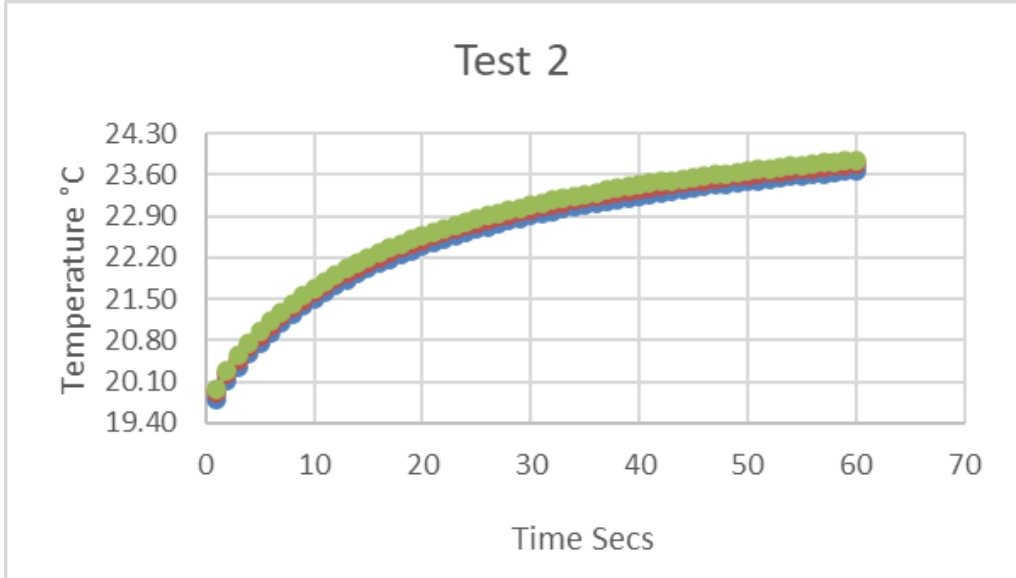
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Lab Project No A15075-2 : 05/03/2024 16:18:15

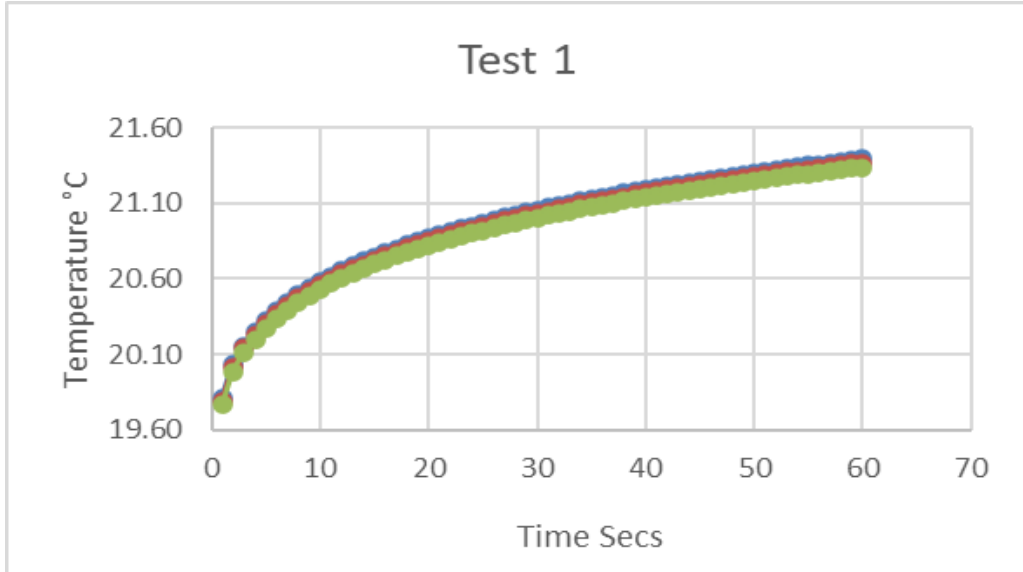
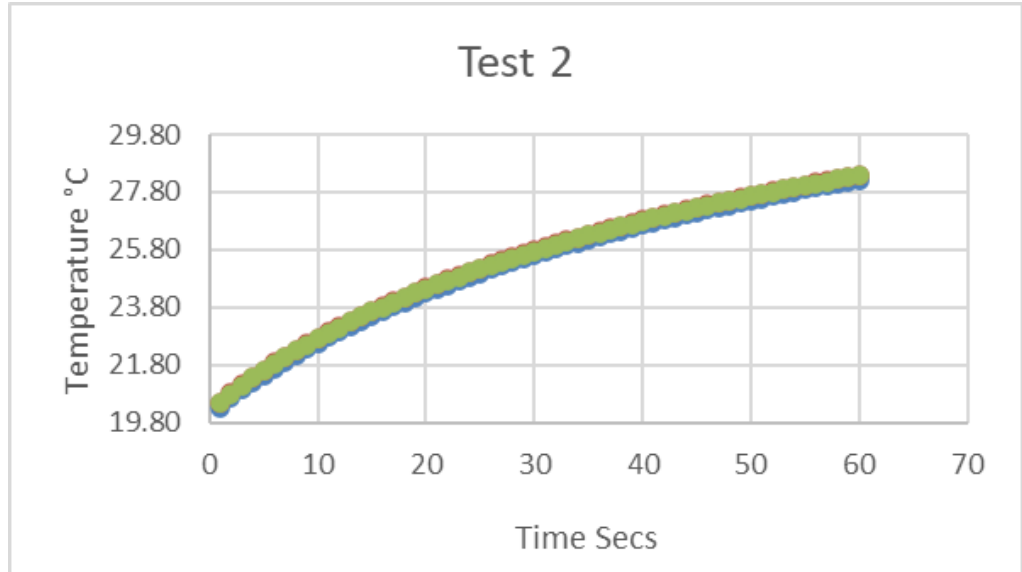
				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP13	0.40		B	2013197	Soil	Recompacted	1	145.8	127.55	152.19	2864.75	1.23	0.50	18.89	Hand Pushed	60.0	1.38	1.02	0.77	1.30	Brown ORGANIC MATERIAL with many rootlets.	
TP13	0.40		B	2013197	Soil	Recompacted	1	2.5	127.55	152.19	2369.27	1.02	1.00	18.96	Hand Pushed	60.0	4.87	1.01	0.14	7.20	Brown ORGANIC MATERIAL with many rootlets.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F40	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F40

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP14	0.50		B	2013199	Soil	Recompacted	29	12.1	127.03	152.07	5072.08	2.20	1.96	18.96	Hand Pushed	60.0	0.85	1.01	2.16	0.46	Brown slightly clayey gravely SAND. Gravel is fine to coarse.	
TP14	0.50		B	2013199	Soil	Recompacted	29	0.2	127.26	151.66	4570.00	1.99	1.99	19.21	Hand Pushed	60.0	3.86	1.01	0.31	3.17	Brown slightly clayey gravely SAND. Gravel is fine to coarse.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F41	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560	
	Client	SSEN Transmission		
	Engineer	Jacob's		
Test 1  Test 2 				
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022		Page 2 of 2
MAB	 05/03/2024			Figure F41

				Site LT521 FASNAKYLE 400KV SUBSTATION																Contract No 26560	
				Client SSEN Transmission																	
				Engineer Jacob's																	
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description
Hole	Depth m	Spec. Ref.	Sample Type																		
TP15	1.00		B	2013201	Soil	Recompacted	2	458.8	126.81	152.12	2276.86	0.99	0.18	19.13	Hand Pushed	60.0	1.58	1.01	0.55	1.77	Very dark brown organic matter
TP15	1.00		B	2013201	Soil	Recompacted	2	5.8	127.11	151.96	1294.31	0.56	0.53	19.76	Hand Pushed	60.0	7.90	1.01	0.06	16.66	Very dark brown organic matter
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U	
Originator	Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																		Page 1 of 2
MAB	 05/03/2024																				Figure F42

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	
MAB	 05/03/2024		

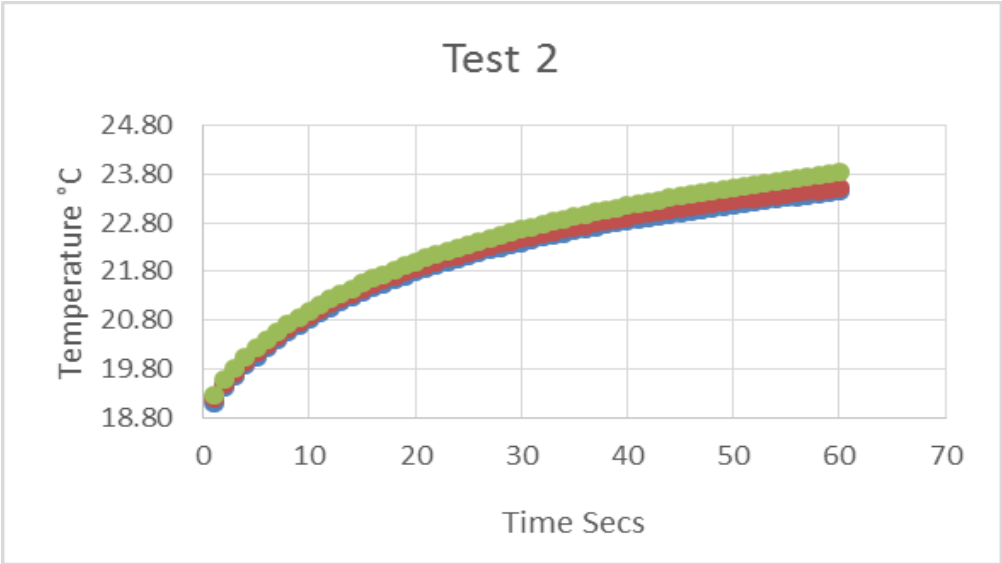
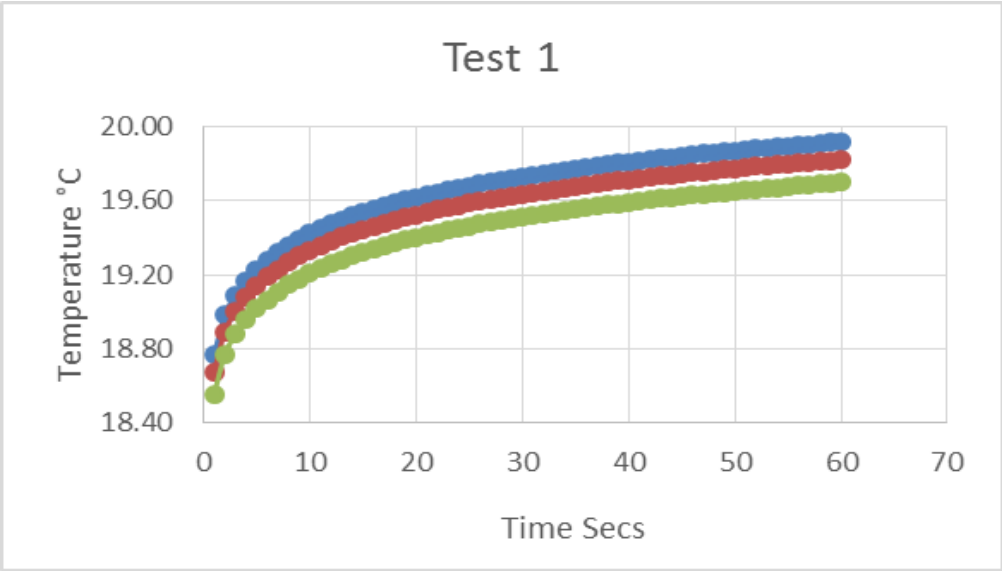
- A15075-1-2012888.xls

Lab Project No A15075-1 : 05/03/2024 16:18:15

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP20	0.50		B	2012888	Soil	Recompacted	44	52.1	127.18	151.94	3699.81	1.60	1.05	18.01	Hand Pushed	60.0	1.14	1.01	1.11	0.89	Very dark brown very organic slightly sandy fine to coarse GRAVEL.	
TP20	0.50		B	2012888	Soil	Recompacted	44	1.2	126.89	152.34	3239.41	1.40	1.38	18.51	Hand Pushed	60.0	4.40	1.02	0.19	5.22	Very dark brown very organic slightly sandy fine to coarse GRAVEL.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F43	



Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
Client	SSEN Transmission	
Engineer	Jacob's	

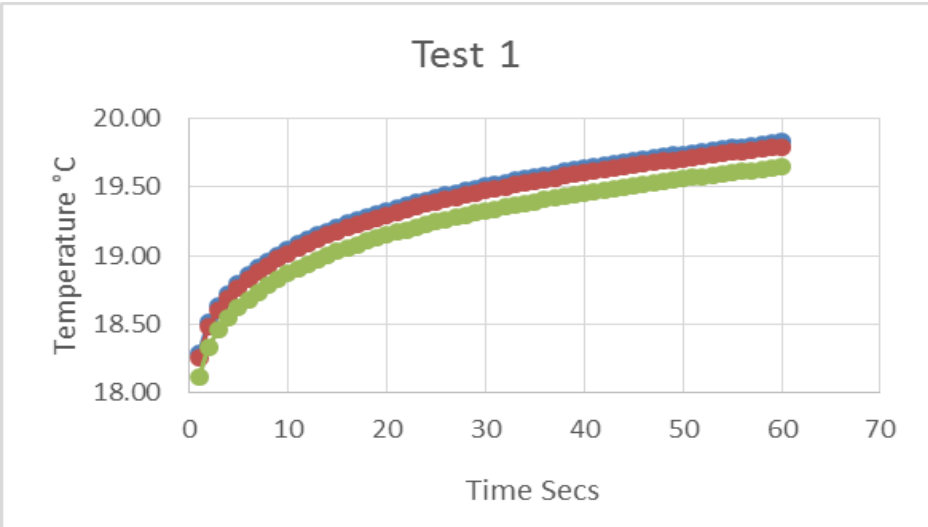
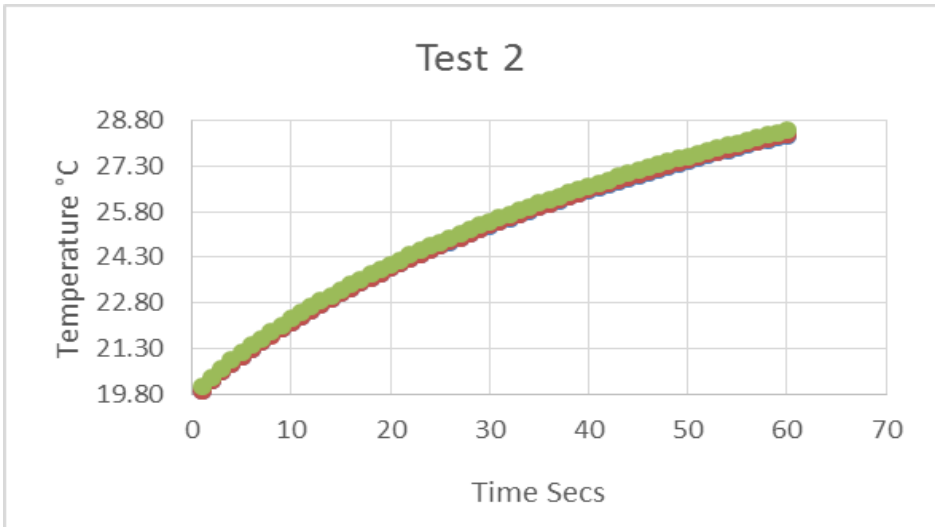


Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F43

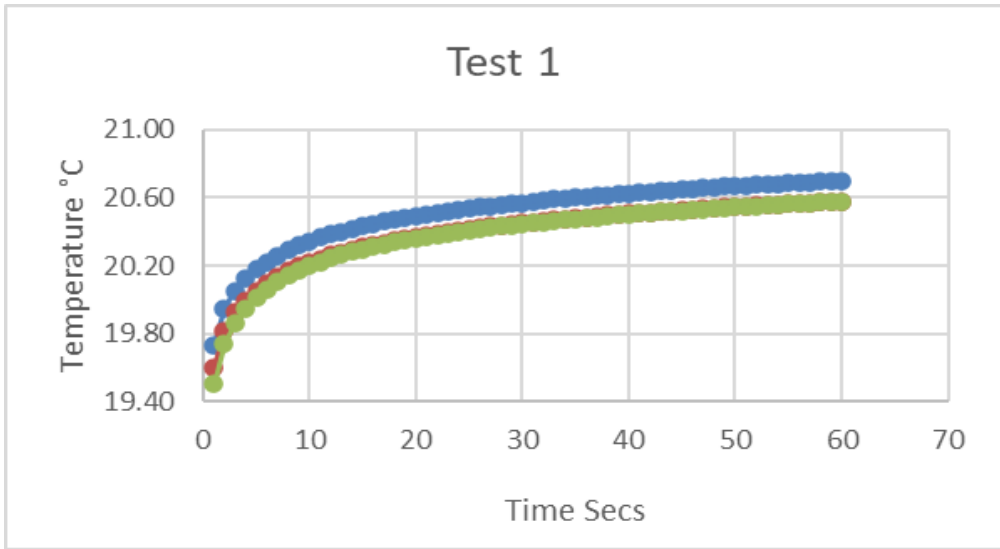
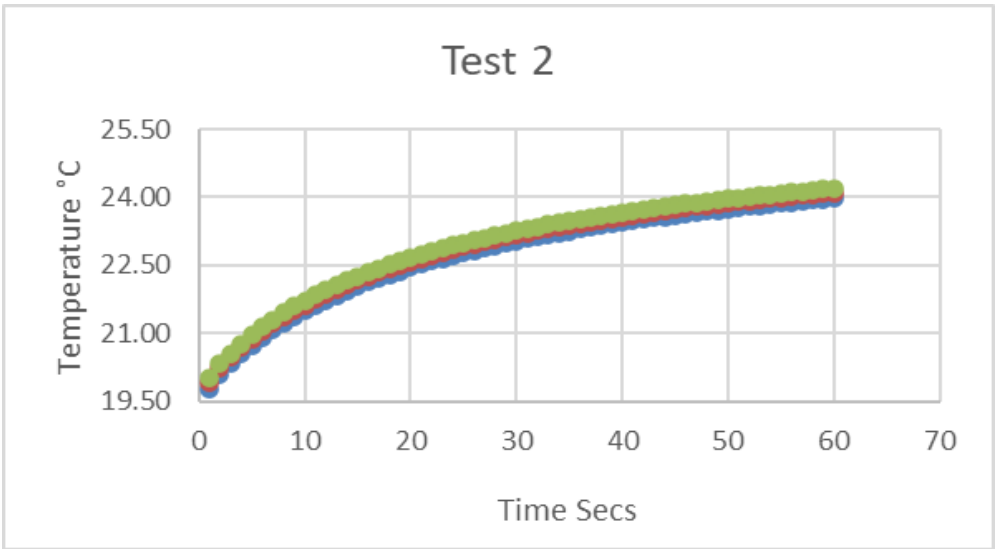
- A15075-1-2012894.xls

Lab Project No A15075-1 : 05/03/2024 16:18:15

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP26	1.00		B	2012894	Soil	Recompacted	0	291.7	126.89	152.34	2388.27	1.03	0.26	17.56	Hand Pushed	60.0	1.53	1.01	0.59	1.68	Very dark brown organic material with rootlets.	
TP26	1.00		B	2012894	Soil	Recompacted	0	5.1	111.00	152.07	2016.04	0.51	0.49	19.30	Hand Pushed	60.0	8.42	1.01	0.04	22.25	Very dark brown organic material with rootlets.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F44	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F44

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560			
				Client SSEN Transmission																				
				Engineer Jacob's																				
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description			
Hole	Depth m	Spec. Ref.	Sample Type																					
TP27	0.20		B	2013208	Soil	Recompacted	20	26.1	126.89	152.34	4299.52	1.86	1.48	18.95	Hand Pushed	60.0	1.00	1.01	1.66	0.60	Brown gravelly sandy CLAY. Gravel is fine to coarse.			
TP27	0.20		B	2013208	Soil	Recompacted	20	0.1	127.03	152.07	3748.19	1.62	1.62	19.23	Hand Pushed	60.0	4.18	1.02	0.24	4.15	Brown gravelly sandy CLAY. Gravel is fine to coarse.			
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U				
Originator	Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																		Page 1 of 2			
MAB	 05/03/2024																				Figure F45			

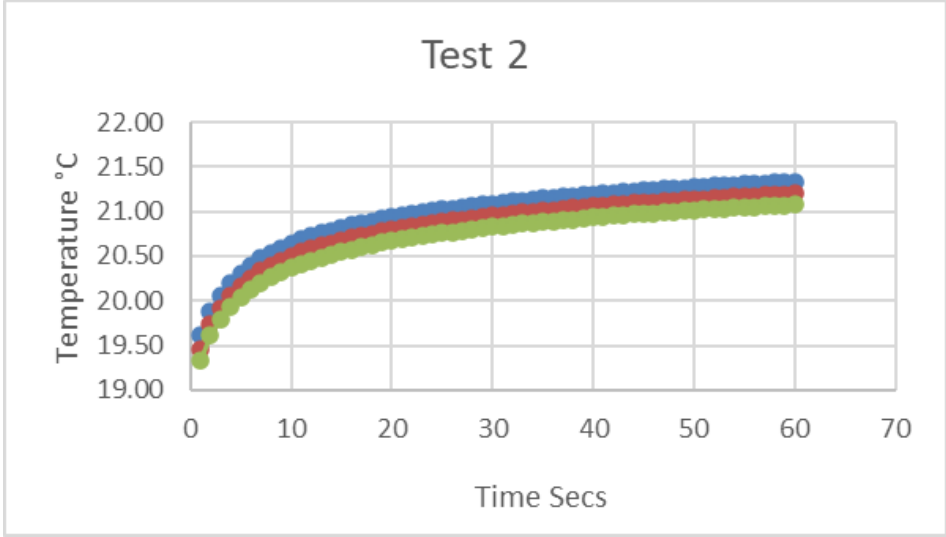
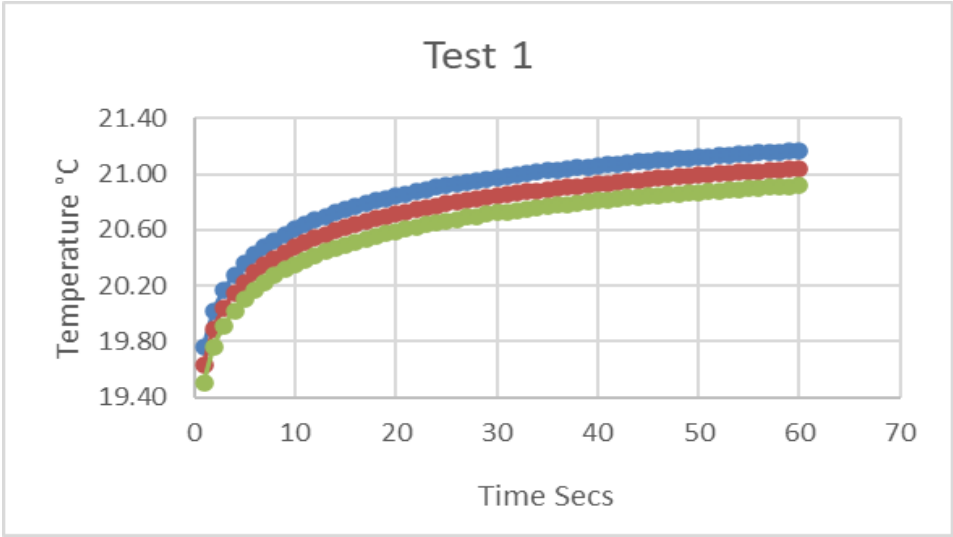
	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F45

- A15075-1-2012896.xls

Lab Project No A15075-1 : 05/03/2024 16:18:15

				Site LT521 FASNAKYLE 400KV SUBSTATION																Contract No 26560		
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP28	1.00		B	2012896	Soil	Recompacted	33	18.2	126.89	152.34	4635.82	2.00	1.69	18.96	Hand Pushed	60.0	1.41	1.01	1.16	0.85	Brown silty very sandy fine to coarse GRAVEL.	
TP28	1.00		B	2012896	Soil	Recompacted	33	5.1	127.03	152.07	4239.66	1.84	1.75	18.79	Hand Pushed	60.0	1.73	1.01	0.88	1.13	Brown silty very sandy fine to coarse GRAVEL.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F46	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	



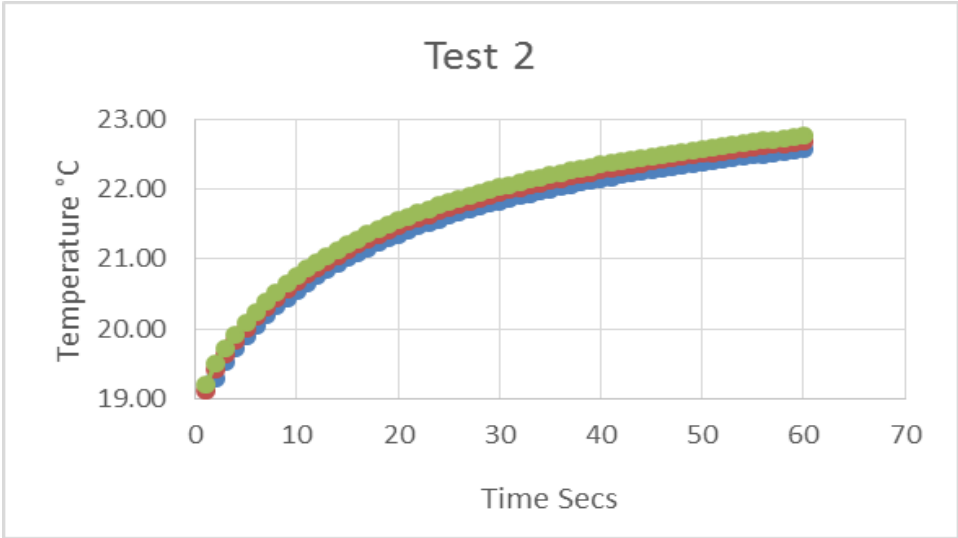
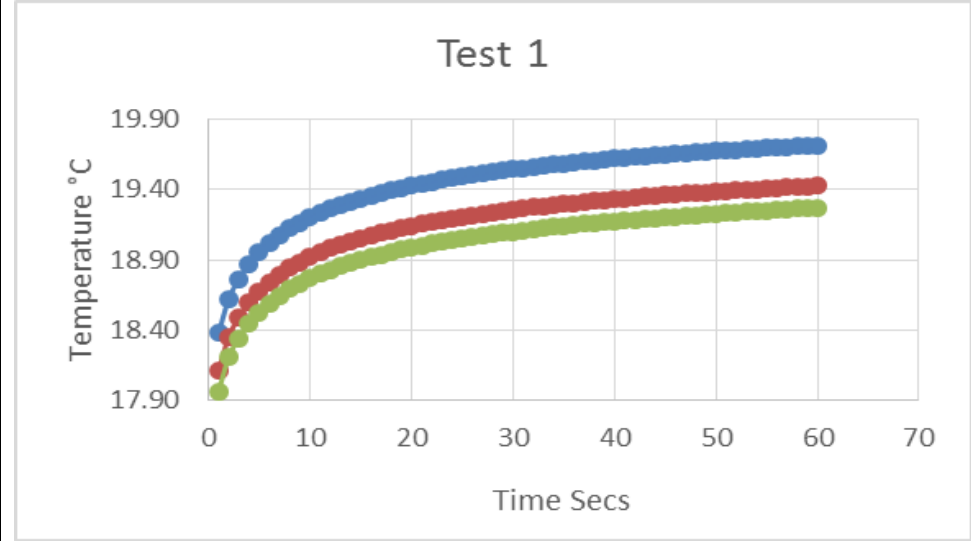
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F46

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP30	1.00		B	2012901	Soil	Recompacted	21	17.9	127.26	151.66	4873.80	2.11	1.79	17.49	Hand Pushed	60.0	1.31	1.02	1.38	0.72	Dark brown sandy gravelly CLAY. Gravel is fine to coarse.	
TP30	1.00		B	2012901	Soil	Recompacted	21	0.1	127.11	151.96	4140.65	1.80	1.80	18.42	Hand Pushed	60.0	3.57	1.02	0.31	3.17	Dark brown sandy gravelly CLAY. Gravel is fine to coarse.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F47	



Site	LT521 FASNAKYLE 400KV SUBSTATION
Client	SSEN Transmission
Engineer	Jacob's

Contract No
26560

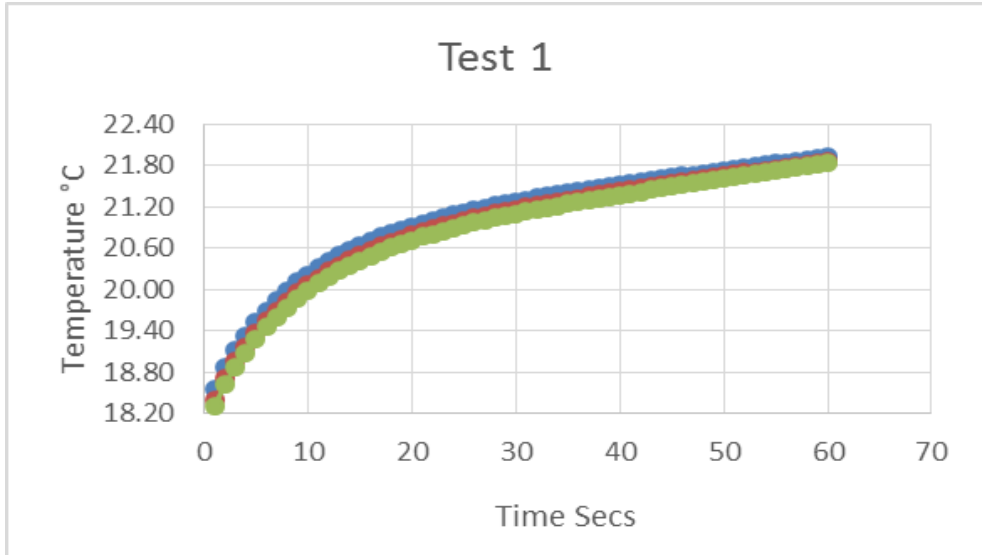
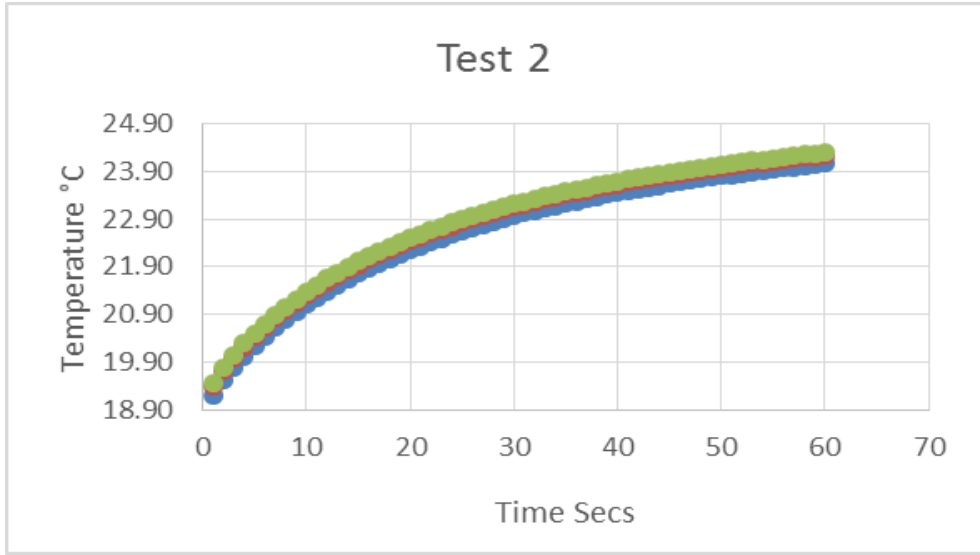


Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F47

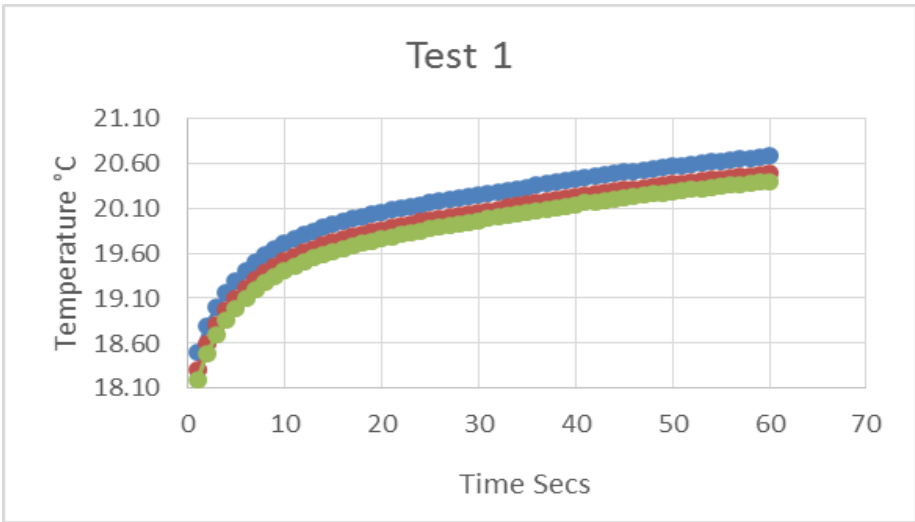
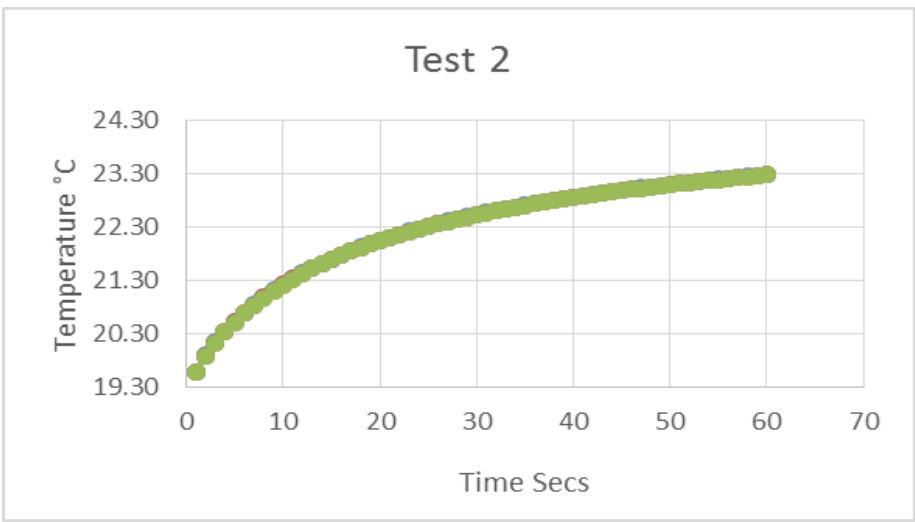
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Lab Project No A15075-1 : 05/03/2024 16:18:15

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP34	1.00		B	2012904	Soil	Recompacted	31	6.9	127.26	152.10	4815.36	2.08	1.95	17.73	Hand Pushed	60.0	3.45	1.01	0.27	3.71	Very dark grey very gravelly slightly clayey SAND. Gravel is fine to coarse.	
TP34	1.00		B	2012904	Soil	Recompacted	31	0.1	127.26	151.66	4077.44	1.77	1.77	18.67	Hand Pushed	60.0	4.84	1.02	0.21	4.67	Very dark grey very gravelly slightly clayey SAND. Gravel is fine to coarse.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F48	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F48

				Site LT521 FASNAKYLE 400KV SUBSTATION																	Contract No 26560	
				Client SSEN Transmission																		
				Engineer Jacob's																		
Sample Identification				Lab Sample ID	Material Type	Material Condition	Percentage retained on 20mm sieve %	Water Content %	Specimen Height mm	Specimen Diameter mm	Specimen Mass g	Bulk Density Mg/m3	Dry Density Mg/m3	Soil Temperature °C	Method of Insertion	Heating Time s	Temperature Change During Heating °C	Calibration Factor	Thermal Conductivity W/mK	Thermal Resistivity mK/W	Description	
Hole	Depth m	Spec. Ref.	Sample Type																			
TP37	0.50		B	2012905	Soil	Recompacted	43	7.5	126.78	152.32	4673.72	2.02	1.88	17.66	Hand Pushed	60.0	2.18	1.02	0.32	3.09	Dark brown slightly silty very sandy fine to coarse GRAVEL.	
TP37	0.50		B	2012905	Soil	Recompacted	43	1.0	127.55	152.19	4304.57	1.86	1.84	18.90	Hand Pushed	60.0	3.70	1.01	0.30	3.27	Dark brown slightly silty very sandy fine to coarse GRAVEL.	
Accreditation M=Mcerts U=UKAS N=No accreditation							U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Originator		Checked & Approved		SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022																	Page 1 of 2	
MAB		05/03/2024																			Figure F49	

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No 26560
	Client	SSEN Transmission	
	Engineer	Jacob's	
Test 1  Test 2 			
Originator	Checked & Approved	SUMMARY OF THERMAL CONDUCTIVITY / RESISTIVITY TESTS In accordance with ASTM D5334-14 Water Content reported to BS EN ISO 17892-1:2014, Bulk Density reported to BS EN ISO 17892-2:2014/ BS 1377-2: 2022	Page 2 of 2
MAB	 05/03/2024		Figure F49



Certificate of Analysis

Certificate Number 23-29964-0

Issued: 18-Mar-24

Client Terra Tek
62 Rochsolloch Road
Airdrie
ML6 9BG

Our Reference 23-29964-0

Client Reference ~ A15075-1

Order No ~ AL013848

Contract Title ~ (not supplied)

Description 8 Soil samples.

Date Received 20-Dec-23

Date Started 20-Dec-23

Date Completed 18-Mar-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 23-29964, amendments made

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Approved By

Kirk Bridgewood
General Manager



Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 3

Summary of Chemical Analysis

Soil Samples

Our Ref 23-29964-0
 Client Ref ~ A15075-1
 Contract Title ~

Lab No	2280028	2280029	2280030	2280031	2280032	2280033	2280034	2280035
Sample ID ~	TP10	TP18	TP19	TP21	TP22	TP24	TP26	TP22
Depth ~	0.50	0.50	0.50	0.00	0.50	0.00	1.00	1.00
Other ID ~	2012882	2012885	2012886	2012889	2012890	2012892	2012895	2012891
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	24/11/2023	23/11/2023	23/11/2023	23/11/2023	24/11/2023	22/11/2023	22/11/2023	24/11/2023
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
Inorganics											
pH	DETSC 2008#		pH			4.5		3.9		4.2	
Organic matter	DETSC 2002#	0.1	%	19	17		23		24		19
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l			45		77		47	
Sulphur as S, Total	DETSC 2320	0.01	%			0.06		0.35		0.59	
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.12		0.26		0.27	

Information in Support of the Analytical Results

Our Ref 23-29964-0

Client Ref ~ A15075-1

Contract ~

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2280028	TP10 0.50 SOIL	24/11/23	PT 500ml		
2280029	TP18 0.50 SOIL	23/11/23	PT 500ml		
2280030	TP19 0.50 SOIL	23/11/23	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2280031	TP21 0.00 SOIL	23/11/23	PT 500ml		
2280032	TP22 0.50 SOIL	24/11/23	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2280033	TP24 0.00 SOIL	22/11/23	PT 500ml		
2280034	TP26 1.00 SOIL	22/11/23	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2280035	TP22 1.00 SOIL	24/11/23	PT 500ml		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-00916-0-1

Issued: 18-Mar-24

Client Terra Tek
62 Rochsolloch Road
Airdrie
ML6 9BG

Our Reference 24-00916-0-1

Client Reference ~ A15075-2

Order No ~ (not supplied)

Contract Title ~ (not supplied)

Description 20 Soil samples.

Date Received 17-Jan-24

Date Started 17-Jan-24

Date Completed 18-Mar-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 24-00916, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 5

Summary of Chemical Analysis

Soil Samples

Our Ref 24-00916-0-1
 Client Ref ~ A15075-2
 Contract Title ~

Lab No	2287345	2287346	2287347	2287348	2287349	2287350	2287351	2287352	2287353	2287354	2287355
Sample ID ~	TP13	TP15	TP16	TP16	TP17	TP17	TP19	TP21	TP22	TP23	TP24
Depth ~	0.30	0.50	0.50	0.80	1.00	2.00	0.70	0.70	2.00	0.70	0.50
Other ID ~	2013196	2013200	2013203	2013205	2013206	2013207	2013210	2013211	2013212	2013213	2013214
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	29/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023	27/11/2023	23/11/2023	23/11/2023	24/11/2023	22/11/2023	22/11/2023
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Inorganics														
pH	DETSC 2008#		pH			6.3	7.0		5.5	5.6	5.5	5.5	6.5	5.4
Organic matter	DETSC 2002#	0.1	%	17	18			13						
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l			24	26		27	< 10	12	27	11	< 10
Sulphur as S, Total	DETSC 2320	0.01	%			0.02	0.03		0.30	0.03	0.01	0.05	< 0.01	0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.03	0.03		0.51	0.04	0.02	0.04	0.02	0.02

Summary of Chemical Analysis

Soil Samples

Our Ref 24-00916-0-1
 Client Ref ~ A15075-2
 Contract Title ~

Lab No	2287356	2287357	2287358	2287359	2287360	2287361	2287362	2287363	2287364
Sample ID ~	BH17	TP01	TP02	TP03	TP07	TP08	TP09	TP11	TP12
Depth ~	0.50	0.50	0.00	0.00	0.00	0.00	0.20	1.00	0.00
Other ID ~	2013177	2013181	2013183	2013184	2013186	2013188	2013191	2013192	2013193
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	30/11/2023	29/11/2023	29/11/2023	04/12/2023	29/11/2023	04/12/2023	28/11/2023	04/12/2023	29/11/2023
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units									
Inorganics												
pH	DETSC 2008#		pH			4.3		4.5	4.6	4.5		4.3
Organic matter	DETSC 2002#	0.1	%	13	14		21				22	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l			47		22	37	13		15
Sulphur as S, Total	DETSC 2320	0.01	%									
Sulphate as SO4, Total	DETSC 2321#	0.01	%									

Information in Support of the Analytical Results

Our Ref 24-00916-0-1

Client Ref ~ A15075-2

Contract ~

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2287345	TP13 0.30 SOIL	29/11/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287346	TP15 0.50 SOIL	27/11/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287347	TP16 0.50 SOIL	27/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287348	TP16 0.80 SOIL	27/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287349	TP17 1.00 SOIL	27/11/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287350	TP17 2.00 SOIL	27/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287351	TP19 0.70 SOIL	23/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287352	TP21 0.70 SOIL	23/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287353	TP22 2.00 SOIL	24/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287354	TP23 0.70 SOIL	22/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287355	TP24 0.50 SOIL	22/11/23	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287356	BH17 0.50 SOIL	30/11/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287357	TP01 0.50 SOIL	29/11/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287358	TP02 0.00 SOIL	29/11/23	PT 500ml	Anions 2:1 (30 days), pH + Conductivity (7 days)	
2287359	TP03 0.00 SOIL	04/12/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287360	TP07 0.00 SOIL	29/11/23	PT 500ml	Anions 2:1 (30 days), pH + Conductivity (7 days)	
2287361	TP08 0.00 SOIL	04/12/23	PT 500ml	Anions 2:1 (30 days), pH + Conductivity (7 days)	
2287362	TP09 0.20 SOIL	28/11/23	PT 500ml	Anions 2:1 (30 days), pH + Conductivity (7 days)	
2287363	TP11 1.00 SOIL	04/12/23	PT 500ml	Organic Matter (Manual) (28 days)	
2287364	TP12 0.00 SOIL	29/11/23	PT 500ml	Anions 2:1 (30 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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Information in Support of the Analytical Results

Our Ref 24-00916-0-1
Client Ref ~ A15075-2
Contract ~

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results
* -not accredited.
-MCERTS (accreditation only applies if report carries the MCERTS logo).
\$ -subcontracted.
n/s -not supplied.
I/S -insufficient sample.
U/S -unsuitable sample.
t/f -to follow.
nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-00918-0

Issued: 04-Mar-24

Client Terra Tek
62 Rochsolloch Road
Airdrie
ML6 9BG

Our Reference 24-00918-0

Client Reference A15075-3

Order No (not supplied)

Contract Title (not supplied)

Description 4 Soil samples.

Date Received 17-Jan-24

Date Started 17-Jan-24

Date Completed 04-Mar-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 24-00918, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 24-00918-0

Client Ref A15075-3

Contract Title

Lab No	2287371	2287372	2287373	2287374
Sample ID	BH14	BH28	BH28	TP36A
Depth	0.80	0.50	2.65	0.50
Other ID	201352	2013353	2013354	2013356
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	14/12/2023	14/12/2023	14/12/2023	13/12/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Inorganics							
pH	DETSC 2008#		pH	5.9			
Organic matter	DETSC 2002#	0.1	%		21	23	4.6
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	36			
Sulphur as S, Total	DETSC 2320	0.01	%	0.03			
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.05			

Information in Support of the Analytical Results

Our Ref 24-00918-0

Client Ref A15075-3

Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2287371	BH14 0.80 SOIL	14/12/23		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2287372	BH28 0.50 SOIL	14/12/23		PG	Organic Matter (Manual) (28 days)	
2287373	BH28 2.65 SOIL	14/12/23		PG	Organic Matter (Manual) (28 days)	
2287374	TP36A 0.50 SOIL	13/12/23		PT 500ml	Organic Matter (Manual) (28 days)	

Key: P-Plastic T-Tub G-Bag

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 24-01789-0

Issued: 04-Mar-24

Client Terra Tek
62 Rochsolloch Road
Airdrie
ML6 9BG

Our Reference 24-01789-0

Client Reference A15075-4

Order No (not supplied)

Contract Title A15075-4

Description 3 Soil samples.

Date Received 26-Jan-24

Date Started 29-Jan-24

Date Completed 04-Mar-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 24-01789, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 24-01789-0

Client Ref A15075-4

Contract Title A15075-4

Lab No	2292216	2292217	2292218
Sample ID	BH02	BH12	BH16
Depth	0.10	0.50	0.40
Other ID	2013667	2013669	2013670
Sample Type	SOIL	SOIL	SOIL
Sampling Date	09/01/2024	19/12/2023	18/12/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	57		
Organic matter	DETSC 2002#	0.1	%	> 25	2.4	2.1

Information in Support of the Analytical Results

Our Ref 24-01789-0

Client Ref A15075-4

Contract A15075-4

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2292216	BH02 0.10 SOIL	09/01/24	PG			
2292217	BH12 0.50 SOIL	19/12/23	PG		Organic Matter (Manual) (28 days)	
2292218	BH16 0.40 SOIL	18/12/23	PG		Organic Matter (Manual) (28 days)	

Key: P-Plastic G-Bag

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Site: LT521 FASNAKYLE 400KV SUBSTATION

Contract No: 26560

Client: SSEN Transmission

Engineer: Jacobs

TEST

CLASSIFICATION TESTS

Determination of water content
Determination of liquid limit
Determination of liquid and plastic limits
Determination of bulk density
Determination of particle density
Determination of particle size distribution

CHEMICAL TESTS

Determination of organic matter content
Determination of mass loss on ignition
Determination of sulphate content of soil and groundwater
Determination of chloride content
Determination of pH value

COMPACTION-RELATED TESTS

Determination of dry density/moisture content relationship
Determination of moisture condition value (MCV)
Determination of California Bearing Ratio (CBR)

CONSOLIDATION AND STRENGTH TESTS

Incremental loading oedometer test
Unconfined compression test
Unconsolidated undrained triaxial test
Consolidated triaxial compression tests on water saturated soils
Lab Vane Tests
Direct shear tests
Permeability tests
Fall cone test

ROCK TESTS

Determination of point load strength
Determination of unconfined compressive strength
LA Abrasion Tests
Magnesium Soundness Tests
Slake durability
Rock porosity / density

STANDARD

BS EN ISO 17892-1:2014
BS 1377 : 1990 : Part 2 : 4.3 and 4.4
BS EN ISO 17892-12:2018
BS EN ISO 17892-2:2014
BS EN ISO 17892-3:2016
BS EN ISO 17892-4:2016

BS 1377 : 1990 : Part 3 : 3.4
BS 1377 : 1990 : Part 3 : 4.3
BS 1377 : 1990 : Part 3 : 5.2, 5.3 and 5.5
BS 1377 : 1990 : Part 3 : 7.2 and 7.3
BS 1377 : 1990 : Part 3 : 9.5

BS 1377 : 1990 : Part 4 : 3.3 to 3.6
SDD Tech Memo SH7/83; SDD Appls Guide No.1 Rev. 1989
BS 1377 : 1990 : Part 4 : 7.4

BS EN ISO 17892-5:2017
BS EN ISO 17892-7:2018
BS EN ISO 17892-8:2018
BS EN ISO 17892-9:2018
BS 1377 : 1990
BS EN ISO 17892-10:2019
BS EN ISO 17892-11:2019
BS EN ISO 17892-6:2017

ISRM Commission on Testing Methods, 1985
ASTM D7012-14
BS EN 1097-2:2010 and BS 818 : Part 2 : 1990
BS EN 1367-2
ISRM Suggested methods
ISRM Suggested methods



[illegible]

				Site LT521 FASNAKYLE 400KV SUBSTATION				Contract No 26560		
				Client SSEN Transmission						
				Engineer Jacobs						
Sample Identification					Lab Sample ID	10-14mm Size Fraction Passing 11.2mm Sieve	Particle Density (8-12.5 mm) Mg/m³	Los Angeles Coefficient LA	Impact Value SZ	Test Date
Hole ID	Depth m	Sample Ref	Sample Type							
BH13	4.00-4.55		C	2013658	35	~	21	~	~	
BH16	1.40-4.40		C	2013703	35	~	21	~	~	
BH22	7.50-10.00		C	2013218	35	~	37	~	~	
BH27	5.50-7.10		C	2013653	35	~	22	~	~	
UKAS accredited test							Yes	No		
Notes Opinions and interpretations are outside the scope of UKAS accreditation.										
Originator		Approved		RESISTANCE TO FRAGMENTATION BY LOS ANGELES AND IMPACT TEST METHODS BS EN 1097-2:2020					 Figure F1 Sheet 1 of 1	
DW		CD 05/03/2024								

				Site LT521 FASNAKYLE 400KV SUBSTATION					Contract No 26560	
				Client SSEN Transmission						
				Engineer Jacobs						
Sample Identification				Lab Sample ID	Size Fraction of the Aggregate	Mass of Material Tested	Apparent Particle Density (Pa)	Particle Density-Oven-dried Basis (Prd)	Particle Density-Saturated and Surface-dried Basis (Pssd)	Water Absorption (WA ₂₄)
Hole ID	Depth m	Sample Ref	Test Date							
BH21	4.40-4.90		C	2013215	31.5mm-4mm	4182	2.75	2.69	2.71	0.8
UKAS accredited test							Yes			
Notes Opinions and interpretations are outside the scope of UKAS accreditation.										
Originator		Approved		DETERMINATION OF PARTICLE DENSITY AND WATER ABSORPTION BS EN 1097-6:2022 Clause 8					 Figure F2 Sheet 1 of 1	
DW		CD 05/03/2024								

				SiteLT521 FASNAKYLE 400KV SUBSTATION				Contract No26560		
				ClientSSEN Transmission						
				EngineerJacobs						
Sample Identification										
Hole ID	Depth m	Sample Ref	Sample Type							
BH15	2.80-4.40		C	2013644	Tap Water / 20oC	Virtually Unchanged	Fines	98.6	~	
BH17	4.30-6.10		C	2013646	Tap Water / 20oC	Virtually Unchanged	Fines	98.2	~	
BH25	7.60-9.10		C	2013220	Tap Water / 20oC	Large and Small Fragments	Fines	82.8	~	
BH27	7.90-9.90		C	2013655	Tap Water / 20oC	Large and Small Fragments	Fines	97.5	~	
UKAS accredited test								Yes		
NotesOpinions and interpretations are outside the scope of UKAS accreditation.										
Originator		Approved		SLAKE-DURABILITY INDEX (SECOND CYCLE) ISRM Suggested Methods						 Figure F3
DW		CD 05/03/2024								
										Sheet 1 of 1

				Site LT521 FASNAKYLE 400KV SUBSTATION				Contract No 26560		
				Client SSEN Transmission						
				Engineer Jacobs						
Sample Identification				Lab Sample ID	Non Engineering Sample Description	Aggregate Size Fractions	Soundness Value (S) No.1	Soundness Value (S) No.2	Magnesium Sulphate Soundness Value (MS)	
Location / Origin	Depth m	Sample Ref	Sample Type							
BH18	2.90-4.40		C	2013648	Grey crushed gravel	14mm-10mm	9.2	7.3	8	
BH22	4.00-5.70		C	2013217	Grey Crushed Gravel	14mm-10mm	10.6	12.1	11	
BH24	5.00-6.90		C	2013219	Grey Crushed Gravel	14mm-10mm	12.5	10.7	12	
BH26	3.50-5.50		C	2013224	Grey Crushed Gravel	14mm-10mm	11.8	12.3	12	
Subcontracted Test						No		UKAS accredited test		Yes
Notes						Opinions and interpretations are outside the scope of UKAS accreditation.				
Originator		Approved		DETERMINATION OF MAGNESIUM SULFATE SOUNDNESS BS EN 1367-2 : 2009					 Figure F4	
DW		CD 05/03/2024								
										Sheet 1 of 1

				Site LT521 FASNAKYLE 400KV SUBSTATION				Contract No 26560	
				Client SSEN Transmission					
				Engineer Jacobs					
Sample Identification				Lab Sample ID	Non Engineering Sample Description	Date Sample Received	Mass of Test Portion	Flakiness Index	Comments
Location / Origin	Depth m	Sample Ref	Sample Type						
BH19	2.25-2.90		C	2013663	Grey Crushed Coarse to Fine Gravel	45310	11608g	22FI	~
Subcontracted Test No						UKAS accredited test Yes			
Notes Opinions and interpretations are outside the scope of UKAS accreditation.									
Originator		Approved		DETERMINATION OF PARTICLE SHAPE - FLAKINESS INDEX BS EN 933-3 : 2012				 Figure F5	
DW		CD 05/03/2024							
Sheet 1 of 1									

				Site LT521 FASNAKYLE 400KV SUBSTATION				Contract No 26560	
				Client SSEN Transmission					
				Engineer Jacobs					
Sample Identification				Lab Sample ID	Non Engineering Sample Description	Sample Certificate Available Yes / No	Test Condition Of Specimen Dry / Soaked	Aggregate Crushing Value	Comments
Location / Origin	Depth m	Sample Ref	Sample Type						
BH11	3.70-6.10		C	2013702	Grey crushed gravel	No	Dry	18	~
BH20	2.90-3.50		C	2013650	Grey crushed gravel	No	Dry	15	~
BH25	9.50-13.10		C	2013221	Greys crushed GRAVEL	No	Dry	16	
BH28	6.95-9.95		C	2013706	Grey crushed gravel	No	Dry	16	~
Subcontracted Test						UKAS accredited test			
Notes						Opinions and interpretations are outside the scope of UKAS accreditation.			
Originator		Approved		DETERMINATION OF AGGREGATE CRUSHING VALUE (ACV) BS 812 : Part 110 : 1990				 Figure F6	
DW		CD 05/03/2024							
								Sheet 1 of 1	

		SiteLT521 FASNAKYLE 400KV SUBSTATION						Contract No26560 ~ Indicates test not carried out
		ClientSSEN Transmission						
		EngineerJacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m²	MN/m²	
BH02	2.65	Axial	79.0	34.0	4.3	1.26	1.35	
BH02	2.65	Diametral	254.0	79.0	4.4	0.71	0.87	
BH02	2.90	Axial	80.0	95.0	19.8	2.05	2.77	
BH02	4.40	Axial	80.0	56.0	5.8	1.02	1.22	
BH02	4.40	Diametral	237.0	80.0	30.2	4.72	5.83	
BH03	2.30	Lump	64.0	44.0	30.2	8.42	9.13	
BH03	2.60	Axial	80.0	42.0	45.0	10.52	11.87	
BH03	3.65	Axial	80.0	38.0	40.9	10.57	11.66	
BH03	3.65	Diametral	298.0	80.0	45.0	7.03	8.69	
BH04	2.00	Axial	103.0	59.0	40.5	5.23	6.75	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
DW	 05/03/2024							
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		Site LT521 FASNAKYLE 400KV SUBSTATION						Contract No 26560 ~ Indicates test not carried out
		Client SSEN Transmission						
		Engineer Jacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH04	2.00	Diametral	148.0	103.0	45.0	4.24	5.87	
BH04	4.65	Axial	102.0	69.0	28.0	3.12	4.16	
BH04	4.65	Diametral	179.0	102.0	12.7	1.22	1.68	
BH04	4.70	Lump	67.0	51.0	8.9	2.05	2.32	
BH04	5.70	Axial	102.0	88.0	25.7	2.25	3.17	
BH04	5.70	Diametral	299.0	103.0	39.8	3.75	5.19	
BH08	2.15	Axial	103.0	65.0	45.0	5.28	6.96	
BH08	2.15	Diametral	287.0	103.0	42.3	3.99	5.52	
BH08	3.50	Axial	103.0	59.0	35.4	4.58	5.90	
BH08	3.50	Diametral	226.0	103.0	30.2	2.85	3.94	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
DW	 05/03/2024							
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		SiteLT521 FASNAKYLE 400KV SUBSTATION						Contract No26560 ~ Indicates test not carried out
		ClientSSEN Transmission						
		EngineerJacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m²	MN/m²	
BH09	3.40	Axial	103.0	61.0	29.6	3.70	4.81	
BH09	3.40	Diametral	135.0	103.0	32.5	3.06	4.24	
BH09	3.50	Lump	58.0	42.0	12.9	4.16	4.37	
BH09	5.10	Axial	103.0	59.0	28.7	3.71	4.78	
BH09	5.10	Diametral	209.0	103.0	25.4	2.39	3.31	
BH09	5.40	Lump	65.0	32.0	18.7	7.06	7.15	
BH09	6.50	Axial	103.0	60.0	32.0	4.07	5.26	
BH09	6.50	Diametral	165.0	103.0	35.1	3.31	4.58	
BH11	1.50	Axial	80.0	34.0	12.4	3.58	3.85	
BH11	1.50	Diametral	197.0	80.0	4.3	0.67	0.83	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH11	3.60	Lump	98.0	39.0	26.7	5.49	6.37	
BH11	3.90	Axial	80.0	45.0	40.7	8.88	10.18	
BH11	3.90	Diametral	149.0	80.0	37.6	5.88	7.26	
BH11	5.50	Axial	80.0	30.0	42.5	13.91	14.55	
BH12	3.95	Axial	80.0	45.0	35.8	7.81	8.95	
BH12	3.95	Diametral	1.0	80.0	40.2	6.28	7.76	
BH12	4.30	Axial	80.0	97.0	29.8	3.02	4.11	
BH12	5.85	Axial	79.0	48.0	30.6	6.34	7.35	
BH12	5.85	Diametral	265.0	80.0	35.4	5.53	6.83	
BH13	2.00	Lump	56.0	32.0	20.5	8.98	8.80	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
DW	CD 05/03/2024		



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No **26560**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH13	2.33	Axial	103.0	59.0	32.8	4.24	5.47	
BH13	2.75	Axial	103.0	62.0	39.8	4.89	6.38	
BH13	2.75	Diametral	198.0	103.0	40.7	3.84	5.31	
BH13	3.70	Axial	103.0	84.0	38.5	3.49	4.88	
BH13	3.70	Diametral	234.0	103.0	35.8	3.37	4.67	
BH13	5.15	Lump	115.0	39.0	18.7	3.27	3.94	
BH13	5.70	Axial	103.0	58.0	43.2	5.68	7.30	
BH13	6.20	Axial	103.0	50.0	41.5	6.33	7.86	
BH13	6.20	Diametral	165.0	103.0	45.0	4.24	5.87	
BH13	7.50	Axial	103.0	62.0	43.1	5.30	6.91	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH13	7.58	Diametral	254.0	103.0	45.0	4.24	5.87	
BH13	7.65	Axial	103.0	44.0	45.0	7.80	9.41	
BH14	1.54	Axial	79.0	69.0	42.6	6.14	7.72	
BH14	1.54	Diametral	156.0	79.0	40.2	6.44	7.91	
BH14	2.77	Lump	65.0	49.0	19.5	4.81	5.36	
BH14	3.17	Axial	79.0	59.0	43.2	7.28	8.84	
BH14	4.40	Axial	79.0	50.0	45.0	8.95	10.47	
BH14	4.40	Diametral	198.0	79.0	45.0	7.21	8.86	
BH14	4.70	Lump	87.0	65.0	23.4	3.25	4.12	
BH14	5.55	Axial	79.0	65.0	40.2	6.15	7.63	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7 Sheet 6 of 18
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

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~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH14	6.52	Axial	79.0	54.0	43.2	7.95	9.47	
BH14	6.52	Diametral	123.0	79.0	38.4	6.15	7.56	
BH15	1.30	Axial	103.0	36.0	42.1	8.92	10.29	
BH15	1.65	Lump	87.0	40.0	19.2	4.33	4.93	
BH15	2.50	Axial	103.0	59.0	40.7	5.26	6.78	
BH15	2.50	Diametral	159.0	103.0	32.4	3.05	4.23	
BH15	3.40	Axial	102.0	30.0	45.0	11.55	12.76	
BH15	3.40	Diametral	235.0	102.0	45.0	4.33	5.96	
BH15	5.10	Lump	109.0	42.0	26.4	4.53	5.48	
BH15	5.45	Axial	103.0	50.0	30.1	4.59	5.70	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
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		SiteLT521 FASNAKYLE 400KV SUBSTATION						Contract No26560 ~ Indicates test not carried out
		ClientSSEN Transmission						
		EngineerJacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m²	MN/m²	
BH15	6.70	Axial	102.0	87.0	32.1	2.84	3.99	
BH15	6.70	Diametral	168.0	102.0	38.9	3.74	5.15	
BH16	5.25	Lump	112.0	35.0	18.9	3.79	4.42	
BH16	5.65	Axial	103.0	49.0	30.9	4.81	5.95	
BH16	5.75	Axial	102.0	80.0	35.8	3.45	4.75	
BH16	5.75	Diametral	214.0	103.0	28.7	2.71	3.74	
BH16	7.10	Axial	103.0	50.0	30.7	4.68	5.82	
BH16	7.10	Diametral	265.0	103.0	37.8	3.56	4.93	
BH16	7.25	Axial	103.0	56.0	40.7	5.54	7.06	
BH16	7.25	Diametral	168.0	103.0	31.4	2.96	4.10	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH17	3.50	Axial	103.0	64.0	45.0	5.36	7.04	
BH17	3.50	Diametral	312.0	103.0	40.2	3.79	5.25	
BH17	4.30	Axial	101.0	55.0	37.4	5.29	6.68	
BH17	4.60	Lump	141.0	33.0	15.4	2.60	3.16	
BH17	6.50	Axial	103.0	69.0	45.0	4.97	6.64	
BH17	6.80	Diametral	241.0	103.0	45.0	4.24	5.87	
BH17	8.00	Axial	103.0	58.0	45.0	5.92	7.60	
BH17	8.00	Diametral	177.0	103.0	39.8	3.75	5.19	
BH18	4.00	Axial	103.0	87.0	39.4	3.45	4.86	
BH18	4.00	Diametral	171.0	103.0	27.2	2.56	3.55	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
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		Site LT521 FASNAKYLE 400KV SUBSTATION						Contract No 26560 ~ Indicates test not carried out
		Client SSEN Transmission						
		Engineer Jacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m²	MN/m²	
BH18	5.10	Axial	103.0	56.0	35.4	4.82	6.14	
BH18	5.10	Diametral	193.0	103.0	4.5	0.42	0.59	
BH18	6.80	Axial	103.0	45.0	42.8	7.25	8.80	
BH18	6.80	Diametral	261.0	103.0	35.1	3.31	4.58	
BH19	3.33	Axial	103.0	64.0	42.9	5.11	6.71	
BH19	3.33	Diametral	153.0	103.0	40.1	3.78	5.23	
BH19	3.62	Lump	98.0	63.0	25.4	3.23	4.18	
BH19	4.03	Axial	103.0	58.0	36.5	4.80	6.16	
BH19	4.85	Lump	52.0	32.0	16.4	7.74	7.46	
BH19	5.15	Axial	103.0	52.0	38.7	5.67	7.11	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
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		SiteLT521 FASNAKYLE 400KV SUBSTATION						Contract No26560 ~ Indicates test not carried out
		ClientSSEN Transmission						
		EngineerJacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
BH19	5.75	Axial	103.0	67.0	45.0	5.12	6.80	
BH19	5.75	Diametral	200.0	103.0	45.0	4.24	5.87	
BH20	1.10	Axial	103.0	45.0	19.8	3.36	4.07	
BH20	1.10	Diametral	205.0	103.0	13.2	1.24	1.72	
BH20	1.50	Lump	94.0	42.0	16.7	3.32	3.89	
BH20	2.30	Axial	102.0	86.0	42.5	3.81	5.33	
BH20	2.80	Axial	102.0	49.0	45.0	7.07	8.73	
BH20	2.80	Diametral	182.0	102.0	37.7	3.62	4.99	
BH20	5.10	Lump	84.0	55.0	23.1	3.93	4.76	
BH20	5.10	Lump	198.0	46.0	23.4	2.02	2.85	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
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		Site LT521 FASNAKYLE 400KV SUBSTATION						Contract No 26560 ~ Indicates test not carried out
		Client SSEN Transmission						
		Engineer Jacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
BH21	4.10	Axial	102.0	59.0	19.3	2.52	3.24	
BH21	4.15	Diametral	116.0	102.0	21.6	2.08	2.86	
BH21	5.30	Lump	103.0	95.0	10.6	0.85	1.22	
BH21	5.40	Diametral	131.0	103.0	11.9	1.12	1.55	
BH21	6.20	Lump	184.0	89.0	6.9	0.33	0.53	
BH21	7.00	Lump	109.0	54.0	7.8	1.04	1.33	
BH21	7.20	Axial	102.0	58.0	12.8	1.70	2.18	
BH21	7.30	Diametral	254.0	103.0	9.7	0.91	1.27	
BH21	7.40	Axial	103.0	78.0	11.5	1.12	1.54	
BH22	5.30	Diametral	241.0	103.0	1.4	0.13	0.18	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7 Sheet 12 of 18
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH22	5.40	Axial	103.0	96.0	1.6	0.13	0.18	
BH22	5.90	Axial	103.0	82.0	0.3	0.03	0.04	
BH22	6.00	Diametral	178.0	102.0	1.7	0.16	0.23	
BH22	7.75	Diametral	240.0	102.0	4.7	0.45	0.62	
BH22	7.85	Axial	102.0	67.0	1.4	0.16	0.22	
BH22	9.20	Axial	102.0	54.0	3.0	0.43	0.54	
BH22	9.30	Diametral	271.0	102.0	7.2	0.69	0.95	
BH22	10.20	Axial	102.0	59.0	4.5	0.59	0.76	
BH22	10.30	Diametral	186.0	103.0	1.1	0.10	0.14	
BH22	11.10	Axial	103.0	43.0	3.2	0.57	0.68	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH22	11.20	Diametral	148.0	102.0	1.8	0.17	0.24	
BH23	2.16	Lump	124.0	42.0	5.9	0.89	1.11	
BH23	2.35	Axial	101.0	78.0	18.0	1.79	2.45	
BH23	3.55	Lump	175.0	60.0	13.7	1.02	1.49	
BH23	3.55	Lump	192.0	52.0	1.8	0.14	0.20	
BH23	5.00	Axial	103.0	47.0	8.7	1.41	1.73	
BH23	5.00	Diametral	202.0	103.0	16.1	1.52	2.10	
BH24	3.75	Lump	104.0	45.0	2.1	0.35	0.43	
BH24	3.80	Lump	135.0	45.0	4.8	0.62	0.80	
BH24	5.05	Axial	103.0	61.0	32.2	4.03	5.23	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
DW	CD 05/03/2024		

		Site LT521 FASNAKYLE 400KV SUBSTATION						Contract No 26560 ~ Indicates test not carried out
		Client SSEN Transmission						
		Engineer Jacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH24	5.10	Diametral	70.0	102.0	4.6	0.44	0.61	
BH24	6.10	Axial	103.0	63.0	2.0	0.24	0.32	
BH24	6.20	Axial	103.0	70.0	0.9	0.10	0.13	
BH24	6.40	Diametral	102.0	103.0	1.0	0.09	0.13	
BH24	7.85	Axial	103.0	98.0	2.3	0.18	0.26	
BH24	7.95	Diametral	213.0	103.0	1.6	0.15	0.21	
BH25	7.60	Axial	102.0	70.0	1.8	0.20	0.26	
BH25	7.65	Diametral	141.0	102.0	2.6	0.25	0.34	
BH25	9.20	Axial	103.0	45.0	2.4	0.41	0.49	
BH25	10.80	Axial	104.0	66.0	1.6	0.18	0.24	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7
DW	 05/03/2024							
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Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH25	11.70	Lump	97.0	65.0	1.9	0.24	0.31	
BH25	11.70	Lump	105.0	49.0	1.3	0.20	0.25	
BH25	12.80	Diametral	181.0	102.0	1.2	0.12	0.16	
BH25	13.00	Axial	104.0	72.0	0.4	0.04	0.06	
BH25	12.00	Axial	104.0	77.0	0.6	0.06	0.08	
BH26	4.20	Axial	103.0	70.0	8.3	0.90	1.21	
BH26	4.30	Diametral	90.0	103.0	0.4	0.04	0.05	
BH26	6.00	Lump	59.0	50.0	4.7	1.25	1.37	
BH26	6.60	Axial	10.0	74.0	8.0	8.49	6.82	
BH26	7.20	Axial	103.0	25.0	3.3	1.01	1.07	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
DW	CD 05/03/2024		



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH26	7.25	Diametral	204.0	103.0	1.3	0.12	0.17	
BH26	7.90	Lump	79.0	45.0	3.4	0.75	0.86	
BH26	7.90	Axial	101.0	60.0	3.8	0.49	0.63	
BH27	2.80	Axial	103.0	47.0	41.2	6.68	8.19	
BH27	2.80	Diametral	167.0	103.0	35.4	3.34	4.62	
BH27	4.10	Axial	103.0	95.0	12.1	0.97	1.39	
BH27	4.10	Diametral	302.0	103.0	6.0	0.57	0.78	
BH27	4.45	Axial	103.0	65.0	45.0	5.28	6.96	
BH27	4.45	Diametral	187.0	103.0	32.1	3.03	4.19	
BH27	6.60	Lump	95.0	38.0	4.3	0.94	1.07	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : as-received

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	Figure F7
DW	CD 05/03/2024		

		Site LT521 FASNAKYLE 400KV SUBSTATION						Contract No 26560 ~ Indicates test not carried out
		Client SSEN Transmission						
		Engineer Jacobs						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
BH27	7.68	Axial	103.0	54.0	28.7	4.05	5.12	
BH27	7.80	Lump	69.0	30.0	12.9	4.89	4.95	
BH27	9.40	Axial	103.0	69.0	45.0	4.97	6.64	
BH27	9.40	Diametral	193.0	103.0	29.4	2.77	3.84	
BH28	5.30	Lump	69.0	50.0	6.8	1.55	1.76	
BH28	5.65	Axial	103.0	42.0	8.4	1.53	1.82	
BH28	6.40	Lump	54.0	36.0	6.0	2.42	2.42	
BH28	6.75	Axial	103.0	52.0	5.6	0.82	1.03	
Notes		1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation						
		2. Moisture Content of sample : as-received 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation						
Originator	Approved	POINT LOAD INDEX TESTS						 Figure F7 Sheet 18 of 18
DW	CD 05/03/2024							

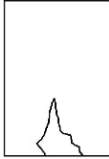
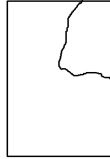


Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Exploration Point		BH03	BH04	BH09	BH09
Depth	m	2.30-2.60	4.70-5.00	3.50-3.73	5.40-5.70
Date Received		19/01/2024	19/01/2024	19/01/2024	19/01/2024
Date Tested		26/01/2024	09/02/2024	26/01/2024	26/01/2024
Length	mm	173.7	195.5	116.1	208.1
Mean Diameter	mm	79.7	103.6	103.1	103.2
Length / Diameter Ratio		2.18	1.89	1.13	2.02
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0017	0.0015	0.0034	0.0012
Bulk Density	Mg/m ³	2.67	2.45	2.73	2.6
Moisture Content	%	0.3	1.8	0.2	0.3
Degree of Saturation	%	As received	As received	As received	As received
Stress Rate	MPa/sec	0.60	0.50	0.60	0.60
Test Duration		6mins 50secs	1min 20secs	3mins 17secs	1mins 43secs
Failure Load	kN	490	98.1	352.9	220.5
Uniaxial Compressive Strength	MPa	98.2	11.6	42.3	26.4
Type of Failure		Explosive	Normal	Normal	Normal
Strength Classification		Strong	Weak	Med strong	Med strong
Associated Comment Numbers (see notes)			3,7	3	7
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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ASTM Methods

**Figure F8**

Sheet 1 of 1

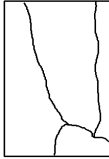


Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Exploration Point		BH11	BH13	BH13	BH14
Depth	m	3.60-3.90	2.00-2.33	5.15-5.70	2.77-3.06
Date Received		19/01/2024	19/01/2024	19/01/2024	19/01/2024
Date Tested		26/01/2024	26/01/2024	26/01/2024	26/01/2024
Length	mm	166.3	127.6	211.7	167.5
Mean Diameter	mm	80	103.2	103.2	79.7
Length / Diameter Ratio		2.08	1.24	2.05	2.10
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0018	0.0024	0.0019	0.0018
Bulk Density	Mg/m ³	2.69	2.72	2.7	2.7
Moisture Content	%	0.1	0.2	0.1	0.2
Degree of Saturation	%	As received	As received	As received	As received
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		2mins 34secs	3mins 12secs	3mins 37secs	4mins 34secs
Failure Load	kN	177.8	339	425	338.1
Uniaxial Compressive Strength	MPa	35.4	40.5	50.8	67.8
Type of Failure		Normal	Normal	Normal	Normal
Strength Classification		Med strong	Med strong	Strong	Strong
Associated Comment Numbers (see notes)			3		
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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ASTM Methods

**Figure F9**

Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Exploration Point		BH14	BH15	BH15	BH16
Depth	m	4.70-5.17	1.65-2.00	5.10-5.45	5.25-5.55
Date Received		19/01/2024	19/01/2024	19/01/2024	19/01/2024
Date Tested		26/01/2024	26/01/2024	26/01/2024	26/01/2024
Length	mm	169.7	198.5	165.2	212.3
Mean Diameter	mm	79.7	103.5	79.7	103.3
Length / Diameter Ratio		2.13	1.92	2.07	2.06
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0015	0.0015	0.0024	0.0014
Bulk Density	Mg/m ³	2.68	2.73	2.61	2.69
Moisture Content	%	0.4	0.3	0.1	0.1
Degree of Saturation	%	As received	As Received	As Received	As received
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		3mins 45secs	3mins 47secs	5mins 6secs	2mins 38secs
Failure Load	kN	274.4	428	360.8	309.9
Uniaxial Compressive Strength	MPa	55.0	50.9	72.3	37.0
Type of Failure		Normal	Explosive	Explosive	Normal
Strength Classification		Strong	Strong	Strong	Med strong
Associated Comment Numbers (see notes)			3		
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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ASTM Methods

**Figure F10**

Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Exploration Point		BH17	BH19	BH19	BH20
Depth	m	4.60-5.23	3.62-4.03	4.85-5.15	1.50-2.20
Date Received		19/01/2024	19/01/2024	19/01/2024	19/01/2024
Date Tested		26/01/2024	26/01/2024	26/01/2024	26/01/2024
Length	mm	162.8	212.2	179	146.6
Mean Diameter	mm	79.4	103.3	103.5	103.2
Length / Diameter Ratio		2.05	2.05	1.73	1.42
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0018	0.0014	0.0014	0.0014
Bulk Density	Mg/m ³	2.69	2.64	2.77	2.73
Moisture Content	%	0.2	0.2	0.2	0.5
Degree of Saturation	%	As Received	As received	As received	As Received
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		5mins 20secs	4mins 45secs	5mins 24secs	1min 35secs
Failure Load	kN	405	530	605	135.2
Uniaxial Compressive Strength	MPa	81.8	63.2	71.9	16.2
Type of Failure		Explosive	Normal	Explosive	Normal
Strength Classification		Strong	Strong	Strong	Weak
Associated Comment Numbers (see notes)				3	3,7
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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ASTM Methods

**Figure F11**

Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Exploration Point		BH21	BH23	BH26	BH26
Depth	m	7.00-7.20	2.16-2.35	6.00-6.30	8.00-8.20
Date Received		15/12/2023	19/01/2024	15/12/2023	15/12/2023
Date Tested		21/12/2023	26/01/2024	21/12/2023	21/12/2023
Length	mm	235.3	133.5	238.6	157.7
Mean Diameter	mm	103.4	103.4	103.6	103.1
Length / Diameter Ratio		2.28	1.29	2.30	1.53
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0	0.0019	0	0
Bulk Density	Mg/m ³	2.73	2.62	2.6	2.63
Moisture Content	%	0.3	0.4	0.2	0.1
Degree of Saturation	%	As Received	As received	As Received	As Received
Stress Rate	MPa/sec	0.70	0.60	0.70	0.70
Test Duration		2mins 8secs	2mins 47secs	4mins 50secs	2mins 26secs
Failure Load	kN	279.6	333.9	594	261
Uniaxial Compressive Strength	MPa	33.3	39.8	70.5	31.3
Type of Failure		Normal	Normal	Normal	Normal
Strength Classification		Medium Strong	Med strong	Strong	Weak
Associated Comment Numbers (see notes)			3		3
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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ASTM Methods

**Figure F12**

Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Exploration Point		BH27	BH28	BH28	
Depth	m	7.80-8.35	5.30-5.60	6.40-6.70	
Date Received		19/01/2024	19/01/2024	19/01/2024	
Date Tested		26/01/2024	26/01/2024	26/01/2024	
Length	mm	205.5	215	189.1	
Mean Diameter	mm	103.1	103.3	103.4	
Length / Diameter Ratio		1.99	2.08	1.83	
Straightness Compliance (see notes)	Y/N	Y	Y	Y	
Flatness Compliance (see notes)	Y/N	Y	Y	Y	
Perpendicularity	mm	0.0019	0.0012	0.0016	
Bulk Density	Mg/m ³	2.67	2.57	2.7	
Moisture Content	%	0.5	0.2	0.2	
Degree of Saturation	%	As received	As received	As received	
Stress Rate	MPa/sec	0.60	0.60	0.60	
Test Duration		4mins 2secs	1min 29secs	40secs	
Failure Load	kN	467	175.6	80.3	
Uniaxial Compressive Strength	MPa	55.9	21.0	9.6	
Type of Failure		Normal	Normal	Normal	
Strength Classification		Strong	Weak	Weak	
Associated Comment Numbers (see notes)		3	7	7	
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

Originator

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DW

CD
05/03/2024**UNIAXIAL COMPRESSIVE STRENGTH**

ASTM Methods

**Figure F13**

Sheet 1 of 1



Site	LT521 FASNAKYLE 400KV SUBSTATION
Client	SSEN Transmission
Engineer	Jacobs

Contract No	26560
Hole ID	BH03
Sample Ref	
Depth (m)	2.30
Sample Type	C



Originator

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DW

CD
05/03/2024

PHOTOGRAPHS OF SPECIMEN FAILURE



Figure F14

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH04
	Engineer	Jacobs	Sample Ref	
			Depth (m)	4.70
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F15
DW	 05/03/2024		

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH09
	Engineer	Jacobs	Sample Ref	
			Depth (m)	3.50
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F16
DW	 05/03/2024		

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH09
	Engineer	Jacobs	Sample Ref	
			Depth (m)	5.40
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F17
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH11
	Engineer	Jacobs	Sample Ref	
			Depth (m)	3.60
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F18
DW	CD 05/03/2024		
			Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Hole ID BH13

Sample Ref

Depth (m) 2.00

Sample Type C



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05/03/2024

PHOTOGRAPHS OF SPECIMEN FAILURE



Figure F19

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH13
	Engineer	Jacobs	Sample Ref	
			Depth (m)	5.15
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F20
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH14
	Engineer	Jacobs	Sample Ref	
			Depth (m)	2.77
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F21
DW	CD 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH14
	Engineer	Jacobs	Sample Ref	
			Depth (m)	4.70
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F22
DW	 05/03/2024		

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH15
	Engineer	Jacobs	Sample Ref	
			Depth (m)	1.65
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F23
DW	 05/03/2024		
			Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Hole ID BH15

Sample Ref

Depth (m) 5.10

Sample Type C



Originator

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Approved

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05/03/2024

PHOTOGRAPHS OF SPECIMEN FAILURE



Figure F24

Sheet 1 of 1



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No **26560**

Hole ID BH16

Sample Ref

Depth (m) 5.25

Sample Type C



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05/03/2024

PHOTOGRAPHS OF SPECIMEN FAILURE



Figure F25

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH17
	Engineer	Jacobs	Sample Ref	
			Depth (m)	4.60
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F26
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH19
	Engineer	Jacobs	Sample Ref	
			Depth (m)	3.62
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F27
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH19
	Engineer	Jacobs	Sample Ref	
			Depth (m)	4.85
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F28
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH20
	Engineer	Jacobs	Sample Ref	
			Depth (m)	1.50
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F29
DW	 05/03/2024		
Sheet 1 of 1			

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH21
	Engineer	Jacobs	Sample Ref	
			Depth (m)	7.00
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F30
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH23
	Engineer	Jacobs	Sample Ref	
			Depth (m)	2.16
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F31
DW	CD 05/03/2024		
			Sheet 1 of 1

igne	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH26
	Engineer	Jacobs	Sample Ref	
			Depth (m)	6.00
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE Figure F32	Sheet 1 of 1
DW	CD 05/03/2024		



Site LT521 FASNAKYLE 400KV SUBSTATION

Client SSEN Transmission

Engineer Jacobs

Contract No 26560

Hole ID BH26

Sample Ref

Depth (m) 7.90

Sample Type C



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05/03/2024

PHOTOGRAPHS OF SPECIMEN FAILURE



Figure F33

Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH27
	Engineer	Jacobs	Sample Ref	
			Depth (m)	7.80
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F34
DW	 05/03/2024		
Sheet 1 of 1			

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH28
	Engineer	Jacobs	Sample Ref	
			Depth (m)	5.30
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F35
DW	 05/03/2024		
			Sheet 1 of 1

	Site	LT521 FASNAKYLE 400KV SUBSTATION	Contract No	26560
	Client	SSEN Transmission	Hole ID	BH28
	Engineer	Jacobs	Sample Ref	
			Depth (m)	6.40
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	 Figure F36
DW	 05/03/2024		
			Sheet 1 of 1

LABORATORY TEST CERTIFICATE



Certificate No : 24/025 - 01-1
To : Stephen McDonagh
Client : Igne
62 Rochsolloch Road
Airdrie
North Lanarkshire
ML6 9BG

10 Queenslie Point
Queenslie Industrial Estate
120 Stepps Road
Glasgow
G33 3NQ

Tel: 0141 774 4032

email: info@mattest.org
Website: www.mattest.org

DETERMINATION OF THE RESISTANCE TO WEAR (micro-Deval) - BS EN 1097-1 : 2011

Introduction

We refer to a sample taken from LT521 Fasnakyle 400kV Substation and delivered to our laboratory on 09th January 2024.

Material & Source

Sample Reference	:	2013222
Sampled By	:	Client
Sampling Certificate	:	Not Supplied
Location	:	BH25, C, 11.10-11.60m
Designation (d/D)	:	Not Supplied
Description	:	Pinkish brown CRUSHED ROCK
Date Sampled	:	Not Supplied
Date Tested	:	09th January 2024 Onwards
Source	:	A15075-R1 - LT521 Fasnakyle 400kV Substation
Size Fraction	:	10mm to 14mm
Test Condition	:	Wet

Test Results

Test Specimen 1	55.7
Test Specimen 2	57.6
micro-Deval coefficient, M_{DE}	57

Comments

The results contained in this test certificate relate to the sample(s) as received
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This test certificate should not be reproduced without the written approval of the laboratory
All remaining samples for this project will be disposed of 7 days after issue of this test certificate

Remarks

Approved for Issue

T McLelland (Director)

Date 16/01/2024



2643



Certificate of Analysis

Certificate Number 24-01641-0

Issued: 04-Mar-24

Client Terra Tek
62 Rochsolloch Road
Airdrie
ML6 9BG

Our Reference 24-01641-0

Client Reference A15075-R2

Order No (not supplied)

Contract Title A15075-R2 / FASNAKYLE

Description 3 Aggregate samples.

Date Received 26-Jan-24

Date Started 26-Jan-24

Date Completed 04-Mar-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 24-01641, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Aggregate Samples

Our Ref 24-01641-0

Client Ref A15075-R2

Contract Title A15075-R2 / FASNAKYLE

Lab No	2291430	2291431	2291432
Sample ID	BH18	BH21	BH24
Depth	3.10	3.30-3.60	3.50-3.70
Other ID	2013649	2013656	2013657
Sample Type	C	C	C
Sampling Date	23/11/2023	21/11/2023	16/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Inorganics						
pH	DETSC 2008#		pH	9.0	7.3	8.1
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	18	27	< 10
Sulphur as S, Total	DETSC 2320	0.01	%	0.02	0.05	0.01
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.02	0.09	0.02

Information in Support of the Analytical Results

Our Ref 24-01641-0
 Client Ref A15075-R2
 Contract A15075-R2 / FASNAKYLE

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2291430	BH18 3.10 AGGREGATE	23/11/23	PG	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2291431	BH21 3.30-3.60 AGGREGATE	21/11/23	PG	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2291432	BH24 3.50-3.70 AGGREGATE	16/11/23	PG	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	

Key: P-Plastic G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 24-01642-0

Issued: 04-Mar-24

Client Terra Tek
62 Rochsolloch Road
Airdrie
ML6 9BG

Our Reference 24-01642-0

Client Reference A15075-R3

Order No (not supplied)

Contract Title A15075-R3 / FASNAKYLE

Description One Core sample.

Date Received 26-Jan-24

Date Started 26-Jan-24

Date Completed 04-Mar-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 24-01642, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Core Samples

Our Ref 24-01642-0

Client Ref A15075-R3

Contract Title A15075-R3 / FASNAKYLE

Lab No	2291433
Sample ID	BH19
Depth	
Other ID	2013664
Sample Type	C
Sampling Date	08/12/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
pH	DETSC 2008#		pH	8.9
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	30
Sulphur as S, Total	DETSC 2320	0.01	%	0.43
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	1.1

Information in Support of the Analytical Results

Our Ref 24-01642-0
 Client Ref A15075-R3
 Contract A15075-R3 / FASNAKYLE

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2291433	BH19 CORE	08/12/23		PG	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	

Key: P-Plastic G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Site: LT521 FASNAKYLE 400KV SUBSTATION

Contract No: 26560

Client: SSEN Transmission

Engineer: Jacobs

Style: APPENDIX A File: P:\GINTWP\PROJECTS\26560.GPJ Printed: 05/02/2024 11:16:20 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

APPENDIX G
GEOCHEMICAL TESTING





Certificate of Analysis

Certificate Number 23-27909

Issued: 08-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-27909

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE

Description 2 Soil samples.

Date Received 27-Nov-23

Date Started 27-Nov-23

Date Completed 08-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-27909

Client Ref 26560

Contract Title LT521 FASNAKYLE

Lab No	2268558	2268559
Sample ID	BH24A	BH26A
Depth	0.50	0.30
Other ID		
Sample Type	ES	ES
Sampling Date	20/11/2023	20/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	2.0	0.9
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	17	12
Copper	DETSC 2301#	0.2	mg/kg	11	5.6
Lead	DETSC 2301#	0.3	mg/kg	12	8.0
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.3	3.4
Zinc	DETSC 2301#	1	mg/kg	36	27
Inorganics					
pH	DETSC 2008#		pH	6.5	5.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.3
Organic matter	DETSC 2002#	0.1	%	1.2	2.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	13	17
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-27909

Client Ref 26560

Contract Title LT521 FASNAKYLE

Lab No	2268558	2268559
Sample ID	BH24A	BH26A
Depth	0.50	0.30
Other ID		
Sample Type	ES	ES
Sampling Date	20/11/2023	20/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-27909

Client Ref 26560

Contract Title LT521 FASNAKYLE

Lab No	2268558	2268559
Sample ID	BH24A	BH26A
Depth	0.50	0.30
Other ID		
Sample Type	ES	ES
Sampling Date	20/11/2023	20/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-27909

Client Ref 26560

Contract Title LT521 FASNAKYLE

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2268558	BH24A 0.50	SOIL	NAD	none	Steven Lambert
2268559	BH26A 0.30	SOIL	NAD	none	Steven Lambert

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-27909
 Client Ref 26560
 Contract LT521 FASNAKYLE

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2268558	BH24A 0.50 SOIL	20/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2268559	BH26A 0.30 SOIL	20/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-27898

Issued: 08-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-27898

Client Reference It521

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 2 Soil samples.

Date Received 27-Nov-23

Date Started 27-Nov-23

Date Completed 08-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-27898

Client Ref It521

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2268485	2268486
Sample ID	TP29	TP30
Depth	0.50	0.90
Other ID		
Sample Type	ES	ES
Sampling Date	21/11/2023	21/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	11	1.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	13	19
Copper	DETSC 2301#	0.2	mg/kg	20	7.4
Lead	DETSC 2301#	0.3	mg/kg	100	6.8
Mercury	DETSC 2325#	0.05	mg/kg	0.28	< 0.05
Nickel	DETSC 2301#	1	mg/kg	6.5	8.5
Zinc	DETSC 2301#	1	mg/kg	24	26
Inorganics					
pH	DETSC 2008#		pH	5.5	6.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	1.7	0.2
Organic matter	DETSC 2002#	0.1	%	1.8	18
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	71	30
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-27898

Client Ref It521

Contract Title LT521 FASNAKYLE 400KV SUBSTATION

Lab No	2268485	2268486
Sample ID	TP29	TP30
Depth	0.50	0.90
Other ID		
Sample Type	ES	ES
Sampling Date	21/11/2023	21/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	2.7	< 0.3
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-27898

Client Ref It521

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2268485	2268486
Sample ID	TP29	TP30
Depth	0.50	0.90
Other ID		
Sample Type	ES	ES
Sampling Date	21/11/2023	21/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-27898

Client Ref lt521

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2268485	TP29 0.50	SOIL	NAD	none	Steven Lambert
2268486	TP30 0.90	SOIL	NAD	none	Steven Lambert

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-27898
 Client Ref It521
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2268485	TP29 0.50 SOIL	21/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2268486	TP30 0.90 SOIL	21/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-28008

Issued: 08-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28008

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 3 Soil samples.

Date Received 28-Nov-23

Date Started 28-Nov-23

Date Completed 08-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-28008

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2268940	2268941	2268942
Sample ID	TP32	TP35	TP20
Depth	0.50	1.00	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	22/11/2023	22/11/2023	22/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	10	1.2	1.3
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	2.2	0.3	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	28	18	17
Copper	DETSC 2301#	0.2	mg/kg	120	29	8.4
Lead	DETSC 2301#	0.3	mg/kg	89	11	6.8
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.06
Nickel	DETSC 2301#	1	mg/kg	13	7.5	8.1
Zinc	DETSC 2301#	1	mg/kg	620	140	63
Inorganics						
pH	DETSC 2008#		pH	9.1	6.2	6.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.6	1.8	1.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	450	36	57
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28008

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2268940	2268941	2268942
Sample ID	TP32	TP35	TP20
Depth	0.50	1.00	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	22/11/2023	22/11/2023	22/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-28008

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2268940	2268941	2268942
Sample ID	TP32	TP35	TP20
Depth	0.50	1.00	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	22/11/2023	22/11/2023	22/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28008

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2268940	TP32 0.50	SOIL	NAD	none	Michael Kay
2268941	TP35 1.00	SOIL	NAD	none	Michael Kay
2268942	TP20 1.00	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-28008
 Client Ref 26560
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2268940	TP32 0.50 SOIL	22/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2268941	TP35 1.00 SOIL	22/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2268942	TP20 1.00 SOIL	22/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-28158-0

Issued: 26-Jan-24

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28158-0

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 3 Soil samples.

Date Received 29-Nov-23

Date Started 29-Nov-23

Date Completed 26-Jan-24

Test Procedures Identified by prefix DETSn (details on request).

Notes This report supersedes 23-28158, amendments made

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-28158-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2269798	2269799	2269800
Sample ID	TP21	TP31	BH18
Depth	0.50	0.50	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	23/11/2023	23/11/2023	23/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	1.8	0.7	0.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	1.7	10	7.3
Copper	DETSC 2301#	0.2	mg/kg	6.2	12	4.2
Lead	DETSC 2301#	0.3	mg/kg	12	5.6	3.5
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	2.0	3.0	2.1
Zinc	DETSC 2301#	1	mg/kg	20	23	14
Inorganics						
pH	DETSC 2008#		pH	4.1	5.2	5.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.9	0.3	0.2
Organic matter	DETSC 2002#	0.1	%	13	3.0	4.4
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	14	< 10	< 10
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	1.2	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28158-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2269798	2269799	2269800
Sample ID	TP21	TP31	BH18
Depth	0.50	0.50	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	23/11/2023	23/11/2023	23/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.4	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.9	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	11	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	13	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	4.6	0.7	0.6
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28158-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2269798	2269799	2269800
Sample ID	TP21	TP31	BH18
Depth	0.50	0.50	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	23/11/2023	23/11/2023	23/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28158-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2269798	TP21 0.50	SOIL	NAD	none	D Wilkinson
2269799	TP31 0.50	SOIL	NAD	none	D Wilkinson
2269800	BH18 1.00	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-28158-0
 Client Ref 26560
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2269798	TP21 0.50 SOIL	23/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2269799	TP31 0.50 SOIL	23/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2269800	BH18 1.00 SOIL	23/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-28261

Issued: 15-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28261

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 3 Soil samples.

Date Received 30-Nov-23

Date Started 30-Nov-23

Date Completed 15-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-28261

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2270382	2270383	2270384
Sample ID	TP37	TP10	TP06
Depth	0.50	1.00	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	24/11/2023	24/11/2023	24/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	0.7	5.3	1.4
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	7.4	24	13
Copper	DETSC 2301#	0.2	mg/kg	3.9	9.5	7.0
Lead	DETSC 2301#	0.3	mg/kg	4.5	55	4.8
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	2.9	12	4.7
Zinc	DETSC 2301#	1	mg/kg	16	56	19
Inorganics						
pH	DETSC 2008#		pH	5.8	5.5	5.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.2	0.1
Organic matter	DETSC 2002#	0.1	%	2.1	3.8	3.6
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	16	< 10	< 10
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.07
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.08	< 0.01	0.08
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	0.10	< 0.01	0.09
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28261

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2270382	2270383	2270384
Sample ID	TP37	TP10	TP06
Depth	0.50	1.00	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	24/11/2023	24/11/2023	24/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-28261

Client Ref 26560

Contract Title LT521 FASNAKYLE 400KV SUBSTATION

Lab No	2270382	2270383	2270384
Sample ID	TP37	TP10	TP06
Depth	0.50	1.00	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	24/11/2023	24/11/2023	24/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28261

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2270382	TP37 0.50	SOIL	NAD	none	Pierce Booth
2270383	TP10 1.00	SOIL	NAD	none	Pierce Booth
2270384	TP06 0.50	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-28261
 Client Ref 26560
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2270382	TP37 0.50 SOIL	24/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2270383	TP10 1.00 SOIL	24/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2270384	TP06 0.50 SOIL	24/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-28262-0

Issued: 26-Jan-24

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28262-0

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 4 Soil samples.

Date Received 30-Nov-23

Date Started 30-Nov-23

Date Completed 26-Jan-24

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 23-28262, amendments made**

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-28262-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2270385	2270386	2270387	2270388
Sample ID	TP16	TP33	TP14	BH27
Depth	0.50	1.00	0.50	1.00
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	4.0	2.4	1.1	0.9
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.7	0.9	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	17	13	37	17
Copper	DETSC 2301#	0.2	mg/kg	14	17	7.7	5.1
Lead	DETSC 2301#	0.3	mg/kg	4.1	7.1	1.9	2.1
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.3	6.4	11	6.6
Zinc	DETSC 2301#	1	mg/kg	41	38	25	30
Inorganics							
pH	DETSC 2008#		pH	6.9	8.5	7.3	7.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	< 0.1	< 0.1	0.1
Organic matter	DETSC 2002#	0.1	%	1.5	1.1	1.0	1.5
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	27	96	14	14
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28262-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2270385	2270386	2270387	2270388
Sample ID	TP16	TP33	TP14	BH27
Depth	0.50	1.00	0.50	1.00
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	< 0.3	< 0.3	< 0.3
VOCs							
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-28262-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2270385	2270386	2270387	2270388
Sample ID	TP16	TP33	TP14	BH27
Depth	0.50	1.00	0.50	1.00
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	27/11/2023	27/11/2023	27/11/2023	27/11/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28262-0

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2270385	TP16 0.50	SOIL	NAD	none	Pierce Booth
2270386	TP33 1.00	SOIL	NAD	none	Pierce Booth
2270387	TP14 0.50	SOIL	NAD	none	Pierce Booth
2270388	BH27 1.00	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-28262-0
 Client Ref 26560
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2270385	TP16 0.50 SOIL	27/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2270386	TP33 1.00 SOIL	27/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2270387	TP14 0.50 SOIL	27/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2270388	BH27 1.00 SOIL	27/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-28468

Issued: 18-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28468

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 2 Soil samples.

Date Received 04-Dec-23

Date Started 04-Dec-23

Date Completed 18-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-28468

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2271575	2271576
Sample ID	TP05	BH15
Depth	0.50	0.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	28/11/2023	28/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	2.2	2.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.5
Chromium	DETSC 2301#	0.15	mg/kg	17	2.7
Copper	DETSC 2301#	0.2	mg/kg	9.9	9.8
Lead	DETSC 2301#	0.3	mg/kg	6.0	24
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.2	2.9
Zinc	DETSC 2301#	1	mg/kg	37	91
Inorganics					
pH	DETSC 2008#		pH	6.6	6.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.4	0.7
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	32	26
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28468

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2271575	2271576
Sample ID	TP05	BH15
Depth	0.50	0.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	28/11/2023	28/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-28468

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2271575	2271576
Sample ID	TP05	BH15
Depth	0.50	0.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	28/11/2023	28/11/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28468

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2271575	TP05 0.50	SOIL	NAD	none	Lee Kerridge
2271576	BH15 0.50	SOIL	NAD	none	Lee Kerridge

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-28468
 Client Ref 26560
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2271575	TP05 0.50 SOIL	28/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2271576	BH15 0.50 SOIL	28/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-28626

Issued: 19-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28626

Client Reference 26560

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 3 Soil samples.

Date Received 05-Dec-23

Date Started 05-Dec-23

Date Completed 19-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28626

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2272260	2272261	2272262
Sample ID	TP02	TP07	TP12
Depth	0.50	0.50	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	29/11/2023	29/11/2023	29/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	1.4	1.9	1.2
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	12	14	16
Copper	DETSC 2301#	0.2	mg/kg	4.2	7.0	2.9
Lead	DETSC 2301#	0.3	mg/kg	4.7	4.7	8.4
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	4.6	6.5	3.2
Zinc	DETSC 2301#	1	mg/kg	24	31	18
Inorganics						
pH	DETSC 2008#		pH	6.6	6.6	5.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.1	0.3
Organic matter	DETSC 2002#	0.1	%	2.7	2.6	6.6
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	16	< 10	18
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	0.04	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.04	< 0.01	0.05
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.02
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 23-28626

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2272260	2272261	2272262
Sample ID	TP02	TP07	TP12
Depth	0.50	0.50	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	29/11/2023	29/11/2023	29/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	0.7
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-28626

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2272260	2272261	2272262
Sample ID	TP02	TP07	TP12
Depth	0.50	0.50	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	29/11/2023	29/11/2023	29/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28626

Client Ref 26560

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2272260	TP02 0.50	SOIL	NAD	none	Josh Best
2272261	TP07 0.50	SOIL	NAD	none	Josh Best
2272262	TP12 0.50	SOIL	NAD	none	Josh Best

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-28626
 Client Ref 26560
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2272260	TP02 0.50 SOIL	29/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2272261	TP07 0.50 SOIL	29/11/23	GJ 250ml, GJ 60ml, PT 1L x2		
2272262	TP12 0.50 SOIL	29/11/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-29162

Issued: 22-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-29162

Client Reference 26500

Order No (not supplied)

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Description 3 Soil samples.

Date Received 11-Dec-23

Date Started 11-Dec-23

Date Completed 22-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis Soil Samples

Our Ref 23-29162

Client Ref 26500

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2275378	2275379	2275380
Sample ID	TP03	TP08	BH14
Depth	0.50	0.50	0.50
Other ID			
Sample Type	ES	ES	ES
Sampling Date	04/12/2023	04/12/2023	04/12/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	2.6	4.0	1.5
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	1.0	2.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	17	18	22
Copper	DETSC 2301#	0.2	mg/kg	5.1	13	7.7
Lead	DETSC 2301#	0.3	mg/kg	5.8	12	3.9
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	7.6	11	6.3
Zinc	DETSC 2301#	1	mg/kg	34	68	28
Inorganics						
pH	DETSC 2008#		pH	6.5	7.2	6.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	< 0.1	0.1
Organic matter	DETSC 2002#	0.1	%	3.6	1.5	2.7
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	40	90	30
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 23-29162

Client Ref 26500

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2275378	2275379	2275380
Sample ID	TP03	TP08	BH14
Depth	0.50	0.50	0.50
Other ID			
Sample Type	ES	ES	ES
Sampling Date	04/12/2023	04/12/2023	04/12/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	< 0.3	< 0.3
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 23-29162

Client Ref 26500

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	2275378	2275379	2275380
Sample ID	TP03	TP08	BH14
Depth	0.50	0.50	0.50
Other ID			
Sample Type	ES	ES	ES
Sampling Date	04/12/2023	04/12/2023	04/12/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Asbestos Analysis Soil Samples

Our Ref 23-29162

Client Ref 26500

Contract Title LT521 FASNAKYLE 400kV SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2275378	TP03 0.50	SOIL	NAD	none	Barry Kelly
2275379	TP08 0.50	SOIL	NAD	none	Barry Kelly
2275380	BH14 0.50	SOIL	NAD	none	Barry Kelly

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-29162
 Client Ref 26500
 Contract LT521 FASNAKYLE 400kV SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2275378	TP03 0.50 SOIL	04/12/23	GJ 250ml, GJ 60ml, PT 1L x2		
2275379	TP08 0.50 SOIL	04/12/23	GJ 250ml, GJ 60ml, PT 1L x2		
2275380	BH14 0.50 SOIL	04/12/23	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 24-00791

Issued: 22-Jan-24

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 24-00791

Client Reference 26560

Order No (not supplied)

Contract Title LT521 Fasnakyle 400kV Substation

Description 1 Soil sample, 2 Leachate prepared by DETS samples.

Date Received 15-Jan-24

Date Started 15-Jan-24

Date Completed 22-Jan-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 24-00791

Client Ref 26560

Contract Title LT521 Fasnakyle 400kV Substation

Lab No	2286449
Sample ID	BH12
Depth	0.50
Other ID	
Sample Type	SOIL
Sampling Date	10/01/2024
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	1.3
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	13
Copper	DETSC 2301#	0.2	mg/kg	7.8
Lead	DETSC 2301#	0.3	mg/kg	4.7
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	6.9
Zinc	DETSC 2301#	1	mg/kg	30
Inorganics				
pH	DETSC 2008#		pH	6.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.6
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	2500
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10
PAHs				
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 24-00791

Client Ref 26560

Contract Title LT521 Fasnakyle 400kV Substation

Lab No	2286449
Sample ID	BH12
Depth	0.50
Other ID	
Sample Type	SOIL
Sampling Date	10/01/2024
Sampling Time	n/s

Test	Method	LOD	Units	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 24-00791

Client Ref 26560

Contract Title LT521 Fasnakyle 400kV Substation

Lab No	2286449
Sample ID	BH12
Depth	0.50
Other ID	
Sample Type	SOIL
Sampling Date	10/01/2024
Sampling Time	n/s

Test	Method	LOD	Units	
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Leachate Samples

Our Ref 24-00791

Client Ref 26560

Contract Title LT521 Fasnakyle 400kV Substation

Lab No	2286450	2286451
Sample ID	BH12	BH12
Depth	0.50	0.50
Other ID		
Sample Type	LEACHATE	LEACHATE
Sampling Date	10/01/2024	10/01/2024
Sampling Time	n/s	n/s

Test	Method	LOD	Units
Preparation			
BS EN 12457 2:1 WAC	DETSC 1009*		Y
BS EN 12457 8:1 WAC	DETSC 1009*		Y

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 24-00791

Client Ref 26560

Contract Title LT521 Fasnakyle 400kV Substation

Sample Id BH12 0.50

Sample Numbers 2286449 2286450 2286451

Date Analysed 19/01/2024

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	< 0.5
DETSC2003# Loss On Ignition	%	
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.31	0.19	< 0.002	< 0.01
DETSC 2306 Barium as Ba	3.6	4.5	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	1	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.74	0.6	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	0.013	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.58	0.33	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	0.28	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	2.2	< 1.3	0.004	< 0.01
DETSC 2055 Chloride as Cl	2600	650	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	3800	2100	< 20	< 100
DETSC 2009* Total Dissolved Solids	16000	9200	32	103.5
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	160000	8800	320	344.3

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	7.3	6.9
DETSC 2009 Conductivity uS/cm	23.5	13.1
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.118

Stage 1

Volume of Leachant L2*	0.224
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.944
Volume of Eluate VE2*	0.89

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis Soil Samples

Our Ref 24-00791

Client Ref 26560

Contract Title LT521 Fasnakyle 400kV Substation

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2286449	BH12 0.50	SOIL	NAD	none	D Wilkinson
Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.					

Information in Support of the Analytical Results

Our Ref 24-00791
 Client Ref 26560
 Contract LT521 Fasnakyle 400kV Substation

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2286449	BH12 0.50 SOIL	10/01/24	GJ 250ml, GJ 60ml, PT 1L x2		
2286450	BH12 0.50 LEACHATE	10/01/24	GJ 250ml, GJ 60ml, PT 1L x2		
2286451	BH12 0.50 LEACHATE	10/01/24	GJ 250ml, GJ 60ml, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

RAEBURN

DRILLING & GEOTECHNICAL LTD

Raeburn Drilling & Geotechnical
Whistleberry road
Hamilton
ML3 0HP

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref: RD24 23
Test Date: 20/06/2023
Report Date: 20/06/2023
File Name: RD24 23.spt
Test Operator: K STEELE

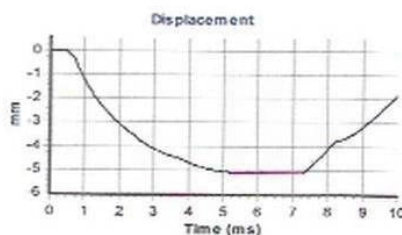
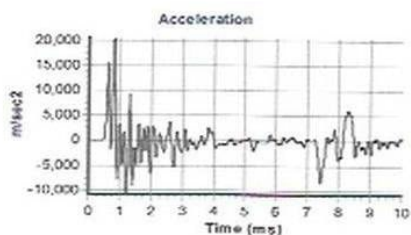
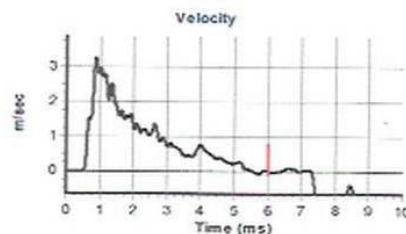
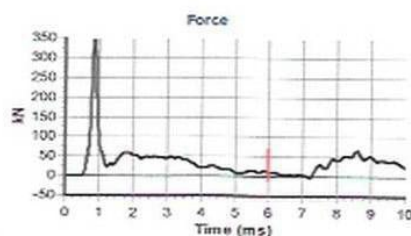
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.9
Assumed Modulus E_s (GPa): 208
Accelerometer No.1: 69559
Accelerometer No.2: 69560

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.5

Comments / Location



Calculations

Area of Rod A (mm^2): 1021
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 407

Energy Ratio E_r (%): **86**

Signed: Kevin Steele
Title: Head Storeman

The recommended calibration interval is 12 months

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Raeburn Drilling & Geotechnical
Whistleberry road
Hamilton
ML3 0HP

SPT Hammer Ref: RD51 2023

Test Date: 26/06/2023

Report Date: 26/06/2023

File Name: RD51 2023.spt

Test Operator: K STEELE

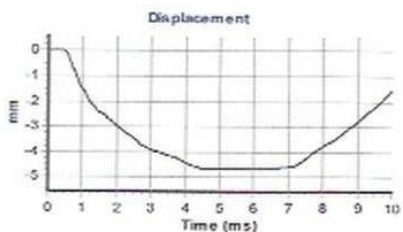
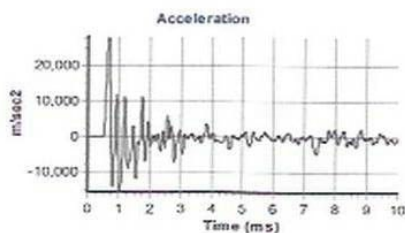
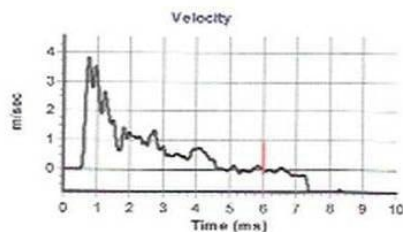
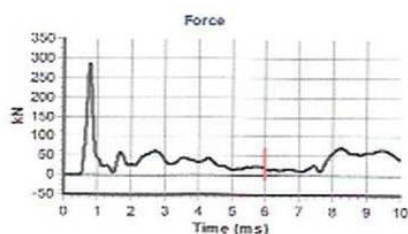
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.8
Assumed Modulus E_0 (GPa): 208
Accelerometer No.1: 69559
Accelerometer No.2: 69560

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.5

Comments / Location



Calculations

Area of Rod A (mm²): 1008
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 340

Energy Ratio E_r (%): 72

Signed: Kevin Steele

Title: Head Storeman

The recommended calibration interval is 12 months

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Raeburn Drilling & Geotechnical
Whistleberry road
Hamilton
ML3 0HP

SPT Hammer Ref: RD125 2023
Test Date: 08/03/2023
Report Date: 08/03/2023
File Name: RD125 2023.spt
Test Operator: KS

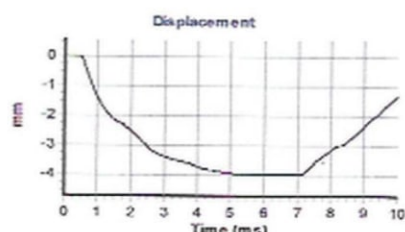
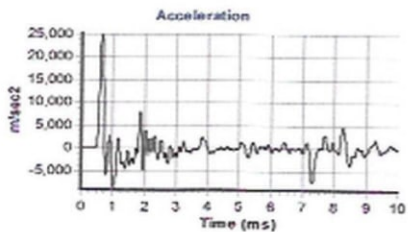
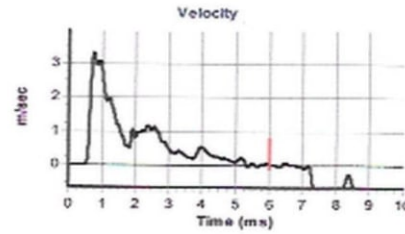
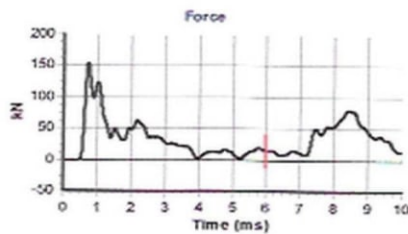
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 69559
Accelerometer No.2: 69560

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.5

Comments / Location



Calculations

Area of Rod A (mm²): 1008
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 284

Energy Ratio E_r (%): **60**


Signed: Kevin Steele
Title: Head Storeman

The recommended calibration interval is 12 months

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Certificate of calibration

Certificate number

CRU02-0120-20220906

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Calibration results zero-scale measurement

Reference zero scale value	Measured zero scale value	Uncertainty of calibration	Allowed minimum	Allowed maximum	Range	PASS (P)	FAIL (F)
909.1	909.1	0.2	908.7	909.5	R (ohm)	P	
96.59	96.57	0.00015	96.09	97.09	I (mA)	P	
1.00	1.00	7uV	0.99	1.01	U (V)	P	

AFTER ADJUSTMENT

Reference full scale value	Measured full scale value	Uncertainty of calibration	Allowed minimum	Allowed maximum	Range	PASS (P)	FAIL (F)
1299.8	1299.8	0.46	1298.8	1300.8	R (ohm)	P	
386.12	386.08	1	385.12	387.12	I (mA)	P	
4.00	4.00	0.34mV	3.96	4.04	U (V)	P	
1.0000	1.0000	0.00014	0.9994	1.0006	f (Hz)	P	

Serial number

0120

Date of calibration

06/09/2022

Manufacturer

Location of calibration

Model

Serial number

Date of calibration

Temperature (°C)

Humidity (% RH)

Leidendorp Instruments
Achthovenweg 19
2351AX Leidendorp
The Netherlands

CRU02

0120

06/09/2022

23+/-5°C

60+/-30%

Performed by
(calibration technician)
Signature

Peter Chung

