

An inspection of timber at

CLAYTON HALL, M11 4RU

INTRODUCTION

Following instructions from Michael Clarkson of Rosslee Construction, I visited the above building on 01.05.24.

This report is to be read in conjunction with one carried out by us in 2015 – appended on page 8.

As with the previous, the report is in the form of a schedule of photo observations reference to plans of the building on page 7.

A later addendum is shown on page 8, following a revisit 27/06/24.

1 Modern felt. Principal timbers with export marks indicating some replacement timber is imported <i>Pinus sylvestris</i>. Some replaced common rafters.		2 General arrangement – no comment.	
3 Goal post arrangement picking up purlin with reduced section in wall – all historic.		4 General arrangement. See previous photos	
5 General arrangement.		6 Bell turret foundation beams all sound. See previous photos.	

7

Probable entry point for squirrels and birds. No evidence of nesting found.



8

Comment as 7.



9

The nearest photo shows the detail in 2015. The furthest in 2024. (Resolution good to 300%).

The open brickwork does not seem to have moved significantly since 2015.



10

The photos – in the same order – also seem to indicate the same – although some loose bricks might have been removed more recently.

The truss is arrowed yellow. An additional (foundation (?)) beam has been planted in front of the tie beam (angle connection onto rafter plate – green arrow) – to support the ceiling and also the masonry skin above.



11

Showing the W bearing ends of the tie beam and foundation beam



12

W bearing spade end pattress plate for tie beam show in 10.



13

The plaster has been stripped around the first floor window on the S wall as part of the works to investigate the movement of the masonry in the S gable. The inner foundation beam has lost some section in the SE corner where it travels over the top of the frame. It was microdrilled (MD 2) and sufficient section was found to remain for the beam to perform. The upper face of the plate was sound at this point also. The bearing of the tie beam was drilled (MD 3) and found to be sound. The top of the frame was microdrilled (MD 4). Drilling showed it has lost some section at its back. This was drilled again (MD 5) and a good trace was obtained from this angle.

The outer timber against the wall seems to be a packer – possibly to pick up the edge of the ceiling. It has previously decayed over the frame.



14

The W bearing of the packer (which has no bearing due to previous decay in the SE corner) has decayed over the chimney breast. This decay is of some age.



The packer is in softwood, the tie beam and foundation/ceiling beam are in oak and therefore much more durable.

15

The drain for the downpipe in the SE corner of the building is blocked solid – and seems to have been for some time.

Additional perimeter water from the E side of the building will collect and be focused towards this corner.



16

There is a very low level of deathwatch beetle activity in the frame of the bathroom window – one beetle found. No action other than to ensure the building envelope remains watertight.



DISCUSSION & RECOMMENDATIONS

There were no signs of significant decay in what is considered to be the structural timbers. There is historic decay to the softwood timber against the S wall behind the truss – although this is possibly just a ‘packer’. Based on photos from 2015, the condition of the timber in general and the bulging masonry in the gable do not appear to have changed *significantly*. The photos from 2015 do show bulging in the masonry of the S gable and gaps opening in the courses – although it is difficult to confirm whether the movement is active.

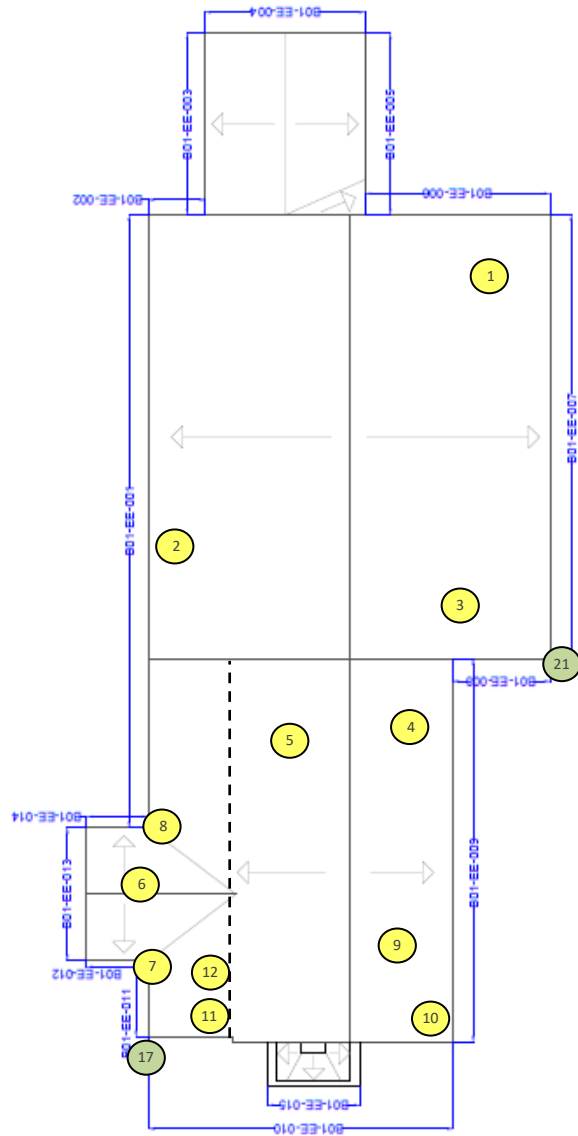
Whatever the case the masonry has clearly moved. Observations that might be useful for structural appraisal would be that the masonry below the large opening up in the masonry course I based on stretchers and headers - probably indicating a one brick wall. That above it shows only stretchers, possibly indicating a half brick wall that isn’t tied into anything. There also appear to be shifting in the masonry in the SW corner around the W bearing of the truss.

Also, at its base, the SE corner is very vulnerable to focused wetting – which could result in a degree of subsidence. Although there were no elevated internal timber moisture contents in this corner, the drainage system must be overhauled as a priority – and the external perimeter surface should be profiled to collect and discharge all water clear of the building. From memory after a look below floorboards – there may already have been some relatively recent remedial work carried out at ground floor level in this corner (?)

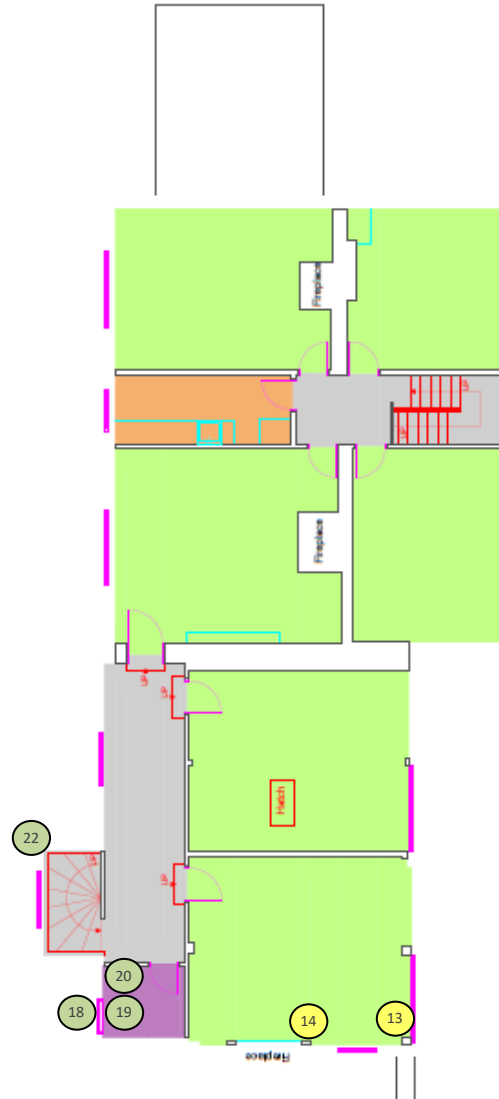
No treatment is required other than to ensure the building remains watertight.

Tim Floyd – May 2024

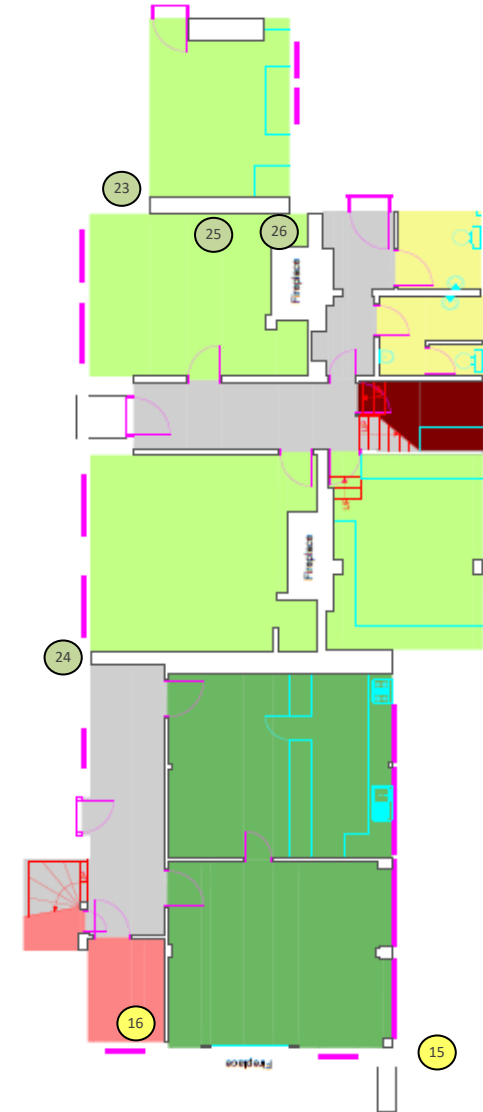
Roof



First floor



Ground



ADDENDUM – Site visit 27/06/2024

Following further instructions from Richard Broadbent of Manchester Council, we revisited the building to review two areas of the ground floor Kitchen and the area below the bell tower adjoining the spiral staircase in the first-floor office (front elevation). In addition, micro drilling was repeated from the original 2015 survey for points SP1 – SP7 and SP11 – SP14.

Additional photo observations have been included below and are referenced (in green) to the plans on page 7.

The microdrill table from the original 2015 report is shown below, with the areas redrilled and reassessed. The map of micro drilling locations has been added from the 2015 report. The most recent graphs are appended to the report.

PHOTO OBSERVATIONS

17. Verge board support and bracket require replacement.



18. Decay to juvenile wood (pith). Micro drilling shows good section remains (MD2 to 5, as marked). MD 1 shows loss of section to post foot - see ob 19 below.

Possibly consider filling the small cavities at end grain for weather proofing.



19. Base of wall stud has lost connection, where historic wood borer and possibly decay has caused loss of section to the end of the post and the mortise of the rail. Either replace stud or affect sectional face repair on this side.



20. Mortise has enlarged historically although connection is still viable. There is some slight instability in the panel which could be improved by stabilising the stud/plate connection.



21. The foot of the end rafter, verge board and rafter plate have all lost section historically – presumably due to blocked eaves gutter – and would benefit from local repair.



22. Historic decay to end of sole plate – see SP12/13 below.



23. It is understood this downpipe is blocked and floods the surrounding area regularly. As with previous comments, the condition of all subsurface drainage is integral to the overall condition of the building.



24. Foliage obscured access to downpipe.

Again see comments regarding drainage survey.



25. Historic (the timber is currently dry) decay to the base of the softwood skirting board which requires replacement.



26. Decay to the skirting board, requires replacement.

The damage seen in obs 25 and 26 would seem to be a direct result of the problems with the downpipe in ob 23.



MICRODRILL INTERPRETATION

Position	Microdrill data from 25.09.15		Microdrill data from 27.06.24	
	Graph no.	Comments	Graph no.	Comments
SP1	1	Extreme N end of plate only recorded 55 mm of material. This does not appear to be a decay trace and the graph probably represents the full depth of the plate at this point.	6	Same comment as 2015 survey
SP2	2	Sound to the full width of plate ($\approx$ 200 mm).	7	Sound to full width of plate, showing mortise and tenon in good condition.
SP3	3	Sound	8	Sound. It is likely the trace has gone through the lower end of the tenon as compared to 2015.
	4	Lower edge of plate sound		
SP4	5	Sound	9	Outer face of mortise and tenon sound, and then probe travelled through fissure on internal side of mortise.
	6	Lower edge of plate sound		
SP5	7	Sound	10	Sound
	8	Lower edge of plate sound	11	Lower edge of plate sound
SP6	9	Sound	12	Sound
	10	Base of adjacent post is sound – trace indicates possible separate section 100 – 180mm.		
SP7	11	Sound	13	Sound
			14	Lower edge of plate sound.
SP11	18	Sound	Not accessible due to foliage as obs. 24	

SP12	19	The mortise has been enlarged by decay – which has broken out of the N end via the juvenile wood (or pith). This is an exposed detail, where wind driven rain has caused decay in the top edge of the sole plate – see discussion.	15	Same comment as 2015 survey
	20	Lower edge - sound material, although showing cavity at 10cms – possibly indicating salvaged timber.	16	Cavity has expanded slightly
SP12/13	21	Trace indicates pocket of decay – probably lower channel has become enlarged. See discussion.	19	Trace indicates a pocket of decay.
SP13	22	Mortise is enlarged and tenon extinct.	17	Mortise is enlarged and tenon extinct
			18	Lower edge of plate sound
CP14			20	The outer 30mm of the foot of the corner post has deteriorated and requires a face repair
SP14	23	The mortise has been enlarged by decay, but the tenon is extant and the remaining material is dense – although the dowels have decayed – as they have along this entire length of plate. See discussion.	21	Different trace acquired this time – showing a sound but empty mortise. (Presumably the drill was at a different angle this time).
	24	Sound trace at lower edge, which again indicates the possibility of a mortise which extends the entire depth of the plate.	22	Same comment as 2015 survey

SP15	25	Sound trace showing mortise and tenon	3	Sound
	26	Sound lower edge.	4	Sound lower edge

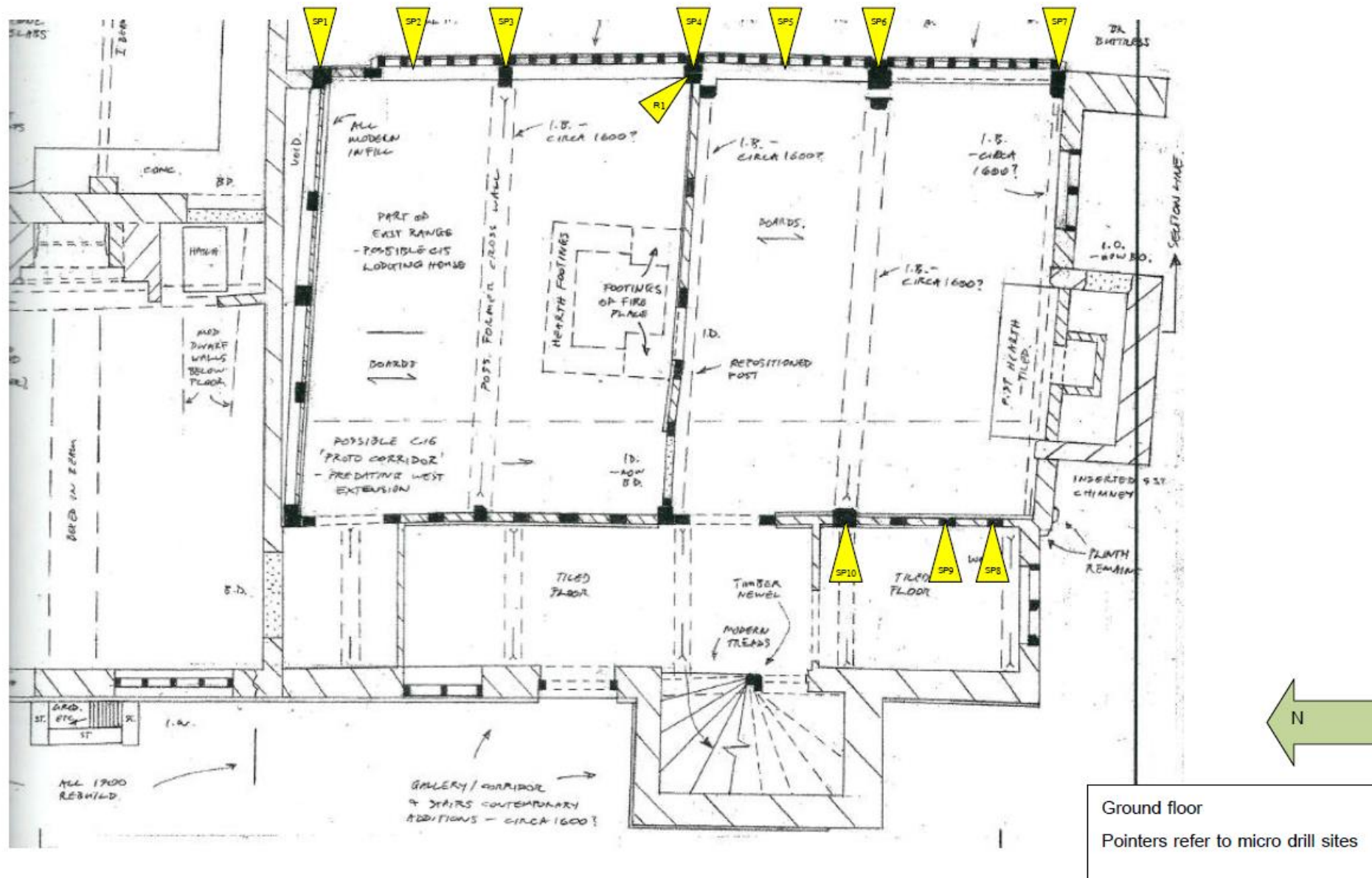
DISCUSSION AND CONCLUSION

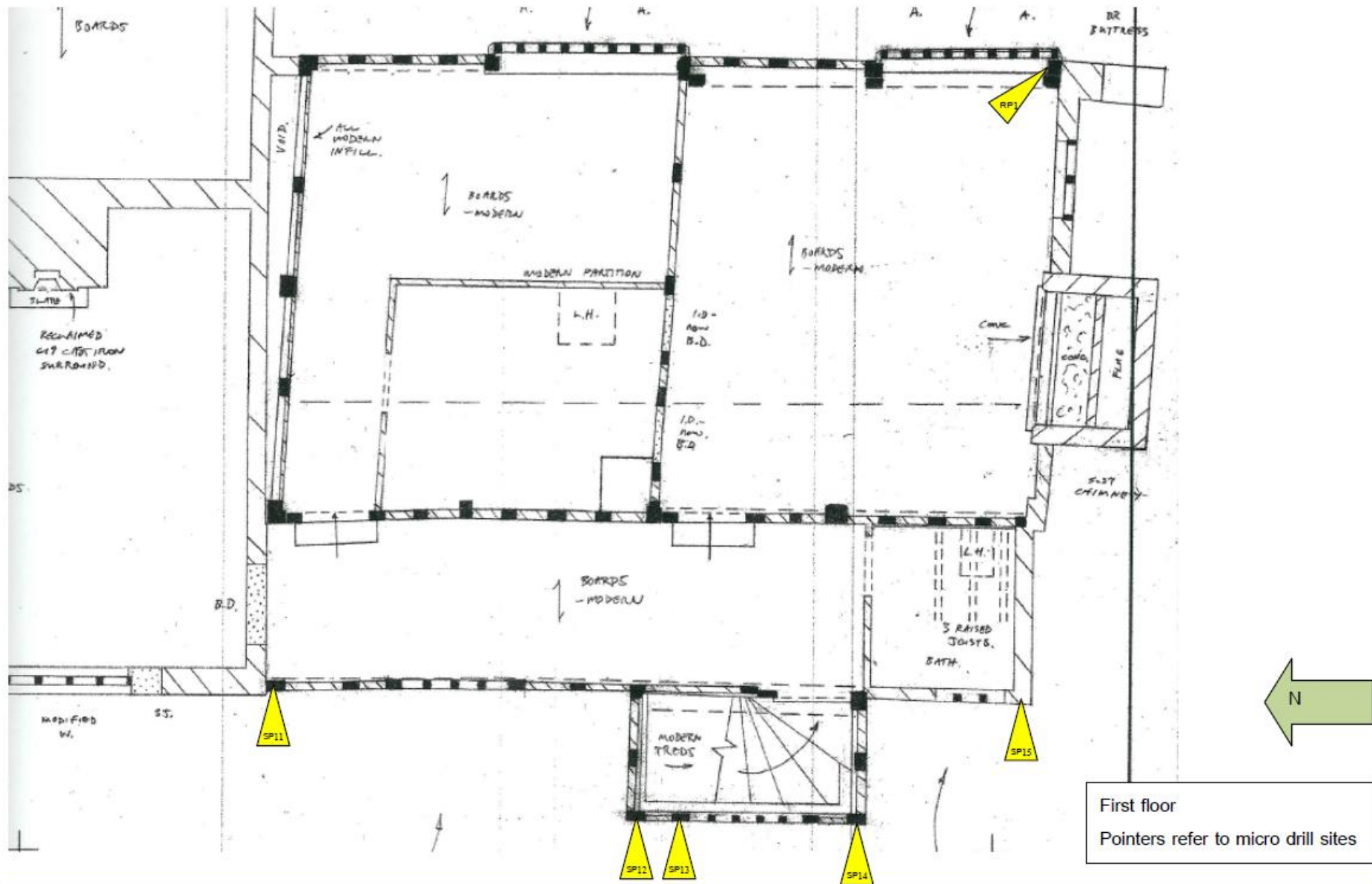
Based on the micodrilling, there has been very little change in the condition of the frame – possibly with the exception of ob 18 – where a cavity in the end grain may have opened up slightly. As such, the original comments from the 2015 survey still apply.

There is some historic decay to the base of the softwood skirting in the kitchen, the result of periodically blocked drains.

There is localised decay to timber roof joinery at high level. This will require close platformed access to affect repair. Internally the roof structures are sound.

Tim Floyd – July 2024





MICRO DRILL

The micro drill drills a 2mm diameter needle into the timber, measuring both the torque generated by the drill motor to turn the drill bit – known as 'drill' (dark green shaded curve on the graph) and-more importantly- the resistance being experienced by the motor responsible for sliding the whole mechanism forward at a pre-set rate – known as 'feed' (light green shaded curve).

The torque generated in the drill and the resistance experienced by the feed mechanism are generally correlative. However wet timber - or the existence of other materials such as resin which may have been used in past repair - can affect the drill to a greater or lesser extent than the feed.

Peaks in the graphs represent torque/resistance being experienced by the drill/feed. The Y axis is magnitude of resistance/torque, with 100(%) representing that value where the motor can no longer move the feed mechanism at its pre-set feed speed (which would require a reduction in the feed speed).

The machine has 5 pre-set feed speeds that can be used – dependent on the nature of the timber. For example, dense medieval oak generally requires a low feed speed of 25 - 100cm/min, softwood requires 100 – 150cm/min. The faster feed speeds of 175 and 250cm/min are more applicable to living trees (another application for this equipment). Adhering to these criteria means that any reading over around 30% amplitude (on the Y-axis) represents dense and sound timber – especially when lower feed speeds are used.

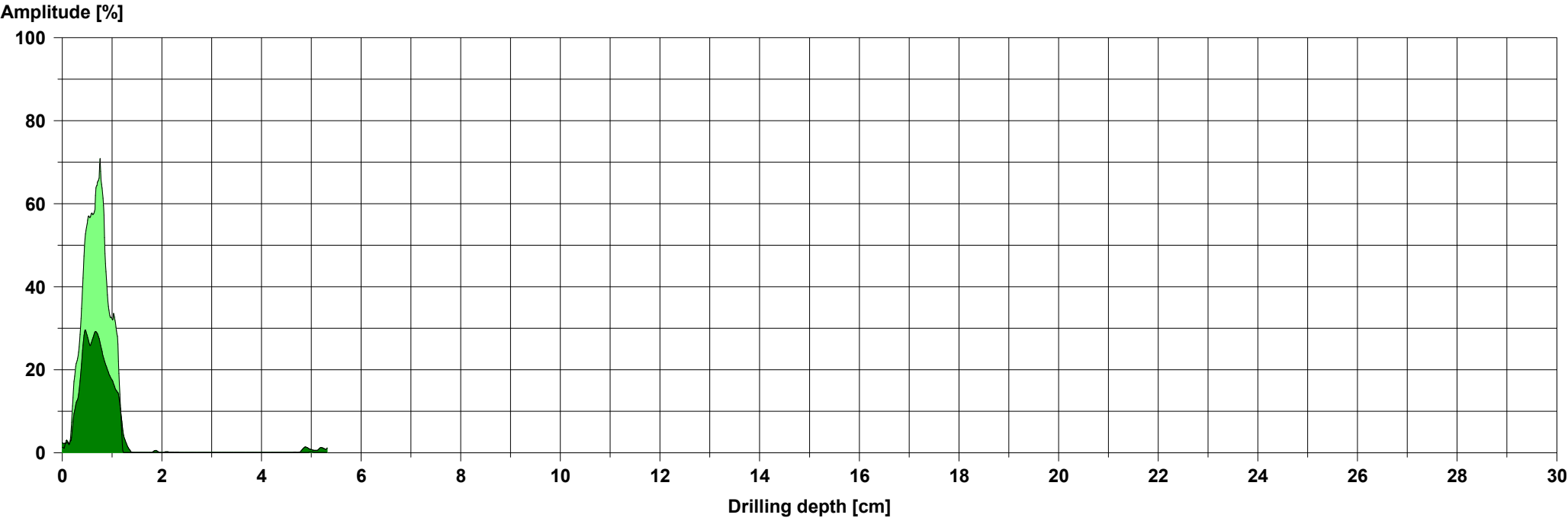
Information regarding the individual drilling points is presented on the graphs which are included at the end of the report – either as comments (bottom right) or in the status panel (top left) which shows details such as feed speed and orientation of the drill – shown as 'Tilt' and measured in degrees from horizontal (a drilling straight down from above would be indicated by -90°, straight up would be indicated by +90°, straight in horizontally would show as a tilt of 0°).

Those graphs – generally the first 1 or 2, described in the comments as 'calibration' are important, as they represent a trace through timber known to be sound – and as such form a baseline for interpretation of subsequent graphs.

Close centred peaks and troughs in the graph represent the early wood late wood boundaries (growth rings) – with early rapid spring growth resulting in softer material, producing a trough, and the later summer growth being slower, producing a narrower and denser growth phase marked by a peak in the graph.

Measuring / object data

Measurement no.:	1	Speed	: 2500 r/min	Diameter:	
ID number	:	Needle state:	---	Level	:
Drilling depth	: 5,32 cm	Tilt	: +5°	Direction:	
Date	: 27.06.2024	Offset	: 75 / 268	Species	:
Time	: 12:29:38	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

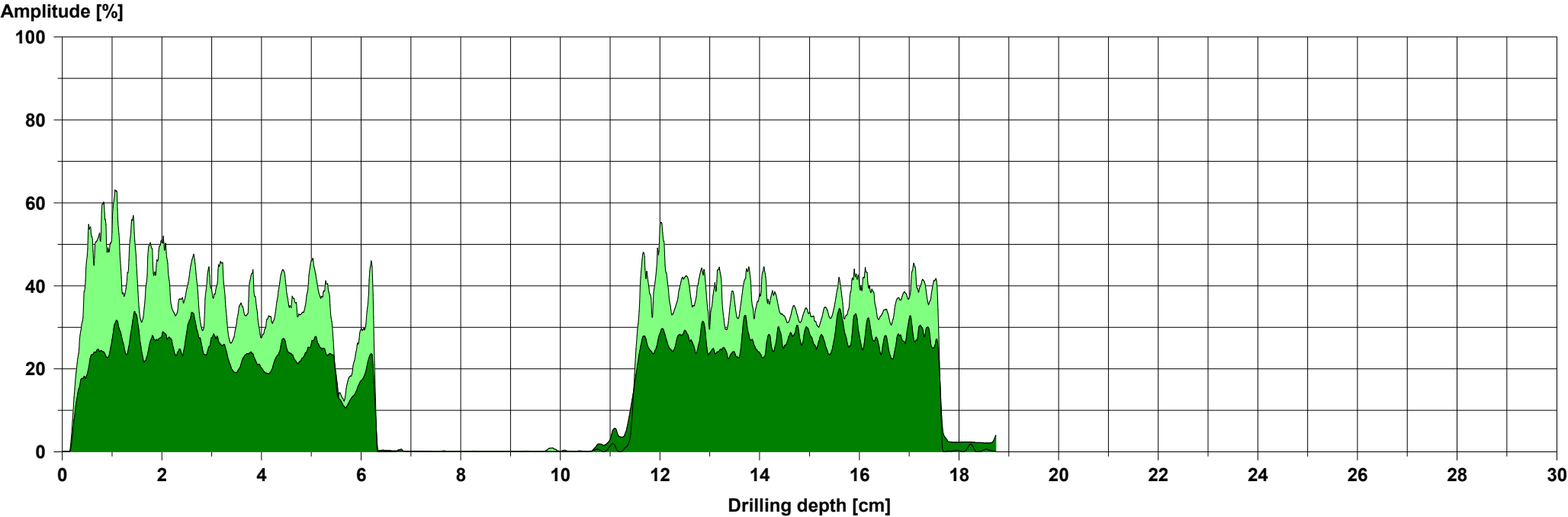


Assessment

Comment

Measuring / object data

Measurement no.:	2	Speed	: 2500 r/min	Diameter:	
ID number	:	Needle state:	---	Level	:
Drilling depth	: 18,74 cm	Tilt	: 0°	Direction:	
Date	: 27.06.2024	Offset	: 67 / 260	Species	:
Time	: 12:29:54	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

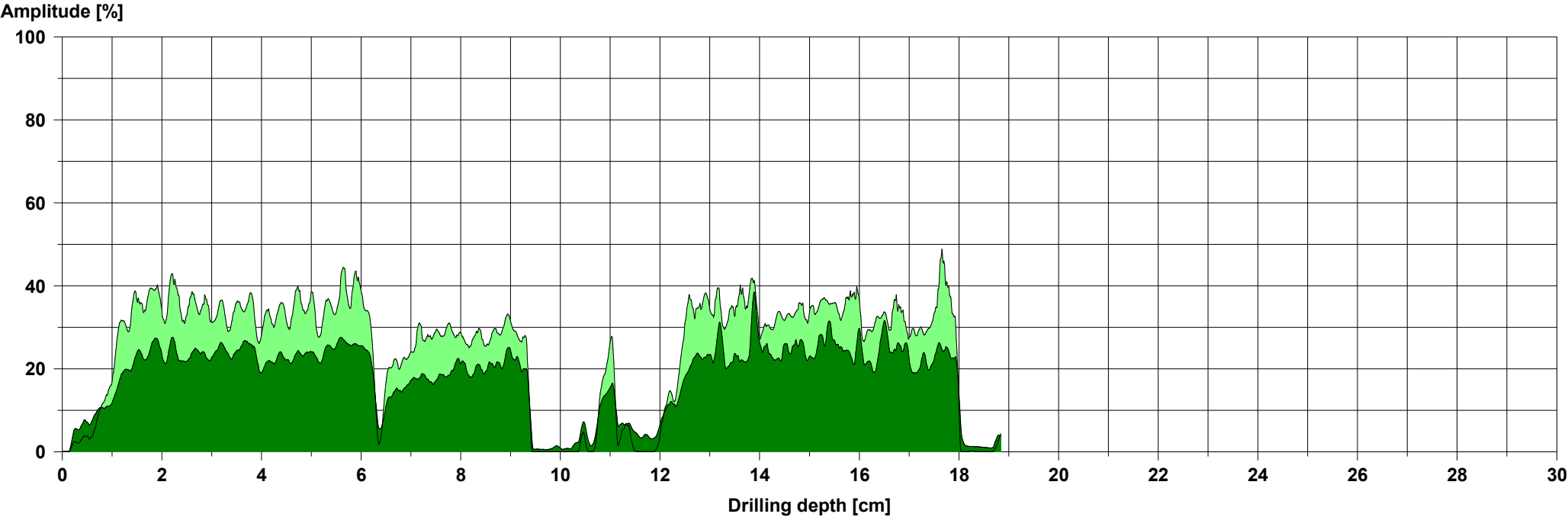


Assessment

Comment

Measuring / object data

Measurement no.:	3	Speed	: 2500 r/min	Diameter:	
ID number	:	Needle state:	---	Level	:
Drilling depth	: 18,84 cm	Tilt	: 0°	Direction:	
Date	: 27.06.2024	Offset	: 72 / 253	Species	:
Time	: 12:30:57	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

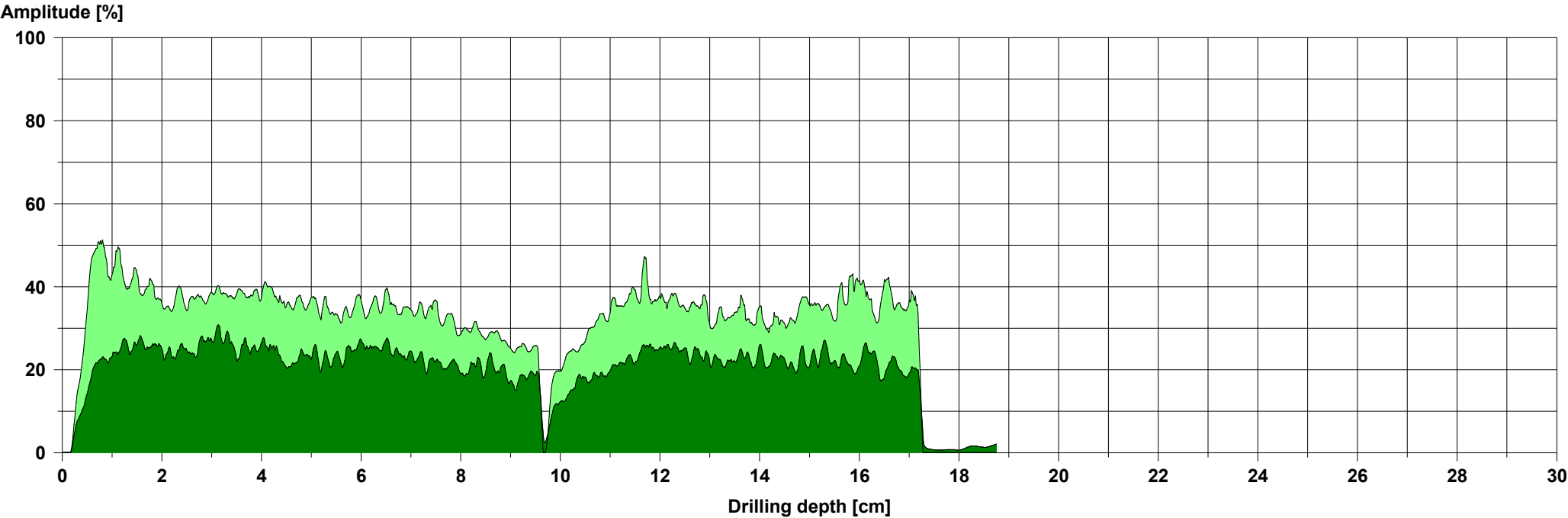


Assessment

Comment

Measuring / object data

Measurement no.:	4	Speed	: 2500 r/min	Diameter:	
ID number	:	Needle state:	---	Level	:
Drilling depth	: 18,75 cm	Tilt	: +2°	Direction:	
Date	: 27.06.2024	Offset	: 66 / 256	Species	:
Time	: 12:32:45	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

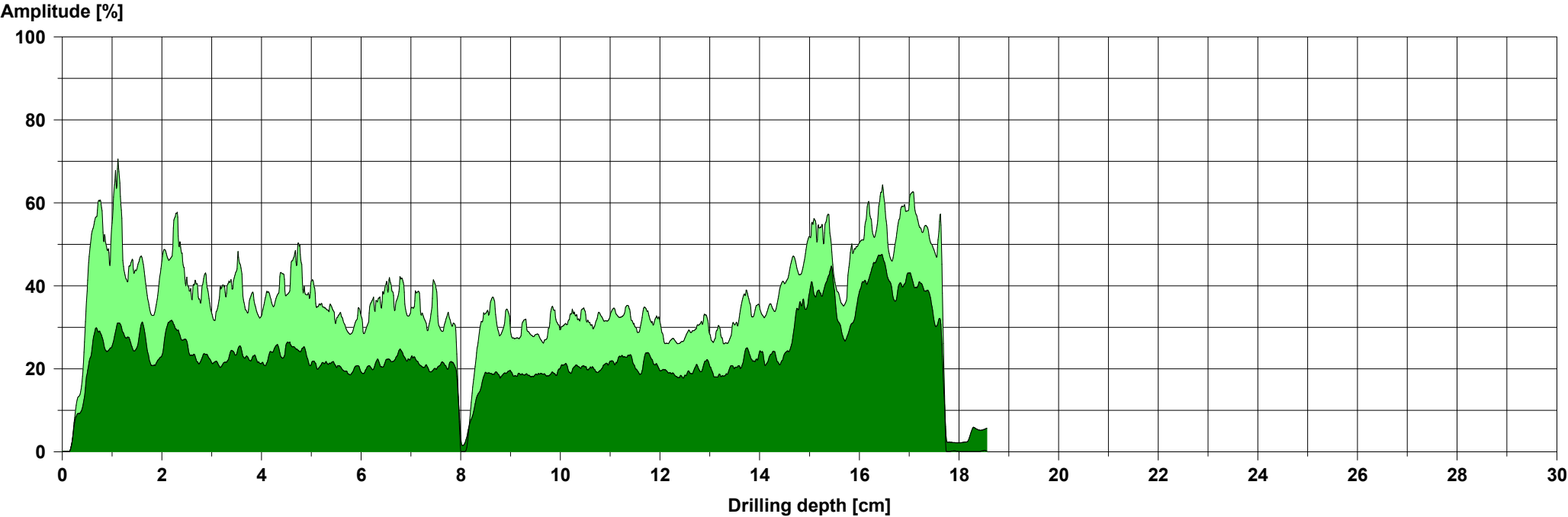


Assessment

Comment

Measuring / object data

Measurement no.:	5	Speed	: 2500 r/min	Diameter:	
ID number	:	Needle state:	---	Level	:
Drilling depth	: 18,56 cm	Tilt	: 0°	Direction:	
Date	: 27.06.2024	Offset	: 72 / 252	Species	:
Time	: 12:34:48	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

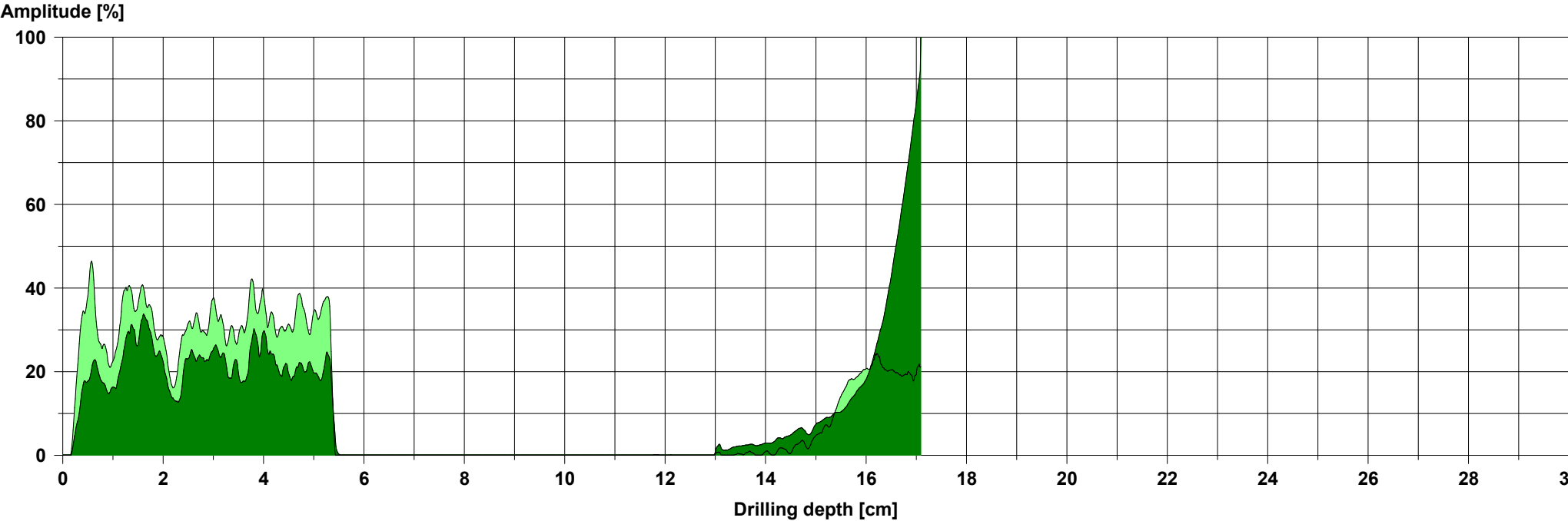


Assessment

Comment

Measuring / object data

Measurement no.:	6	Speed	: 2500 r/min	Diameter:	
ID number	: SP1	Needle state:	---	Level	:
Drilling depth	: 17,09 cm	Tilt	: -2°	Direction:	
Date	: 27.06.2024	Offset	: 69 / 255	Species	:
Time	: 13:23:42	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		



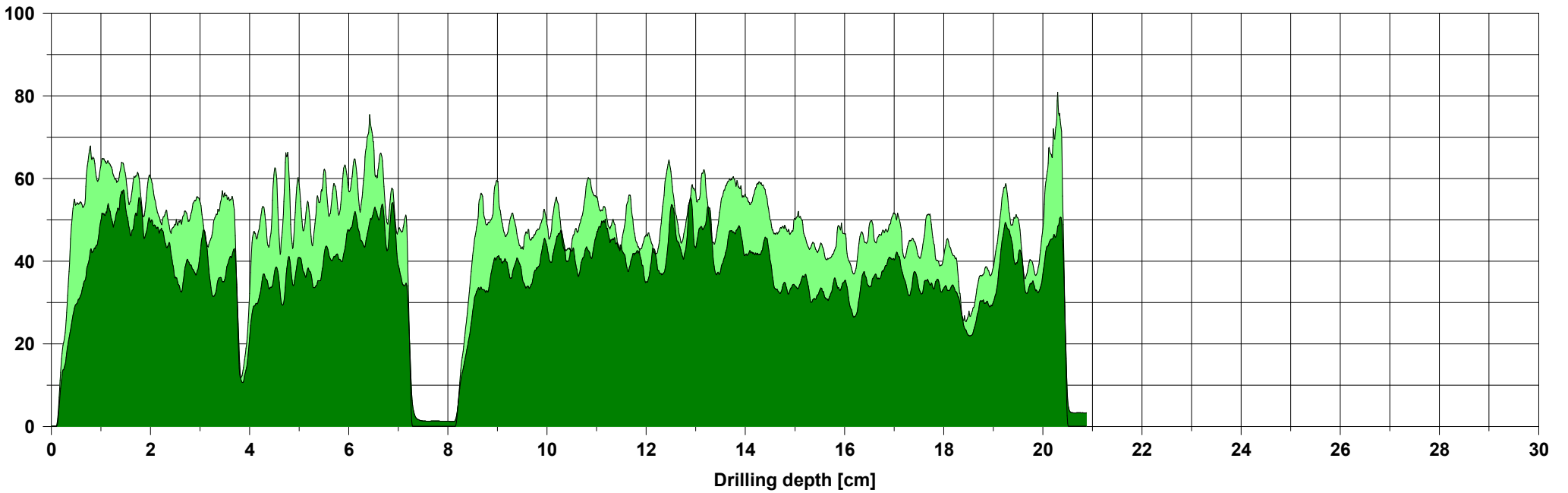
Assessment

Comment

Measuring / object data

Measurement no.:	7	Speed	: 2500 r/min	Diameter:	
ID number	: SP2	Needle state:	---	Level	:
Drilling depth	: 20,88 cm	Tilt	: -1°	Direction:	
Date	: 27.06.2024	Offset	: 79 / 274	Species	:
Time	: 13:51:26	Avg. curve	: off / off	Location	:
Feed	: 100 cm/min	Name	:		

Amplitude [%]

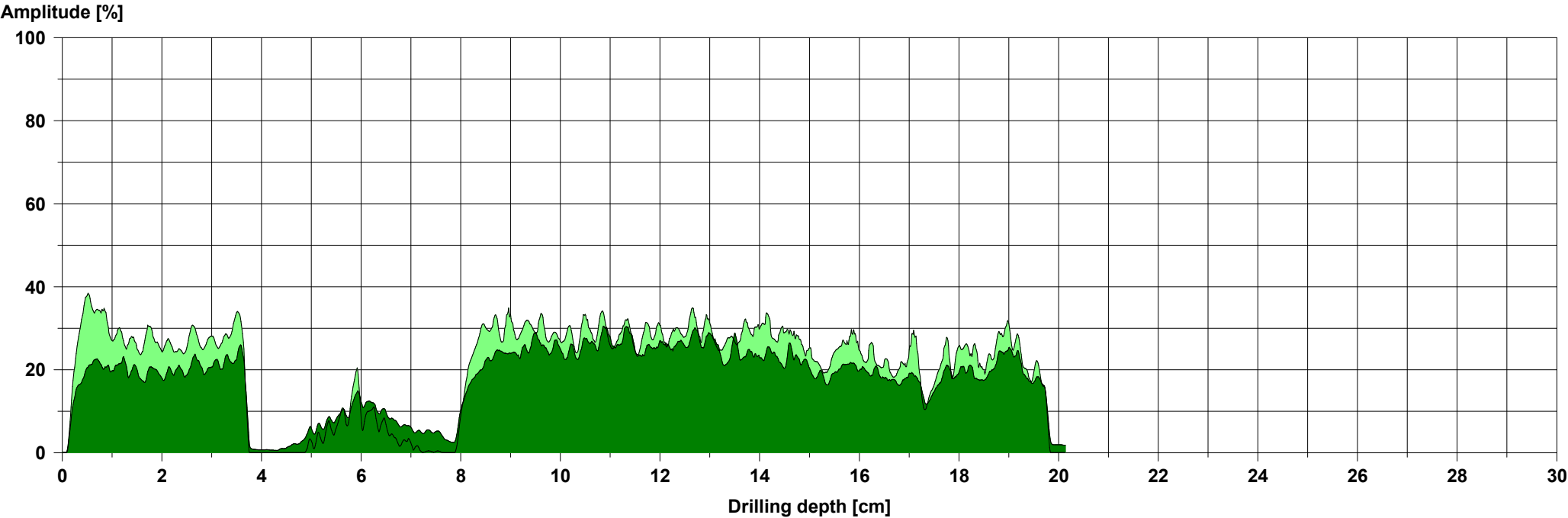


Assessment

Comment

Measuring / object data

Measurement no.:	8	Speed	: 2500 r/min	Diameter:	
ID number	: SP3	Needle state:	---	Level	:
Drilling depth	: 20,14 cm	Tilt	: -4°	Direction:	
Date	: 27.06.2024	Offset	: 63 / 269	Species	:
Time	: 13:53:01	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

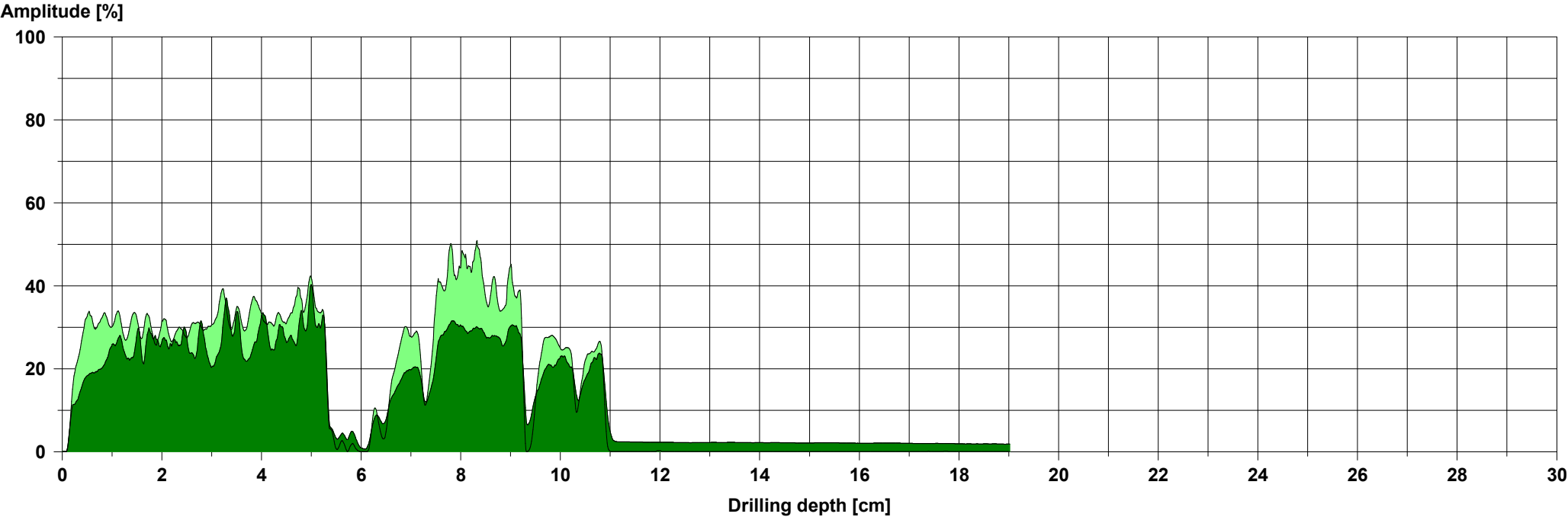


Assessment

Comment

Measuring / object data

Measurement no.:	9	Speed	: 2500 r/min	Diameter:	
ID number	: SP4	Needle state:	---	Level	:
Drilling depth	: 19,02 cm	Tilt	: -7°	Direction:	
Date	: 27.06.2024	Offset	: 63 / 263	Species	:
Time	: 13:53:46	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		



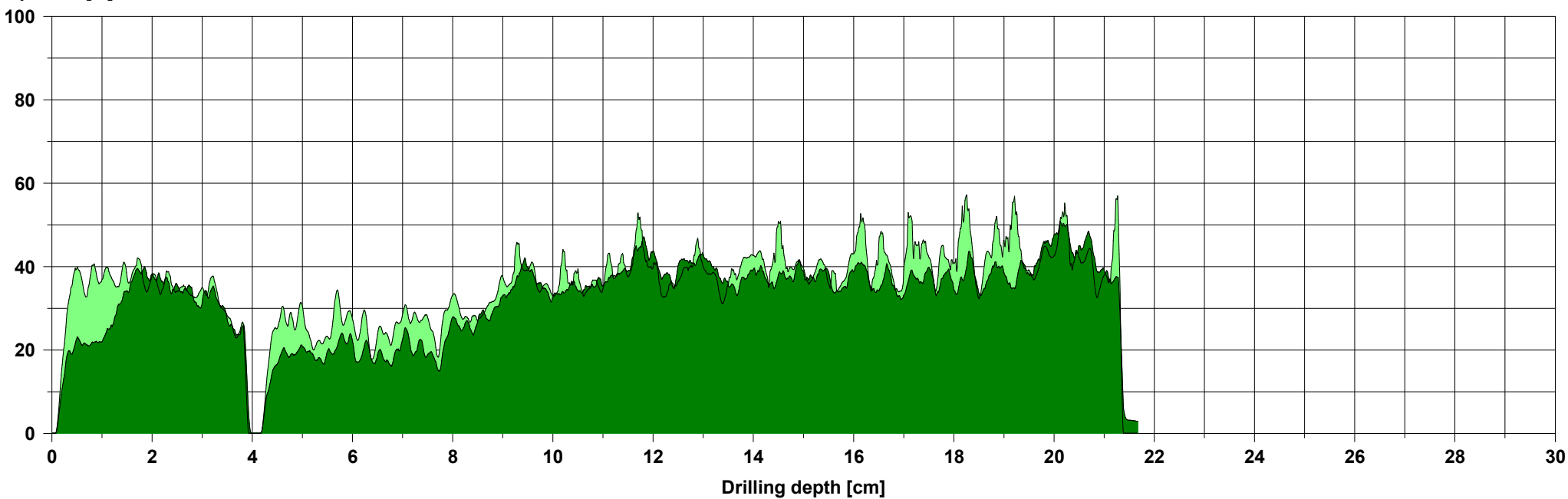
Assessment

Comment

Measuring / object data

Measurement no.:	10	Speed	: 2500 r/min	Diameter:	
ID number	: SP5	Needle state:	---	Level	:
Drilling depth	: 21,67 cm	Tilt	: -5°	Direction:	
Date	: 27.06.2024	Offset	: 64 / 270	Species	:
Time	: 13:54:34	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

Amplitude [%]

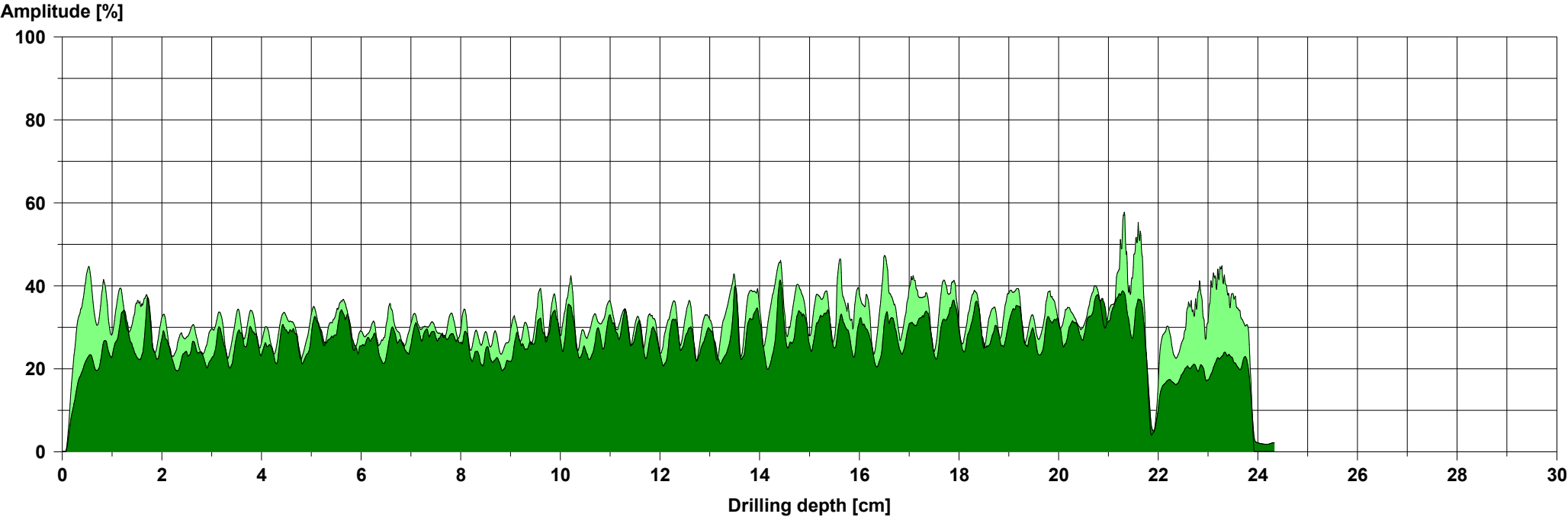


Assessment

Comment

Measuring / object data

Measurement no.:	11	Speed	: 2500 r/min	Diameter:	
ID number	: SP5I	Needle state:	---	Level	:
Drilling depth	: 24,33 cm	Tilt	: -3°	Direction:	
Date	: 27.06.2024	Offset	: 62 / 268	Species	:
Time	: 13:55:37	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

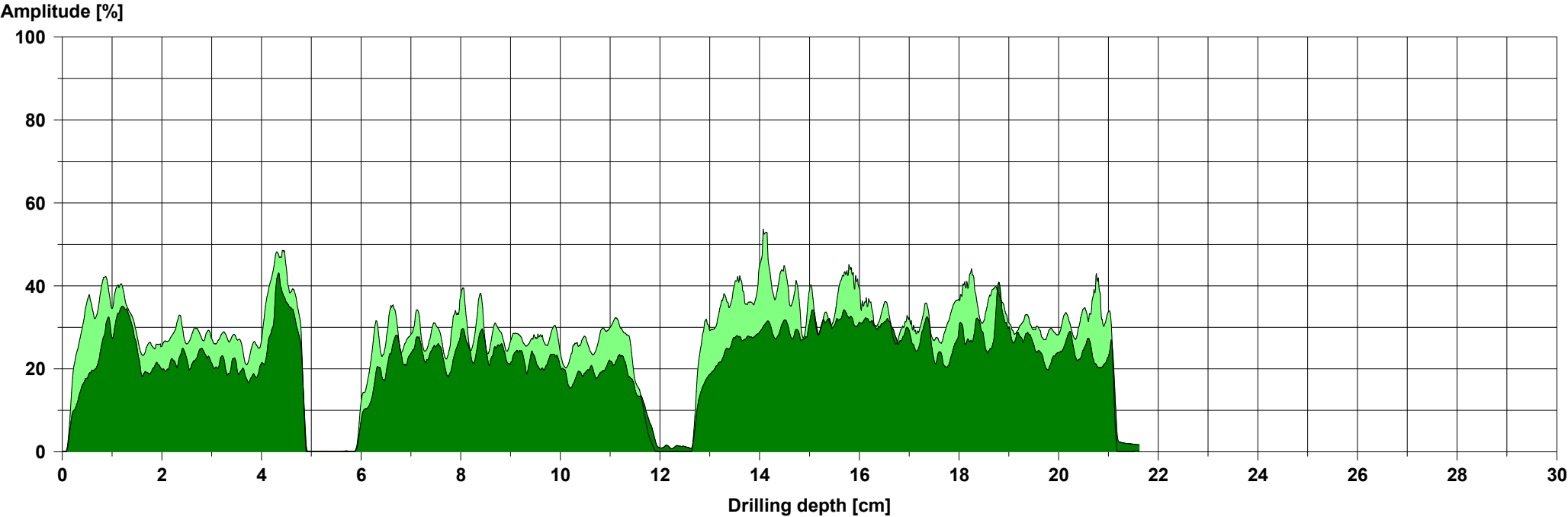


Assessment

Comment

Measuring / object data

Measurement no.:	12	Speed	: 2500 r/min	Diameter:	
ID number	: SP6	Needle state:	---	Level	:
Drilling depth	: 21,62 cm	Tilt	: -6°	Direction:	
Date	: 27.06.2024	Offset	: 60 / 266	Species	:
Time	: 13:56:26	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		



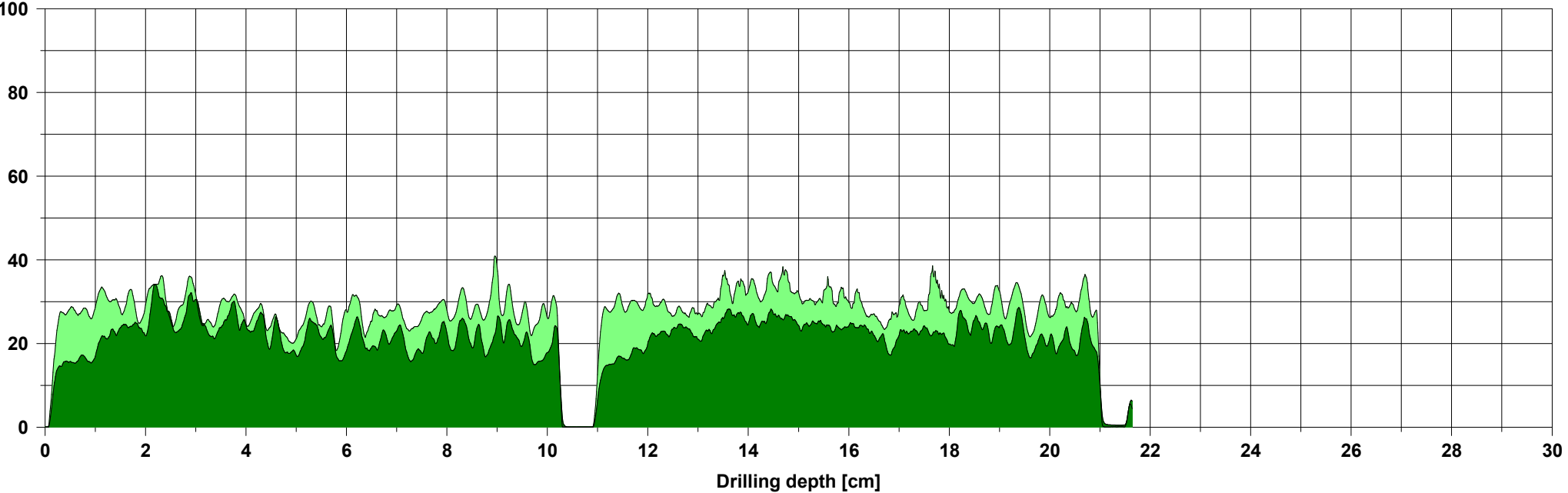
Assessment

Comment

Measuring / object data

Measurement no.:	13	Speed	: 2500 r/min	Diameter:	
ID number	: SP7	Needle state:	---	Level	:
Drilling depth	: 21,64 cm	Tilt	: 0°	Direction:	
Date	: 27.06.2024	Offset	: 60 / 266	Species	:
Time	: 13:57:11	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min			Name	:

Amplitude [%]

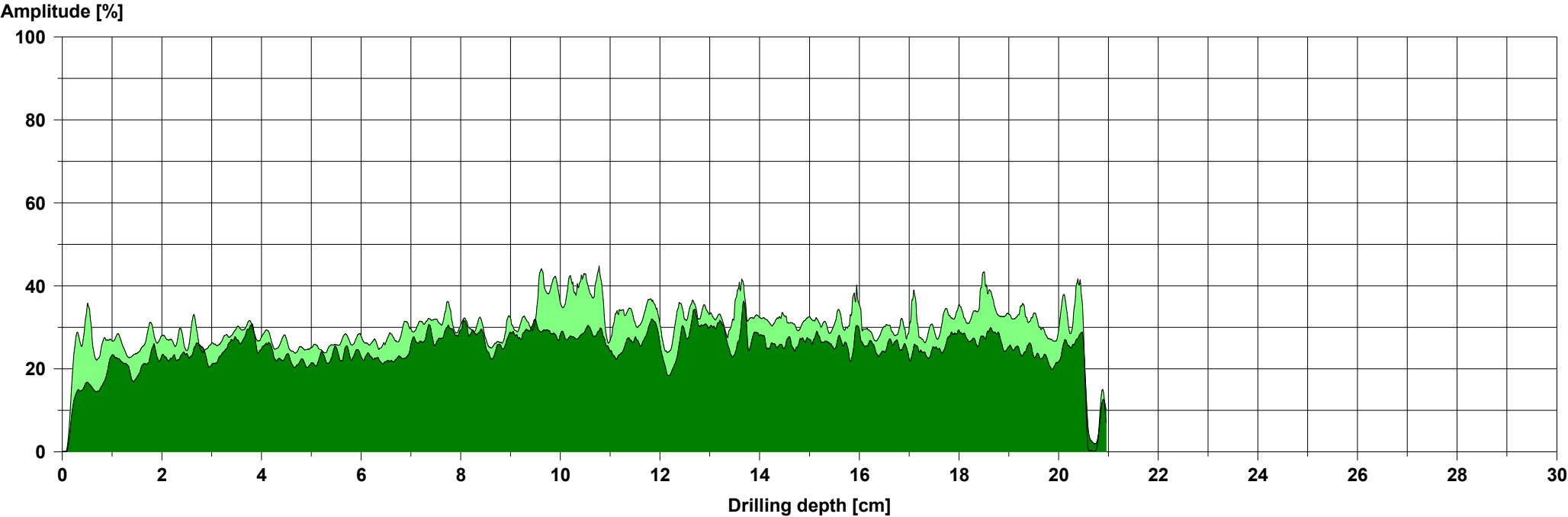


Assessment

Comment

Measuring / object data

Measurement no.:	14	Speed	: 2500 r/min	Diameter:	
ID number	: SP7I	Needle state:	---	Level	:
Drilling depth	: 20,95 cm	Tilt	: 0°	Direction:	
Date	: 27.06.2024	Offset	: 59 / 269	Species	:
Time	: 13:57:57	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		



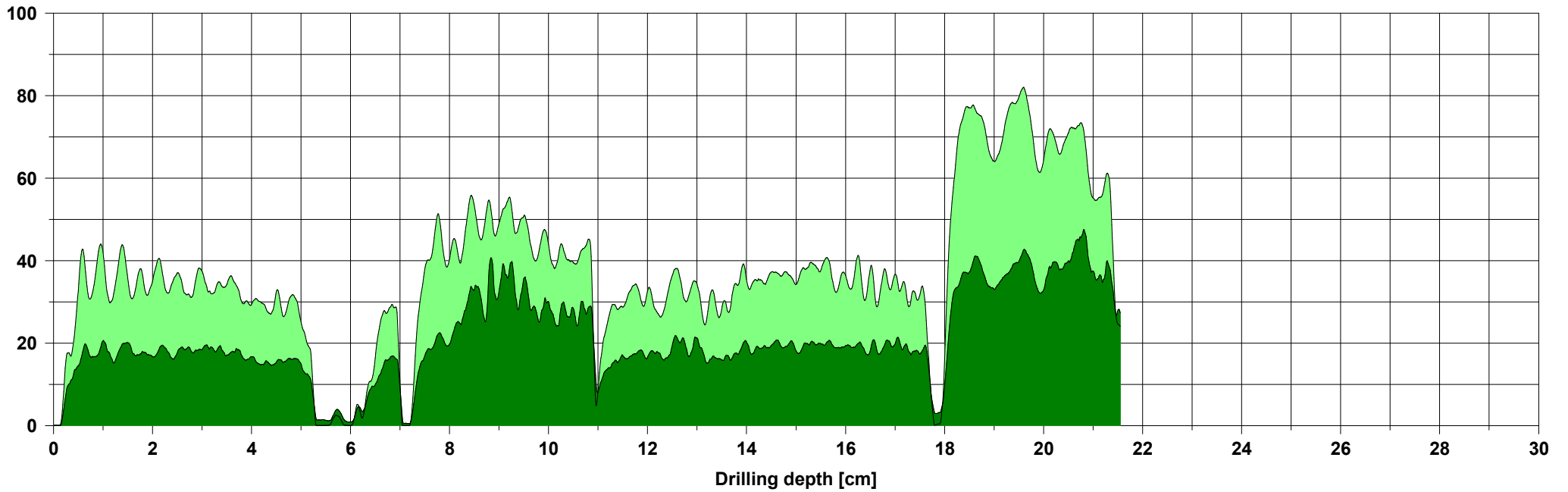
Assessment

Comment

Measuring / object data

Measurement no.:	15	Speed	: 2500 r/min	Diameter:	
ID number	: SP12	Needle state:	---	Level	:
Drilling depth	: 21,55 cm	Tilt	: -6°	Direction:	
Date	: 27.06.2024	Offset	: 56 / 265	Species	:
Time	: 14:01:33	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

Amplitude [%]

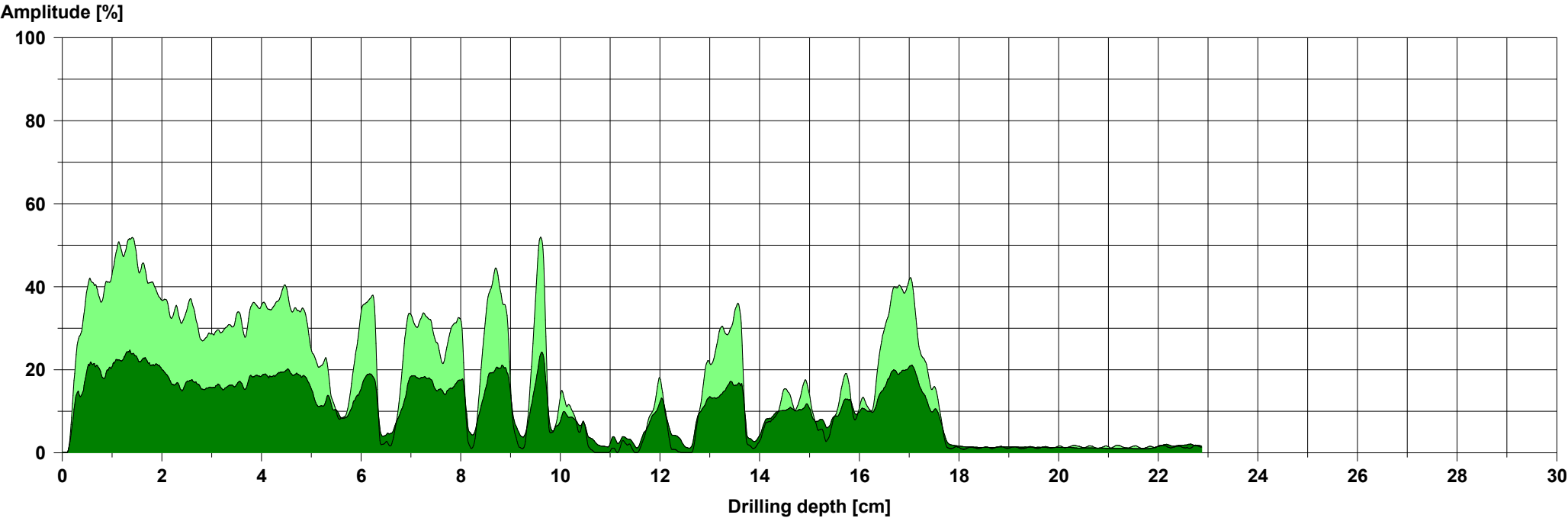


Assessment

Comment

Measuring / object data

Measurement no.:	16	Speed	: 2500 r/min	Diameter:	
ID number	: SP12I	Needle state:	---	Level	:
Drilling depth	: 22,87 cm	Tilt	: -7°	Direction:	
Date	: 27.06.2024	Offset	: 58 / 264	Species	:
Time	: 14:02:23	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min			Name	:

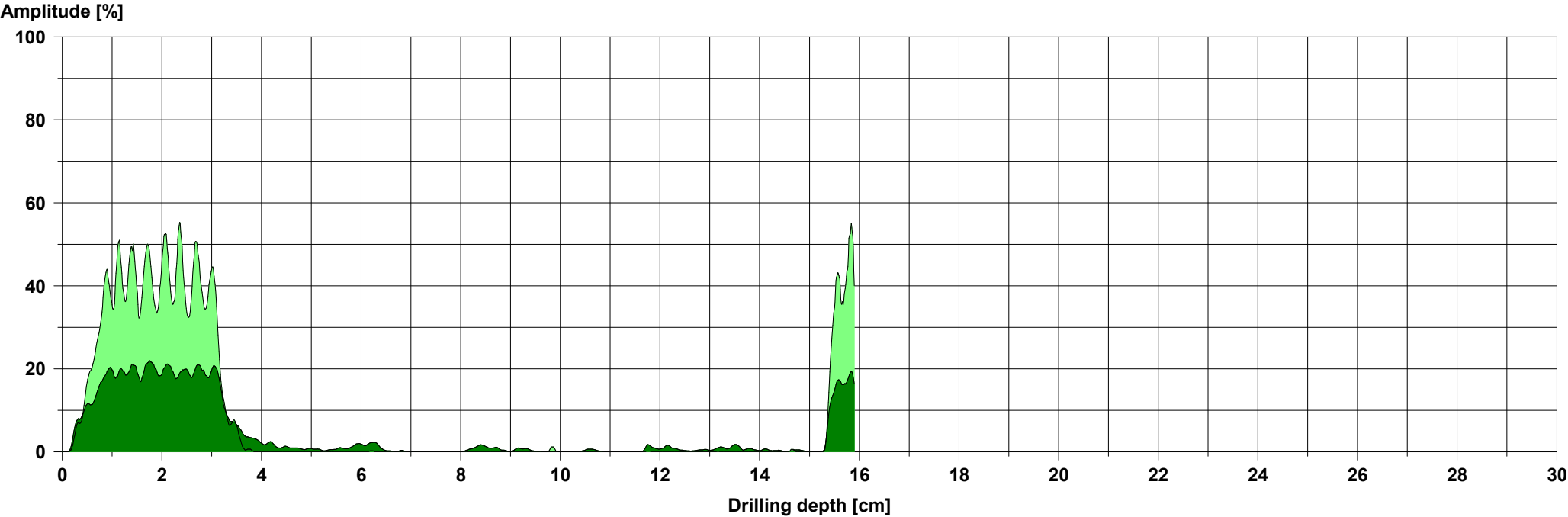


Assessment

Comment

Measuring / object data

Measurement no.:	17	Speed	: 2500 r/min	Diameter:	
ID number	: SP13	Needle state:	---	Level	:
Drilling depth	: 15,90 cm	Tilt	: -14°	Direction:	
Date	: 27.06.2024	Offset	: 59 / 258	Species	:
Time	: 14:04:07	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

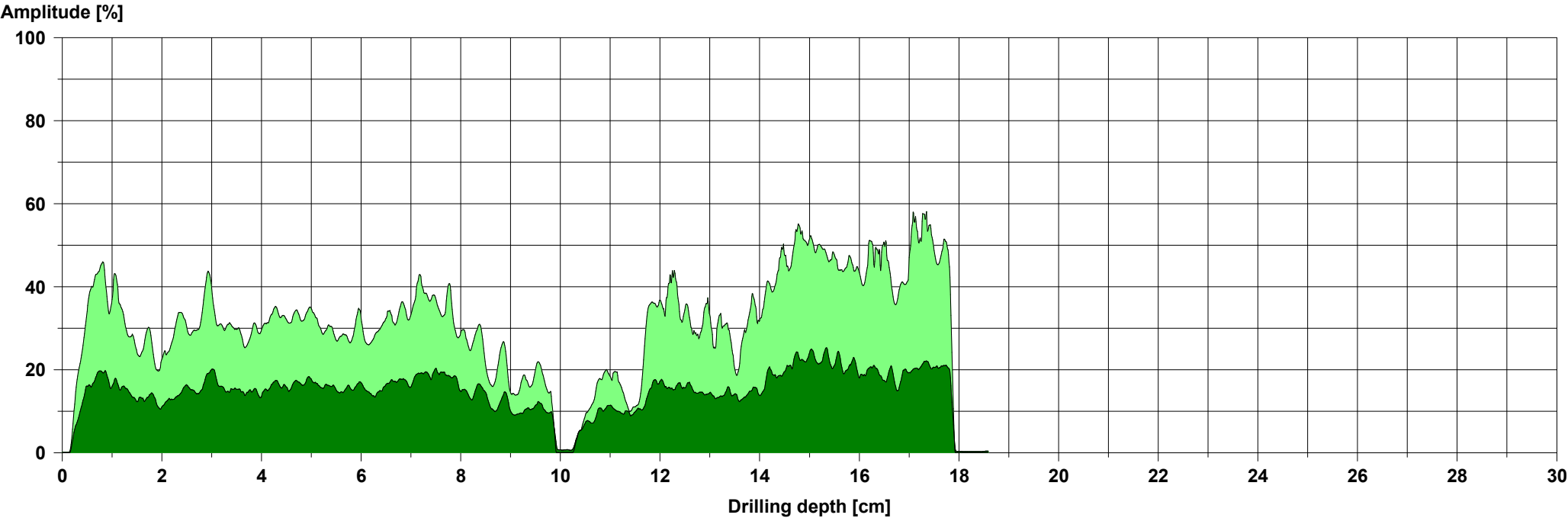


Assessment

Comment

Measuring / object data

Measurement no.:	18	Speed	: 2500 r/min	Diameter:	
ID number	: SP13I	Needle state:	---	Level	:
Drilling depth	: 18,59 cm	Tilt	: -1°	Direction:	
Date	: 27.06.2024	Offset	: 62 / 252	Species	:
Time	: 14:05:28	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min			Name	:

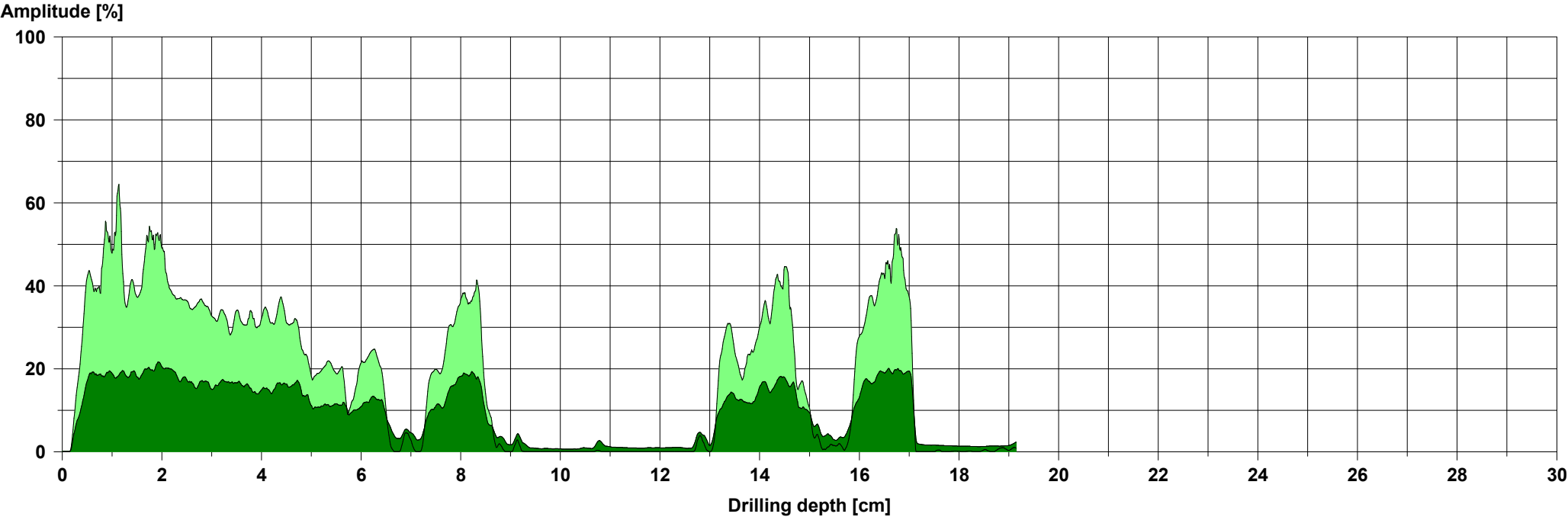


Assessment

Comment

Measuring / object data

Measurement no.:	19	Speed	: 2500 r/min	Diameter:	
ID number	: SP12.5	Needle state:	---	Level	:
Drilling depth	: 19,15 cm	Tilt	: +1°	Direction:	
Date	: 27.06.2024	Offset	: 62 / 257	Species	:
Time	: 14:06:29	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

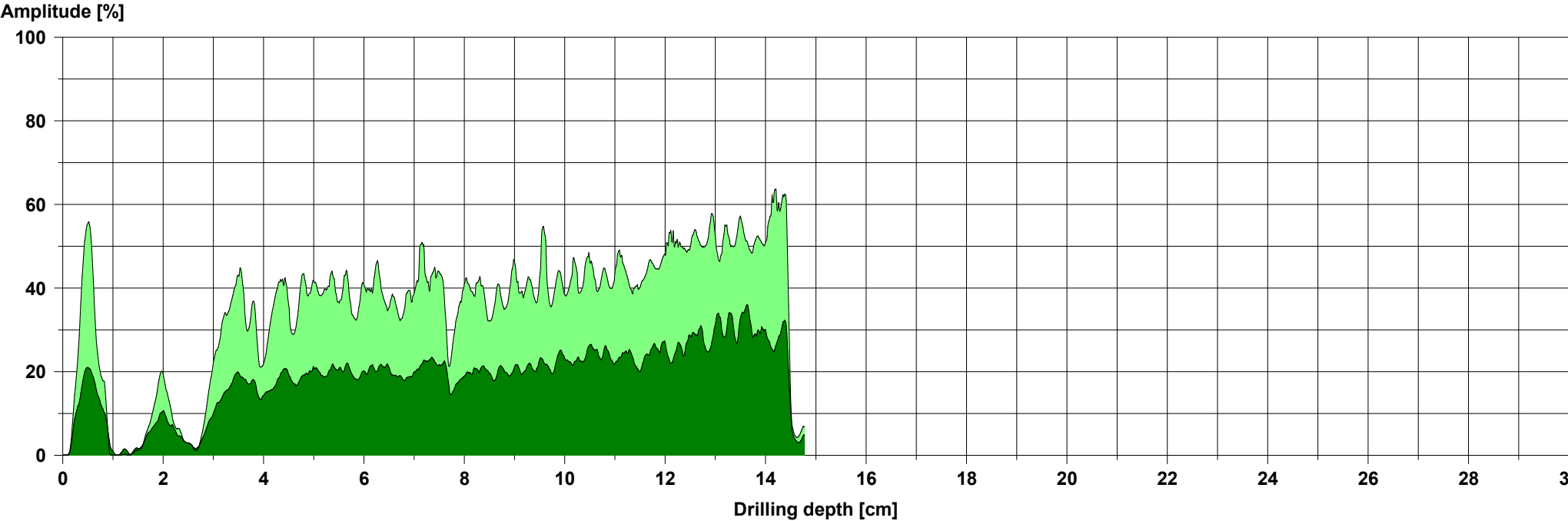


Assessment

Comment

Measuring / object data

Measurement no.:	20	Speed	: 2500 r/min	Diameter:	
ID number	: CP14	Needle state:	---	Level	:
Drilling depth	: 14,77 cm	Tilt	: +1°	Direction:	
Date	: 27.06.2024	Offset	: 57 / 254	Species	:
Time	: 14:08:11	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

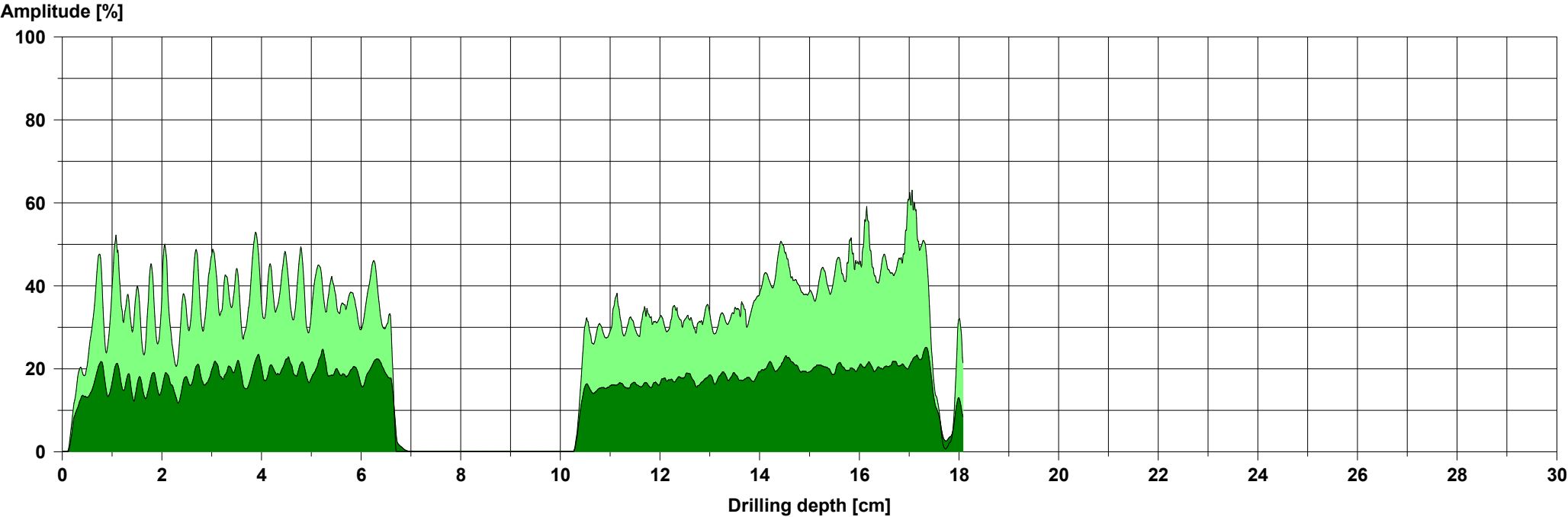


Assessment

Comment

Measuring / object data

Measurement no.:	21	Speed	: 2500 r/min	Diameter:	
ID number	: SP14	Needle state:	---	Level	:
Drilling depth	: 18,08 cm	Tilt	: -9°	Direction:	
Date	: 27.06.2024	Offset	: 57 / 255	Species	:
Time	: 14:08:53	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min	Name	:		

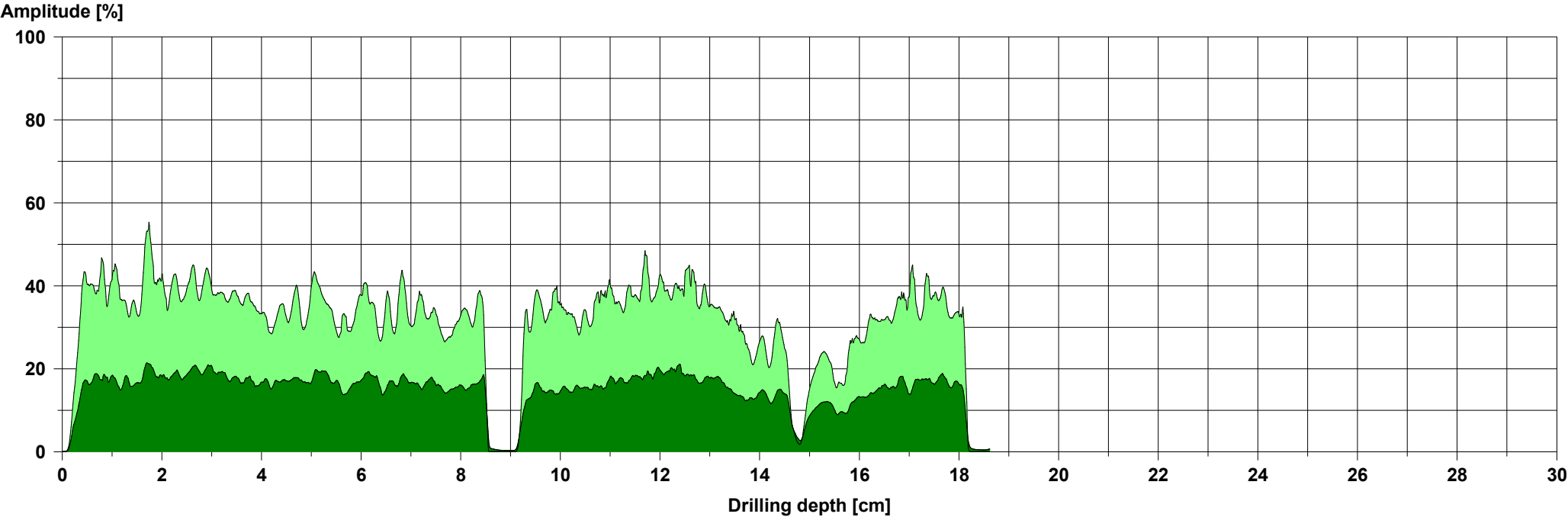


Assessment

Comment

Measuring / object data

Measurement no.:	22	Speed	: 2500 r/min	Diameter:	
ID number	: SP14I	Needle state:	---	Level	:
Drilling depth	: 18,62 cm	Tilt	: +5°	Direction:	
Date	: 27.06.2024	Offset	: 61 / 252	Species	:
Time	: 14:09:38	Avg. curve	: off / off	Location	:
Feed	: 50 cm/min			Name	:



Assessment

Comment