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Sampling for wood decay analyses of cable car trestles and houses at Svalbard

Field report

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Sampling for wood decay analyses of cable car trestles and houses at Svalbard. Field report

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SAMMENDRAG/SUMMARY:

Denne rapporten er dokumentasjon av datainnsamling og prøvetaking i felt på Svalbard i 2022 i prosjektet *ArcticAlpineDecay*. Målet med prosjektet og metodene er beskrevet. Deretter er hvert objekt som ble undersøkt beskrevet, inkl. lokalitet, Askeladden ID, kartkoordinat, fotodokumentasjon og illustrasjon av prøvetaking. Sammenstilling av resultatene vil bli publisert i vitenskapelige publikasjoner samt i en sluttrapport fra prosjektet.

This report is a documentation of the field data collection and sampling at Svalbard in 2022 within the project *ArcticAlpineDecay*. The sampling methods are described and for each object sampling was performed documentation is provided, incl. location, Askeladden ID, map coordinate, photo documentation and illustration of sampling. Compilation of the results from the project will be published in peer review journals and in a final report from the project.

LAND/COUNTRY:	Norge
FYLKE/COUNTY:	Viken
KOMMUNE/MUNICIPALITY:	Ås

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PROSJEKTLEDER / PROJECT LEADER



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Preface

The project “Deterioration and decay of wooden cultural heritage in Arctic and Alpine environments” (*ArcticAlpineDecay*) is funded by The Research Council of Norway (RCN project no. 320507). The project duration is November 2021 to October 2025. The partners in the project are: Norwegian institute of Bioeconomy Research (NIBIO), Norwegian Institute for Cultural Heritage Research (NIKU), Mycoteam, The Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation KADK), Directorate of cultural heritage (Riksantikvaren), Kings Bay, Store Norske Spitsbergen Kulkompani (SNSK), The Norwegian Trekking Association (Den Norske turistforening, DNT) and Vestland Fylkeskommune. Sysselmasteren (The Governor of Svalbard) is informed about the activities in the project. *ArcticAlpineDecay* are cooperating with two other RCN funded projects; Polar Climate and Cultural Heritage – Preservation and Restoration Management (PCCH-Arctic) and Cultural Heritage Sites in Coastal Areas (CULTCOAST).

The aim of this report is to document the data collection and sampling from field work at Svalbard July 25 to August 2, 2022. The results from the project will be published in peer review papers and a summary report will be published at the end of the project.

Ås, 31.01.2023

Gry Alfredsen

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1 Background

Our wooden cultural heritage in the Arctic Svalbard and the Alpine regions of mainland Norway is situated in vulnerable ecosystems with high impact from the ongoing climate changes in addition to threats from increased human influence and land use changes. The UN Sustainable Development Goals highlights the importance of strengthening the efforts to protect and safeguard the world's cultural and natural heritage. The main objective of *ArcticAlpineDecay* is to mitigate negative consequences of these threats.

We know that climate change will increase the fungal decay rate of wood in service and in cultural heritage in Arctic and Alpine regions. We further hypothesise that human influence and land use changes will further accelerate the deterioration. *ArcticAlpineDecay* will increase the resilience of wooden cultural heritage through cross-disciplinary cooperation and basic research involving stakeholders, public authorities, tourist trade, commerce, cultural-historical science, wood science and societal science.

Primary objective of *ArcticAlpineDecay*: Mitigate negative consequences of climate change and human impact on wooden cultural heritage in Arctic and Alpine regions in Norway.

Secondary objectives:

ArcticAlpineDecay will increase the resilience of wooden cultural heritage through cross-disciplinary cooperation and research between governmental institutions, tourist trade, commerce and science by:

- 1) Identify and quantify the wood characteristics and decay rate resulting from fungal deterioration of wood and include the data in an open access database.
- 2) Identify the impact of user, tourist and guide behaviour and perception regarding wooden cultural heritage.
- 3) Provide future deterioration scenarios and risk assessment analysis for typologies of wooden cultural heritage.
- 4) Assemble a web knowledge platform based on secondary objectives 1-3. The platform shall facilitate future practical, sustainable, and fitting management strategies to ensure the resilience of wooden cultural heritage including knowledge transfer.

2 Methods

The aim was to sample cultural heritage wood in service both from soil contact and above ground to compare the effect of exposure. The focus was on cable car trestles because similar structures provide replicates in time because the cable car lines to the different mines was constructed at different times.

The selected cable car trestles were located in Longyearbyen, Adventdalen, Endalen and Hiorthhamn. The selected buildings were in Hiorthhamn, Ny-Ålesund and London.

In this chapter the sampling methods are described, and an overview is provided of the studied wooden objects (chapter 2.2). In chapter 3 the sampling of each cultural heritage wooden object is described in detail.

All photos in this report are taken by Mari Sand Austigard except the photos from Ny-Ålesund and London (Anne-Cathrine Flyen), photo from Burmaveien (Johan Mattsson) and the cover photo (Cecilie Flyen).

2.1 Sampling

In the *ArcticAlpineDecay* project we have defined four levels of field data collection for quantification and characterisation of decay.

2.1.1 Visual evaluation

This includes visual evaluation of vegetation type, microclimate (permafrost, thawing zone, open exposure, or water trap) and soil type. In addition, a visual condition assessment of each object was performed and is included in this report.

2.1.2 Slim awl

A simple way to quantify surface decay is a pick test with a slim awl (Figure 1). The awl used in this study had a maximum diameter of 2 mm. This means that there will be no long-term visual signs of the evaluation. This method was used for cladding and windows and as a supplement to resistance drilling (2.1.3) and collection of wood samples (2.1.4) for cable car trestles ($n = 23$) and poles in soil contact under houses ($n = 3$). Maximum and minimum penetration depth of the awl was registered from the area close to resistance drilling and wood sample collection. For the cable car trestles awl measurements were done for each of the four poles both close to ground and in above ground exposure.

2.1.3 Resistance drilling

As done in previous decay studies at Svalbard, strength measurements were performed with a decay detection drill. The drill holes were approximately 2 mm in diameter, and we know from previous studies that the holes will not cause any visual damage, not affect the stability, not increase moisture uptake and not increase the risk of decay. We mainly did resistance drilling in the cable car trestles (Table 1) in addition to the foundation poles of three buildings (Table 2). The drilling was done through the pole to quantify the strength variation throughout the diameter at the selected location of the pole. We always sampled close to the ground since this area is known to have the highest risk of fungal decay. For the cable car trestles, we also did resistance drilling above ground to compare the two exposure situations.

A decay detection drill (IML-Resi PD400) measures the resistance of the material, expressed as the rotation torque of the motor (rotation resistance) and the feed resistance on the drill bit. The examination entails drilling through the wood with a bit measuring 2 mm in diameter. A graph

showing the density of the material is generated on the display of the instrument. Year increments in the wood will show as oscillations in the curve, and decayed areas will appear as declines in the graph. The data generated can be transferred to a computer for further evaluation and graphic display.

2.1.4 Wood samples

Wood samples were mainly collected from cable car trestles (Table 1) and in addition: three cultural heritage buildings, foundation poles from hotel Radisson Blu and the guardrail along Burmaveien (Table 2). The size of the wood samples was 2 x 2 x 5 cm (2 cm across the fibre direction, 2 cm depth, 5 cm in the longitudinal fibre direction). The wood samples were collected using a chisel and a hammer, a rubber mallet or a small electric saw (Figure 1). After sampling the wood sample was stored in sterile plastic bags (Figure 1). The wood samples were stored in a fridge until we were back on the mainland. Then they were placed in a freezer at -32°C until further use.



Slim awl



Resistance drill (IML-RESI PowerDrill PD400)



Chisel



Hammer (left) and rubber mallet (right)



Multi cutter (Bosch GOP 12V-28)



To secure contaminant-free samples: sterile LDPE bags with safety tabs. RNase-, DNase-, pyrogen- and BPA-free

Figure 1: Equipment used for decay evaluation.

2.2 Objects studied

Since all buildings and constructions from 1945 and older are automatically protected at Svalbard the *ArcticAlpineDecay* needed permission for sampling from the owners, the Governor of Svalbard (Sysseimesteren) and from the Directorate of cultural heritage (Riksantikvaren). The cable car trestles are currently owned by the Ministry of Trade, Industry and Fisheries (Nærings- og fiskeridepartementet, NFD) and managed by Store Norske Spitsbergen Kulkompani (SNSK). The objects are summarised in Table 1 and Table 2. According to the partial permission (dated 07.07.2022) to take samples and temporarily take them from Svalbard to the mainland for further analyses (§§ 44 and 46), “up to 10 cable car trestles could be sampled from the cable car lines from mine 5 and mine 6, ID 87889” and the selection had to be done in cooperation with SNSK. Christoffer Snaprud Christensen from SNSK assisted us with the selection of these cable car trestles. In addition to the 22 cable car trestles we had a permit to sample we were also able to do a more detailed sampling of replaced parts of a cable car trestle that had been renovated (coordinated by SNSK).

Table 1: Summary of sampled cable car trestles, their location, when the preparation for mining started (“oppfaring”), year production started in the mine, approximate age at time of sampling, Askeladden ID number, and type of sampling. All the cable car trestles are owned by NFD and currently managed by SNSK.

Location	“Oppfaring” started	Year production started	Age at time of sampling	Askeladden ID no.	Wood samples	Resistance drilling	Slim awl
In and around Longyearbyen							
Line 1a	1906	1908	116	No sampling			
Line 1b		1939		No sampling			
Line 2a	1919	1921		No sampling ¹			
Line 2b		1937 ²	85	158986-1 158986-5* 158986-6 158986-8 158986-11 158986-13 158986-17	x x x x x x x	x x x x x x x	x x x x x x x
Line 3	1969	1971 ³	51	158619-32*	x	x	x
Line 4	1954	1960		No sampling ⁴	-	-	-
Line 5/6	1957	1959 ⁵	63	878889-1 878889-14* 878889-16** 878889-17 878889-53	x x x x x	x x x x x	x x x x x
Line 5	1957	1959 ⁶	63	878889-61 878889-63* 878889-66	x x x	x x x	x x x
Line 6	1967	1969 ⁶	53	878889-79 878889-111* 878889-112*	x x x	x x x	x x x
Line 7	-	1976	46	No sampling ⁷	-	-	-
Hiorthhamn		1917	105	93041 – no. 1 from the shore 93041 - no. 2 from the shore 93041 – no. 2 from Sneheim 93041 – no. 1 from Sneheim	x x x x	x x x x	x x x x

¹Most cable car trestles in steel, now removed, ²Taubanen ble ferdig i 1937, ³Originally installed in 1936/37, but all except two are replaced more recently, ⁴Used line 1b, ⁵Cable car line finished in 1959/60, ⁶Cable car line finished in 1969, connected to the line from mine 5 from “Vinkelstasjonen”, ⁷Used line 6, now cars, *Also used in the PCCH project, ***Inspected indoors after renovation of the cable car trestle

Table 2: Summary of evaluated buildings and constructions. All cultural heritage except hotel Radisson Blu and the guardrail along Burmaveien. For all buildings the name, code provided by Sysselmasteren on local maps (see Figure 2 and 3), approximate age at time of sampling, Askeladden ID, and type of sampling.

Building	Age	Age at time of sampling	Askeladden ID	Wood samples	Resistance drilling	Slim awl
Hiorthhamn						
“Taubanestasjonen”	1938	84	93041-14	x	x	x
“Telegrafen”, Building B	1917	105	146668-2			x
“Gamlemessa”, Building E	1917	105	146668-5			x
“Direktørboligen”, Building F	1917	105	146668-6	x	x	x
“Boligbrakke” Building G	1917	105	146668-7	x	x	x
Ny-Ålesund						
“Sætra” Building 21	1919	103	159798-1			x
“Mexico” Building 26	1945	77	159882-1			x
“Museumshytta” Building 9	1918	104	159761-1			x
“Museum” Building 12	1918	104	159762-1			x
Green Harbour Building 1	1909	113	159759-1			x
London						
Camp Mansfield	1912	110	139927-1			x
Camp Lagercrantz	1912	110	139927-13			x
Longyearbyen						
Hotel Radisson Blu	1995	27	Not cultural heritage	x	x	x
Guardrail along Burmaveien	Unknown		Not cultural heritage	x		x



Figure 2: Map of buildings and ID code in Hiorthhamn. Source: Sysselmasteren (2006).

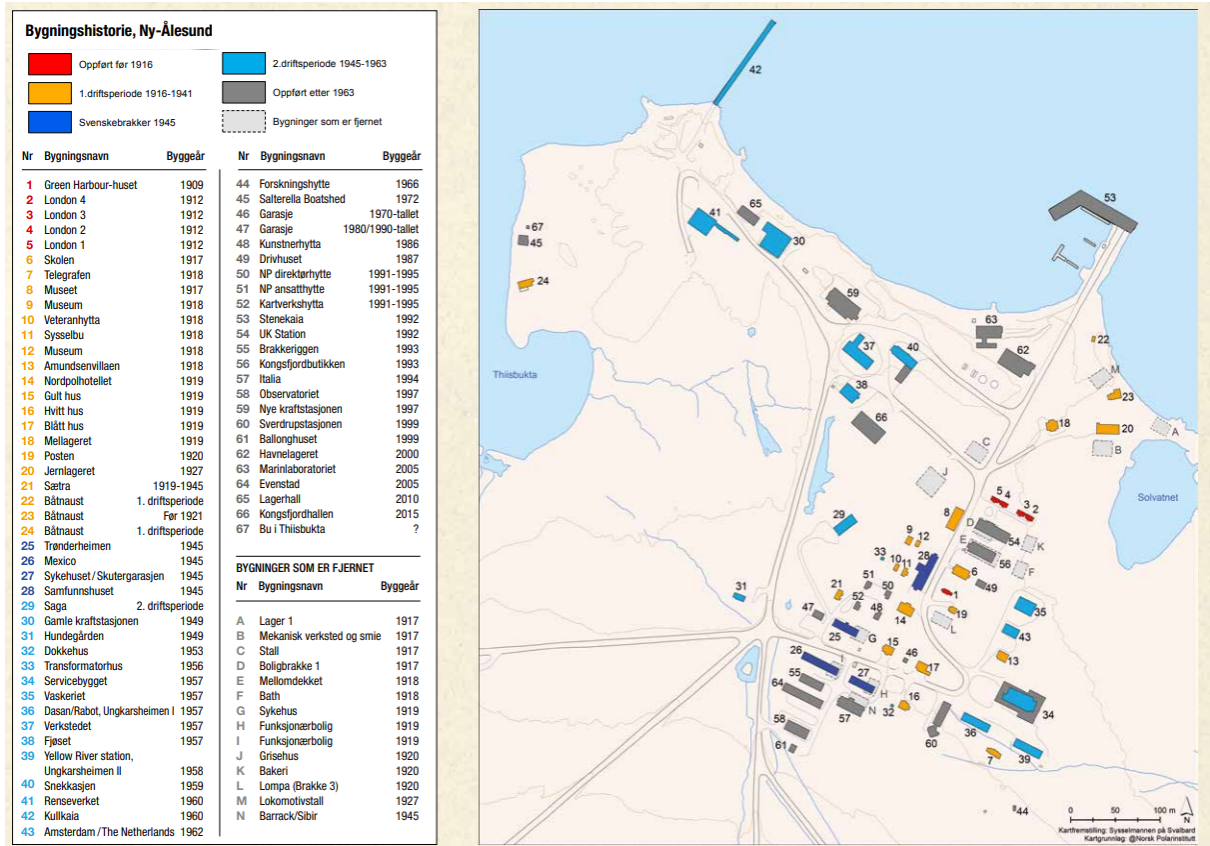


Figure 3: Map of buildings and ID code in Ny-Ålesund. Source: Sysselemesteren (2016).

3 Documentation of sampling of cable car trestles

3.1 Longyearbyen, line 2b, 158986-17

Askeladden ID	158986-17
Locality	Line 2b, cable car trestle no. 2 from «taubanestasjonen» towards mine 2b/i.e., towards south (Askeladden: trestle no. 17)
Map coordinate	EU89 UTM-sone 33, 8682932 N, 514197 E
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	26/7 2022, rev. 1/8 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



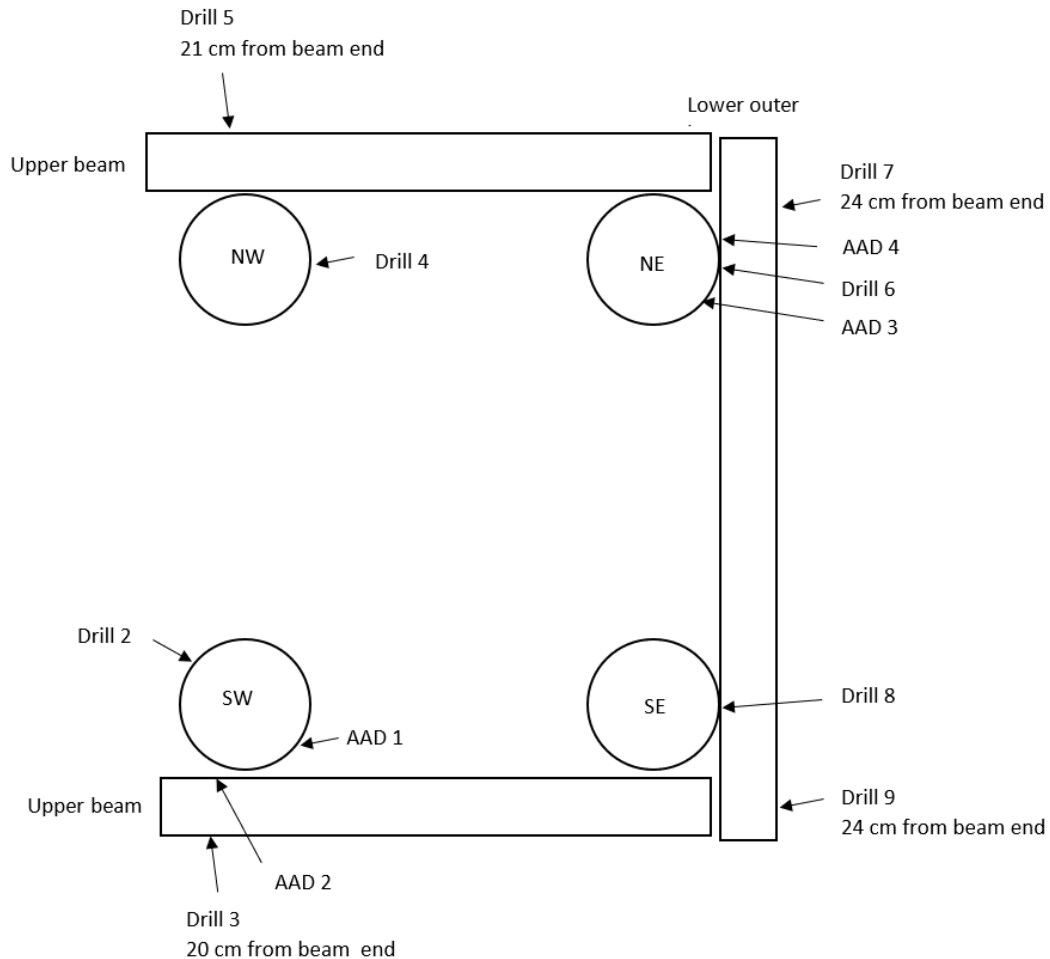
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-17

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

This cable car trestle has clear signs of fungal decay in all the foundation legs. It is low and stands away from traffic, so it does not pose a great danger to the surroundings. Nevertheless, reindeer often graze in the vicinity.

Photos before and after wood sampling



Leg SW, soil contact, before sampling



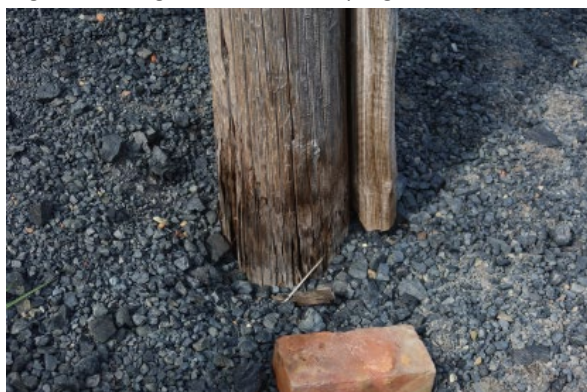
Leg SW, soil contact, after sampling



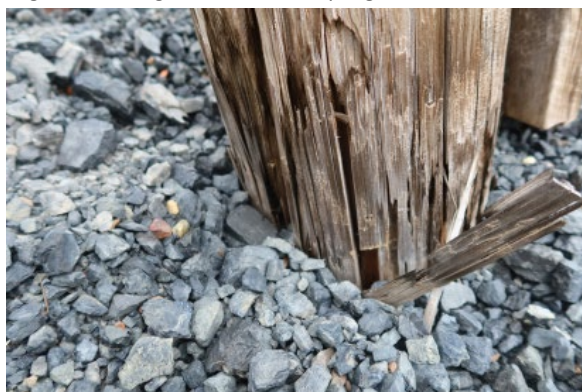
Leg SW, above ground, before sampling



Leg SW, above ground, after sampling



Leg NE, soil contact, before sampling



Leg NE, soil contact, after sampling



Leg NE, above ground, before sampling



Leg NE, above ground, after sampling

3.2 Longyearbyen, line 2b, 158986-13

Askeladden ID	158986-13
Locality	Line 2b, cable car trestle in riverbed, near southern bridge/vei 501 (Askeladden: trestle no. 13)
Map coordinate	EU89 UTM-sone 33, 8682457 N, 514130 E
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	26/7 2022, rev. 1/8 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



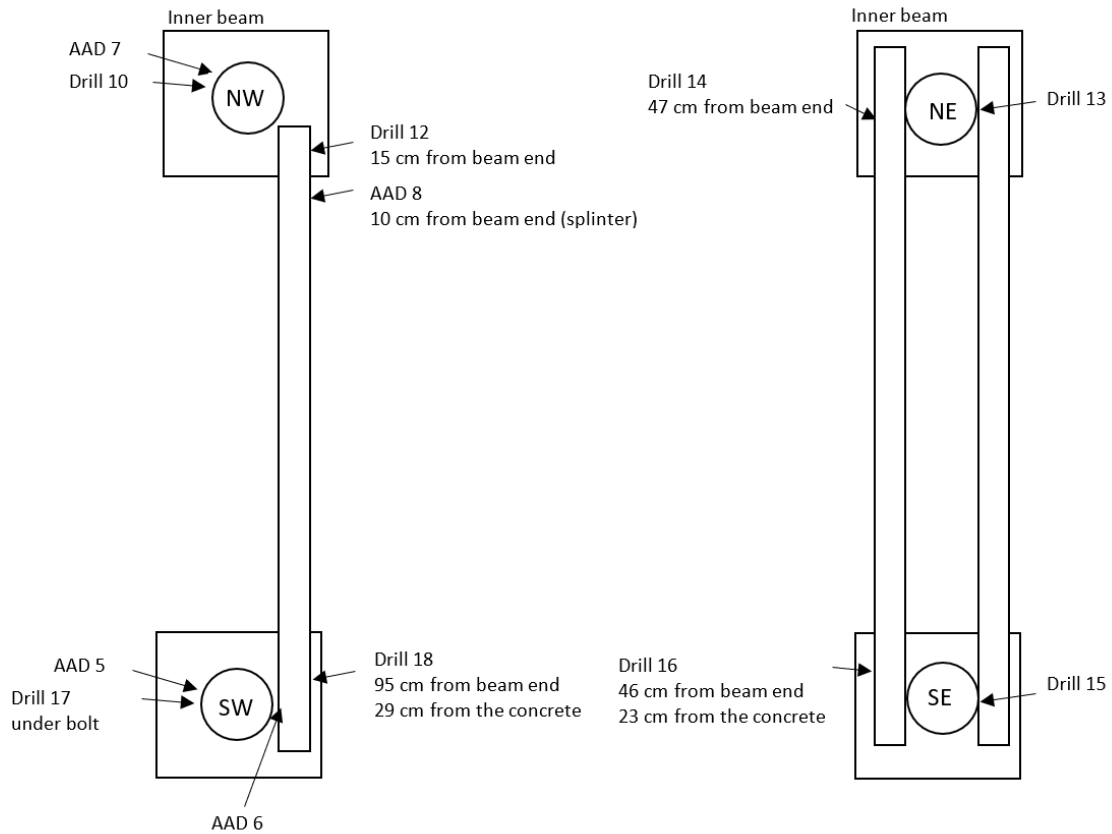
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-13

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

This cable car trestle is standing flat out in the riverbed of the Longyear river. It is tall but stands far from trafficked areas. This trestle is constructed differently from the others, which are grounded with round logs dug into the soil. These trestles, standing in the riverbed, are set on concrete foundations and is therefore less vulnerable to damage. The trestle appears to be in good condition, but the round timber that rests on the concrete foundations appears to have some water stress and they may be slightly deteriorated by fungal decay.

Photos before and after wood sampling



Leg NE, soil contact, before sampling



Leg NE, soil contact, after sampling



Leg NE, above ground, before sampling



Leg NE, above ground, after sampling



Leg SW, soil contact, before sampling



Leg SW, soil contact, after sampling



Leg SW, above ground, before sampling



Leg SW, above ground, after sampling

3.3 Longyearbyen, line 2b, 158986-11

Askeladden ID	158986-11
Locality	Line 2b, cable car trestle near kindergarten named Polarflokken (Askeladden: trestle no. 11)
Map coordinate	EU89 UTM-sone 33, 8682210 N, 514092 E
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	28/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



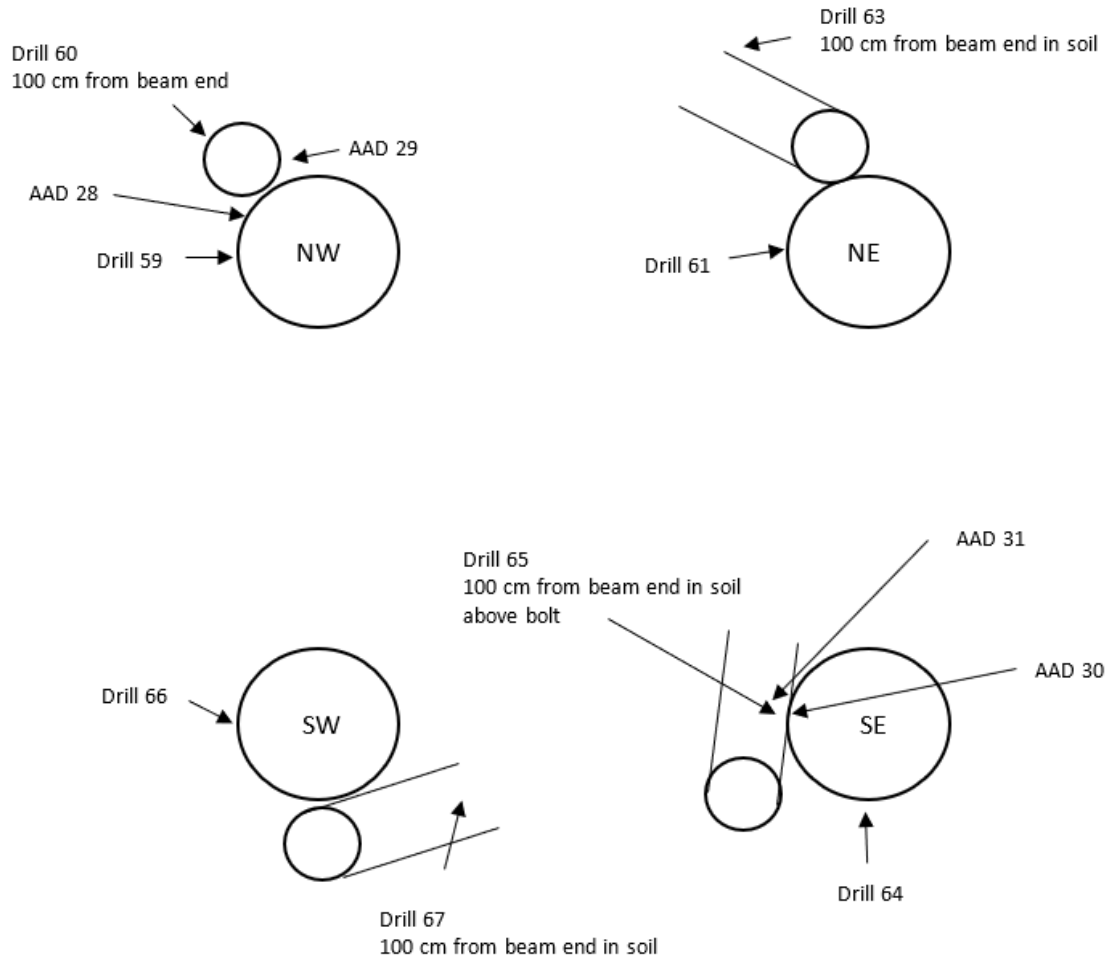
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-11

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Apparently in good condition and all structural elements in place. Fungal decay in inclined braces. The cable car trestle has not been restored and stands with original materials. Two of the foundation legs may appear to be weakened by fungal decay. The trestle is of medium height, but stands close to residential buildings, and can potentially cause major damage to the buildings.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.4 Longyearbyen, line 2b, 158986-8

Askeladden ID	158986-8
Name locality	Line 2b, cable car trestle near school (Askeladden: trestle no. 8)
Map coordinate	EU89 UTM-sone 33, 8681864 N, 514042 E
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	28/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



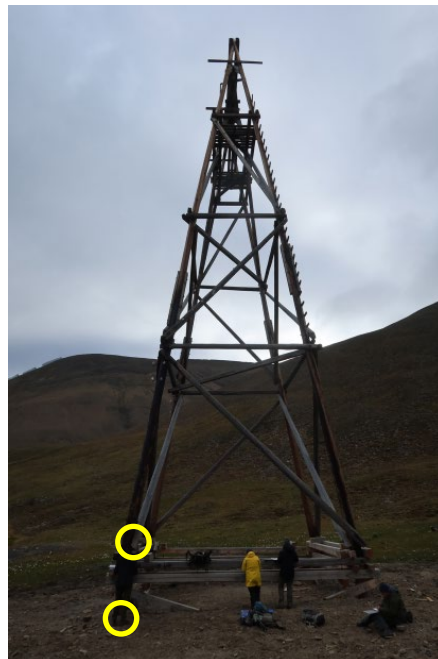
N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



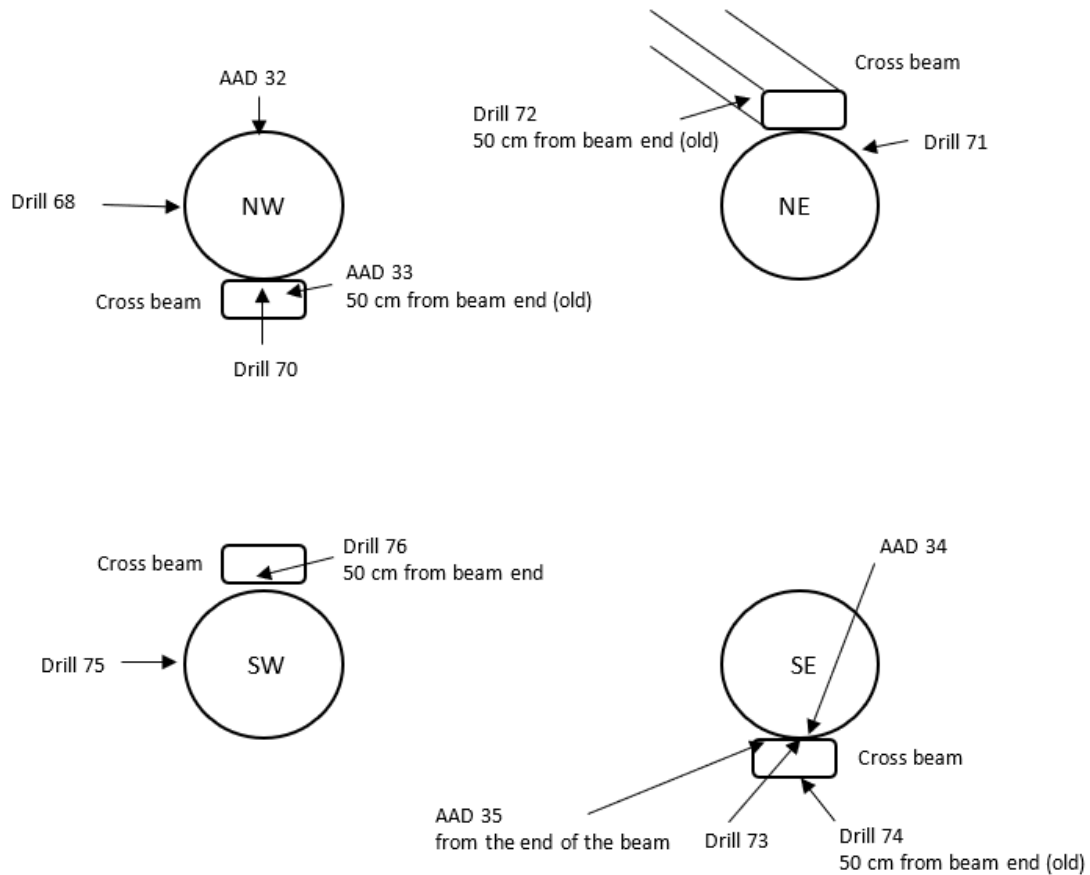
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-8

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Extensive improvement/replacement in the lower part and foundations in the near future. Creosote in vertical main posts. Apparently in good condition higher up in the construction, however, extensive fungal decay on the upper side of the inclined braces to the north. Should have been replaced. The cable car trestle stands in a flat lojn, but is very tall, and are situated close to a trafficked road.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



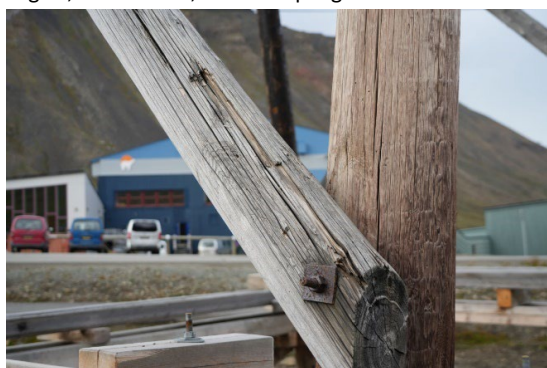
Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.5 Longyearbyen, line 2b, 158986-6

Askeladden ID	158986-6
Locality	Line 2b, cable car trestle 6 from the mine (Askeladden: trestle no. 6)
Map coordinate	EU89 UTM-sone 33, 8681613 N, 514010 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	28/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



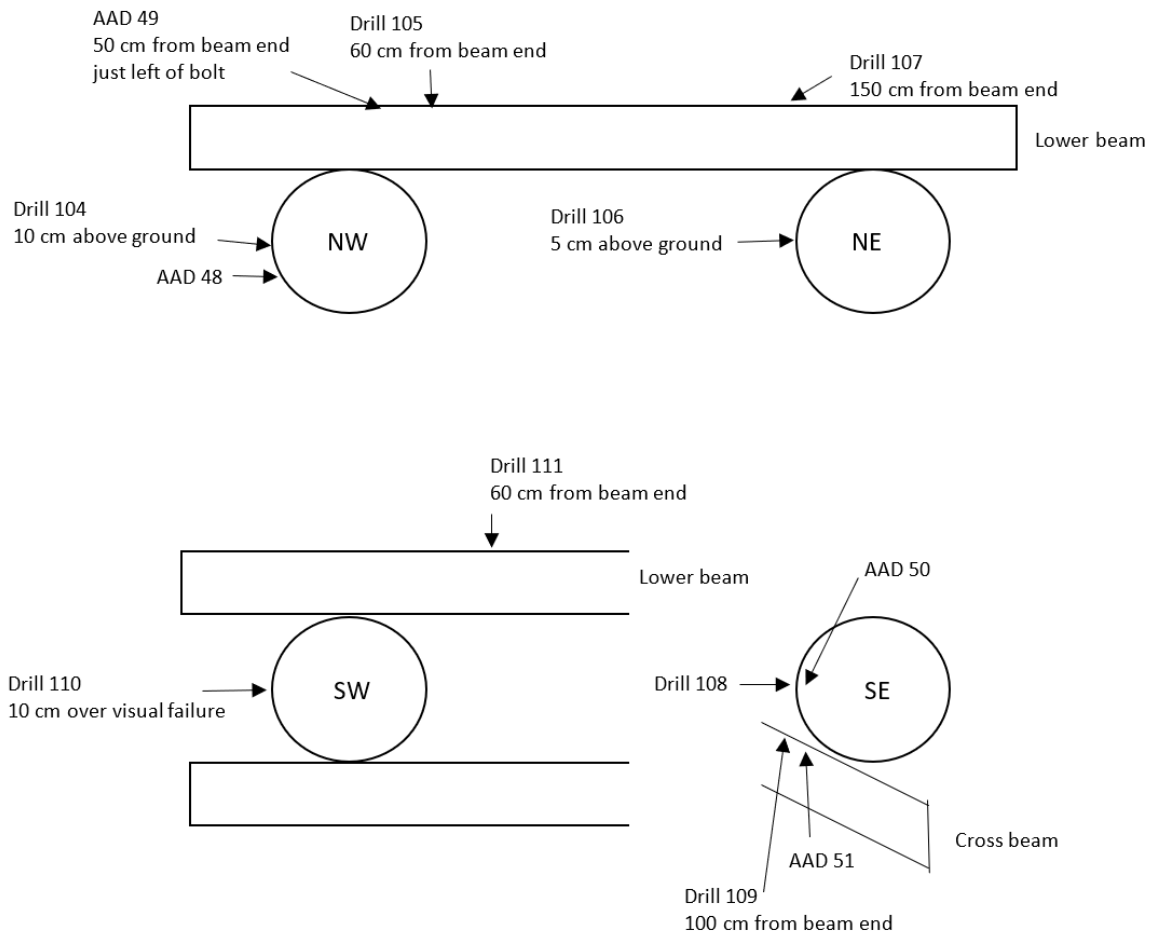
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-6

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Both foundation legs to the west are completely off due to fungal decay. The rest of the construction looks relatively intact/in good condition. Due to the decayed foundation legs the hole trestle is slightly twisted. The cable car trestle is very high and stands on a steep slope, next to the path leading up to the mine, and visitors get up close. At present, however, the mining facility and the surrounding area are closed to visitors due to a very unsafe and presumably poor condition.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

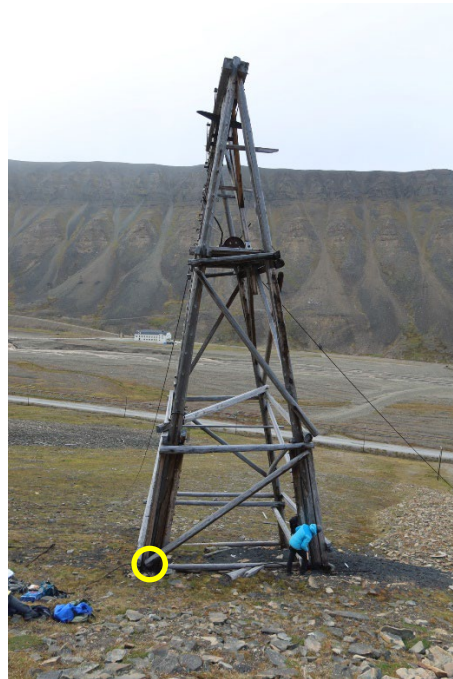
3.6 Longyearbyen, line 2b, 158986-5

Askeladden ID	158986-5
Locality	Line 2b, cable car trestle no. 5 from the mine (Askeladden: trestle no. 5)
Map coordinate	EU89 UTM-sone 33, 8681517 N, 513991 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	28/7 2022
Type of object/construction	Cable car trestle. Also used by the PCCH project

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



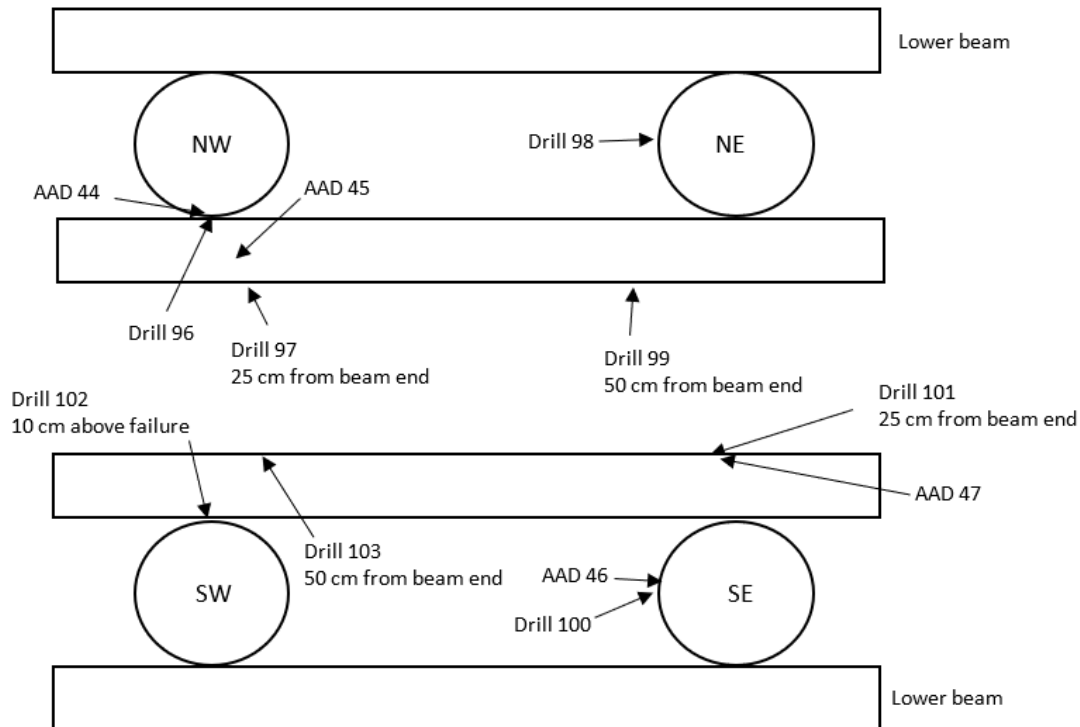
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-5

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Several of the lower horizontal crossbeams to the south/southeast have broken and/or are missing. Otherwise, the rest of the construction looks relatively intact. Foundation legs to the southwest are broken and completely decomposed by fungal decay. The foundation legs show signs of rot damage. The cable car trestle is very high and stands on a steep slope, next to the path up to the mine, and visitors get up close. At present, however, the mining facility and the surrounding area are closed to visitors due to a very unsafe and presumably poor condition.

Photos before and after wood sampling:



Leg NW, soil contact, before sampling



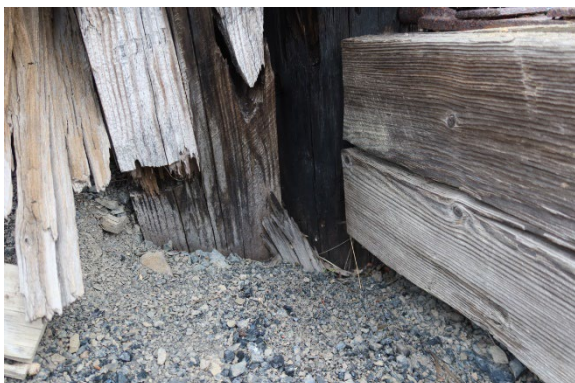
Leg NW, soil contact, after sampling



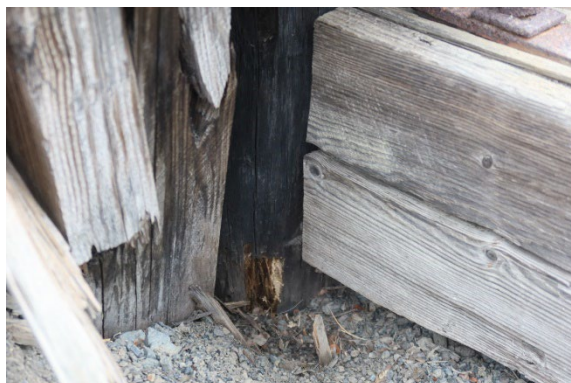
Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.7 Longyearbyen, line 2b, 158986-1

Askeladden ID	158986-1
Locality	Line 2b, cable car trestle no. 1 from the mine (Askeladden: trestle. no. 1)
Map coordinate	EU89 UTM-sone 33, 8681222 N, 513949 E
Registered by	Mari, Johan, Gry, Nanna
Date of registration	28/7 2022
Type of object/construction	Cable car trestle

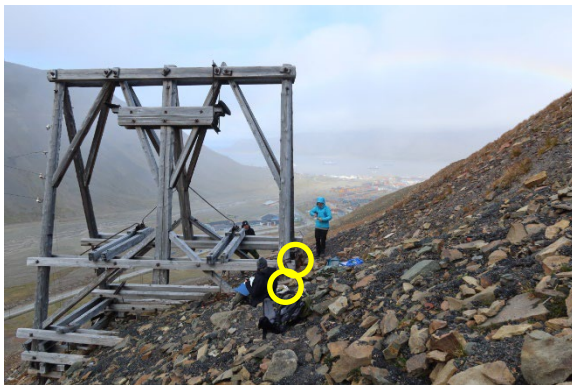
Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



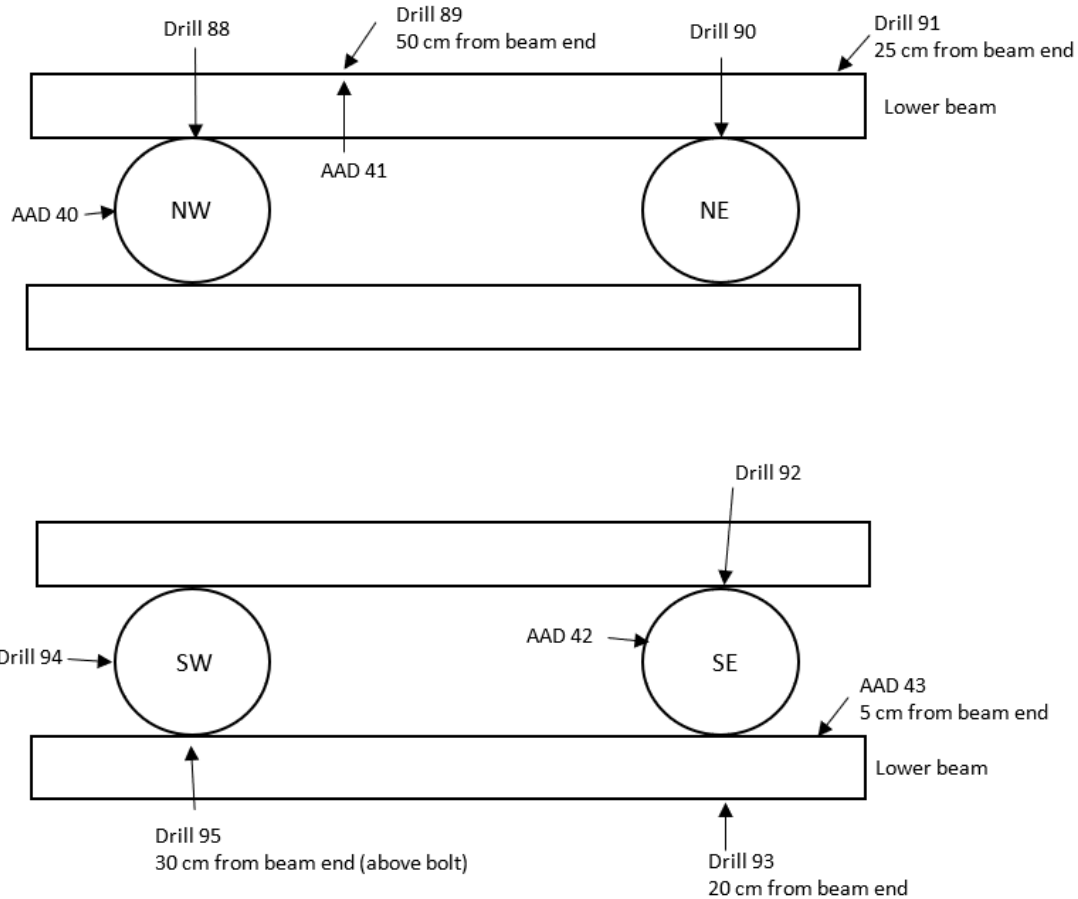
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158986-1

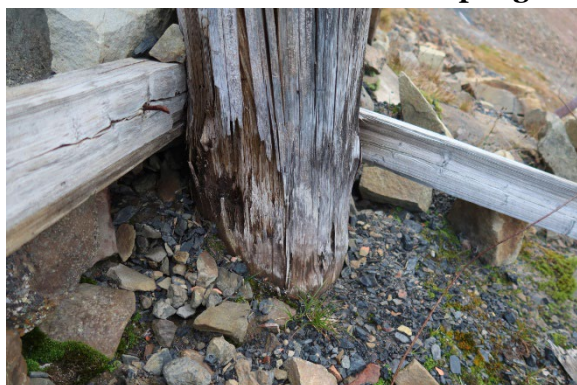
The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

The cable car trestle stands right up next to the mine's day plant. It is partially covered by landslide material. The trestle is low but stands on a steep slope. The foundation legs show signs of rot damage. As it stands in the path up to the mine, visitors get up close. At present, however, the mining facility and the surrounding area are closed to visitors due to a very unsafe and presumably poor condition.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



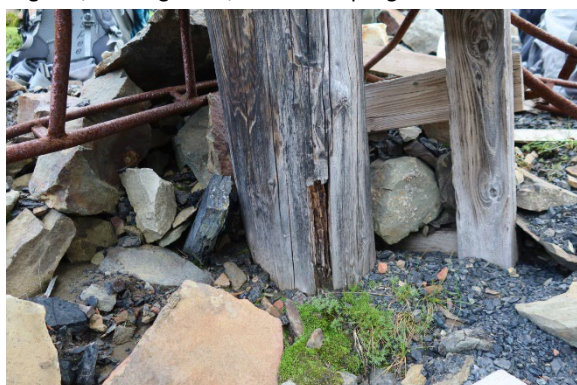
Leg NW, soil contact, after sampling



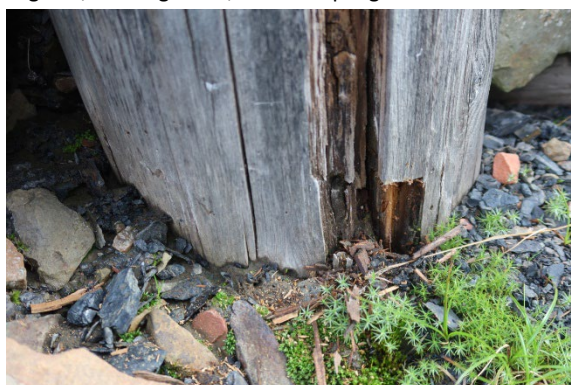
Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.8 Longyearbyen, line 3, 158619-32

Askeladden ID	158619-32
Locality	Line 3, cable car trestle no. 10 from the end of the line in, counted northeastern direction towards “Taubanesentralen” (Askeladden: trestle no. 32)
Map coordinate	EU89 UTM-sone 33, 8684721.72 N, 512420.52 E
Registered by	Mari, Johan, Gry, Nanna
Date of registration	30/7 2022
Type of object/construction	Cable car trestle. Also used by the PCCH project

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



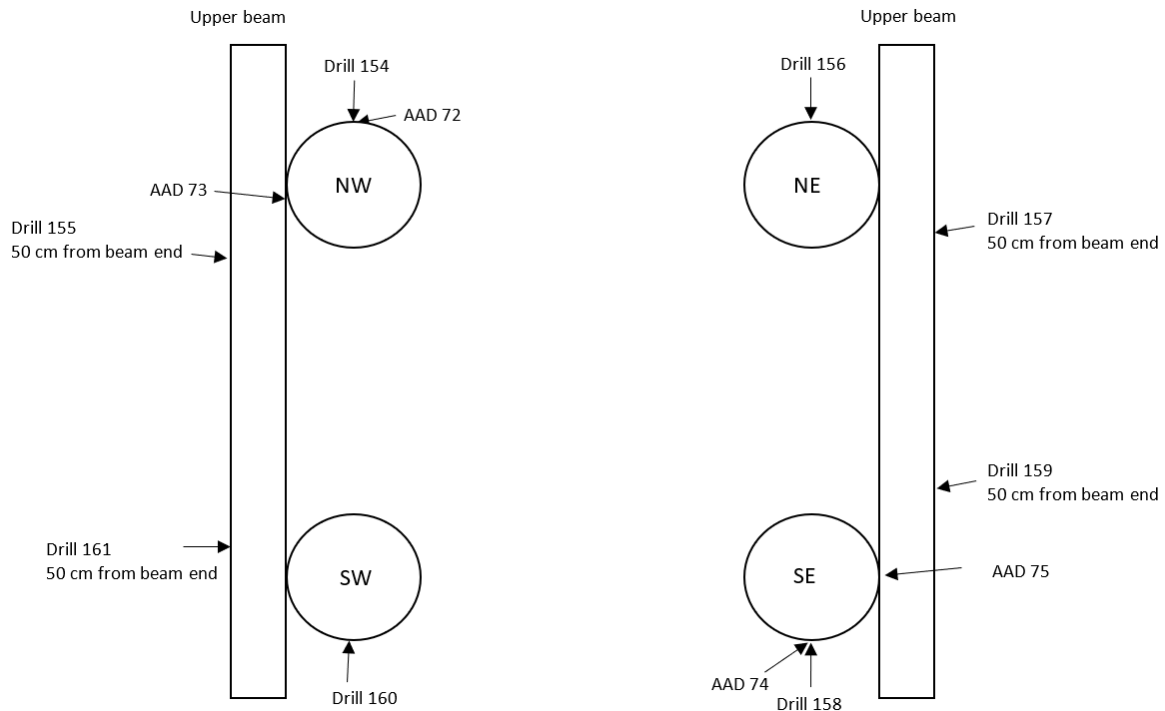
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 158619-32

The overview shows, from above, the position of decay detection drill performed in eight positions and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.

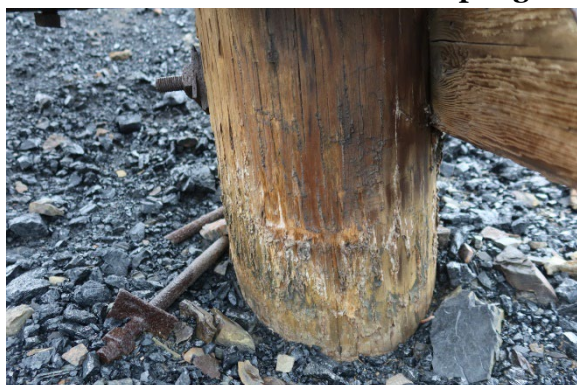


We suspect this cable car trestle is treated (creosote NW and NE, CCA/Cu SW and SE)

Visual overview

This cable car trestle is in surprisingly good condition. Visible salt impact from the ground on foundation legs in the south. Weathering, no rot on beams inspected above ground. This cable car trestle has not been repaired but is in original materials. All the trestles (except from two) in this line were completely replaced while the facility was still in operation. However, we have not been able to find information about when this happened.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



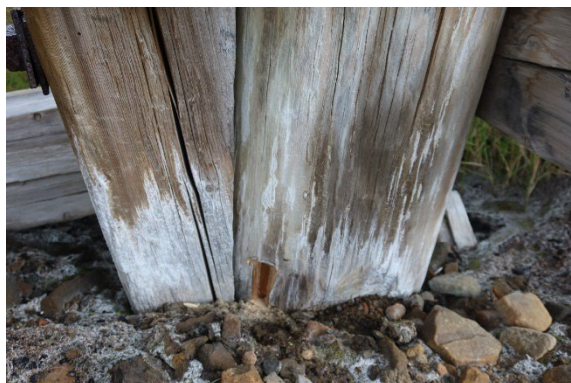
Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.9 Longyearbyen, line 5/6, 87889-1

Askeladden ID	87889-1
Locality	Line 5/6, cable car trestle no. 1 from “taubanestasjonen” towards east (Askeladden: trestle no. 3)
Map coordinate	EU89 UTM-sone 33, 8683214 N, 515328 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	2 /7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



SW

NE



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-1

The overview shows the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.

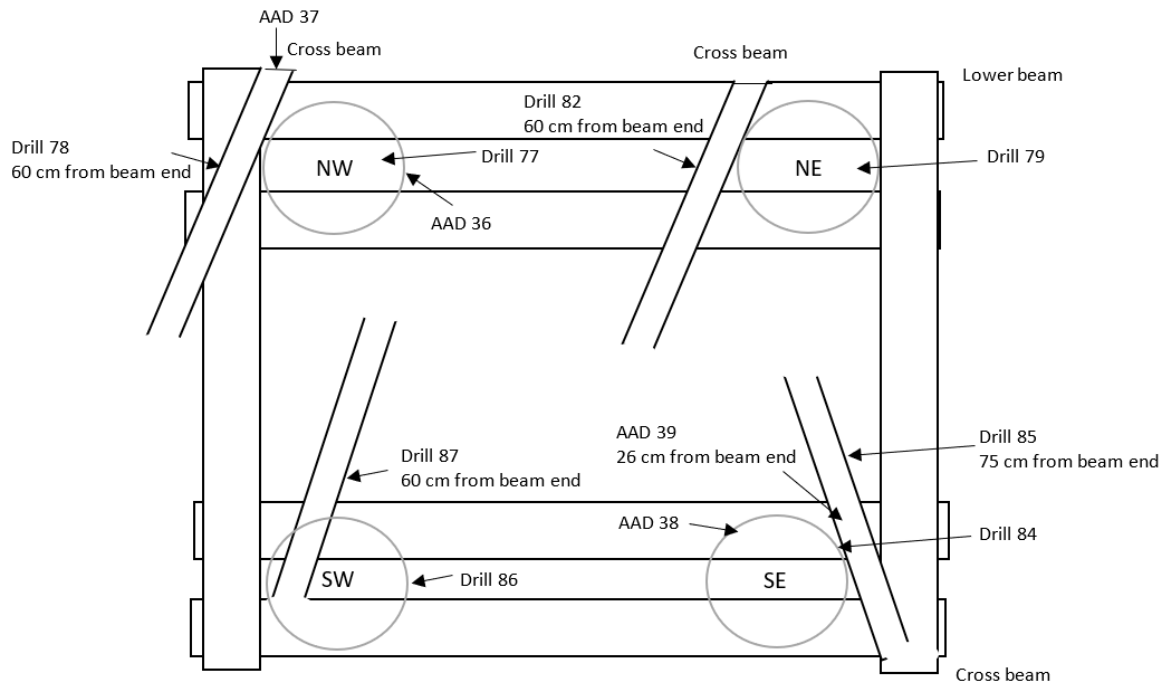


Illustration of sampling

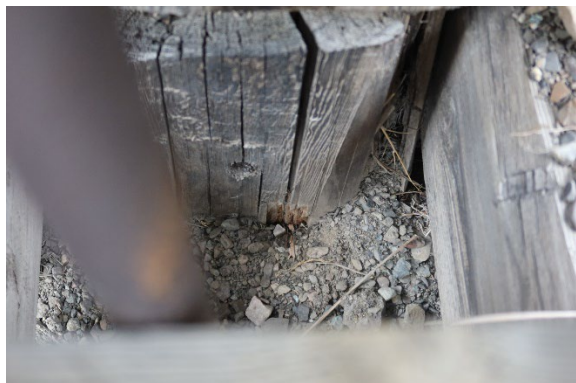
Visual overview

On this cable car trestle, restoration work has started, but has apparently stopped without being completed. There is no visible damage and apparently the trestle is in good condition. The trestle is very tall and stands right next to the road. It can therefore potentially pose a major danger to passers-by.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.10 Longyearbyen, line 5/6, 87889-14

Askeladden ID	87889-14
Locality	Mine 5/6, cable car trestle no. 6 from “taubanesentralen” no. 1 from Vei 200/Hilmar Rekstens vei (Askeladden: trestle no. 6)
Map coordinate	EU89 UTM-sone 33, 8682900 N, 514761 E
Registered by	Mari, Johan, Gry, Nanna
Date of registration	30/7 2022
Type of object/construction	Cable car trestle. Also used by the PCCH project

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



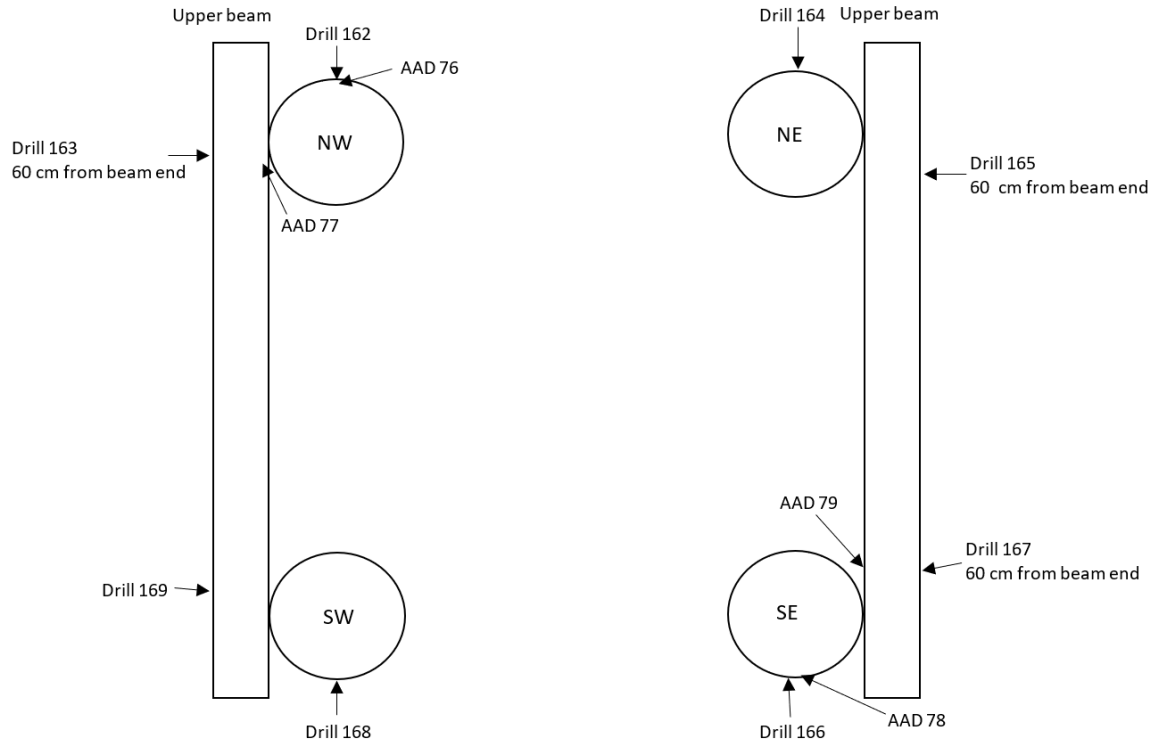
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-14

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

This cable car trestle has recently been restored and the lower parts have been completely replaced. The trestle is therefore in good condition. It is situated close to where people pass, with snowmobile parking and houses close by, and is very tall. It is therefore important that it is restored.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.11 Longyearbyen, line5/6, 87889-16 replacement

Askeladden ID	87889-16
Locality	Line 5/6, cable car trestle no. 8 from “taubanestasjonen” towards east, (Askeladden: trestle no. 8)
Map coordinate	EU89 UTM-sone 33, 8682732 N, 514990 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	2/8 2022
Type of object/construction	Cable car trestle

Store Norske Spitsbergen Kulkompani (SNSK) had done replacements on cable car trestle 8 (Gruvedalen) 87889-16? And left some of the above ground joint in storage for further analysis by *ArcticAlpineDecay*. It was possible to tell if the legs had been situated towards north or south, but east/west orientation was not discernible.

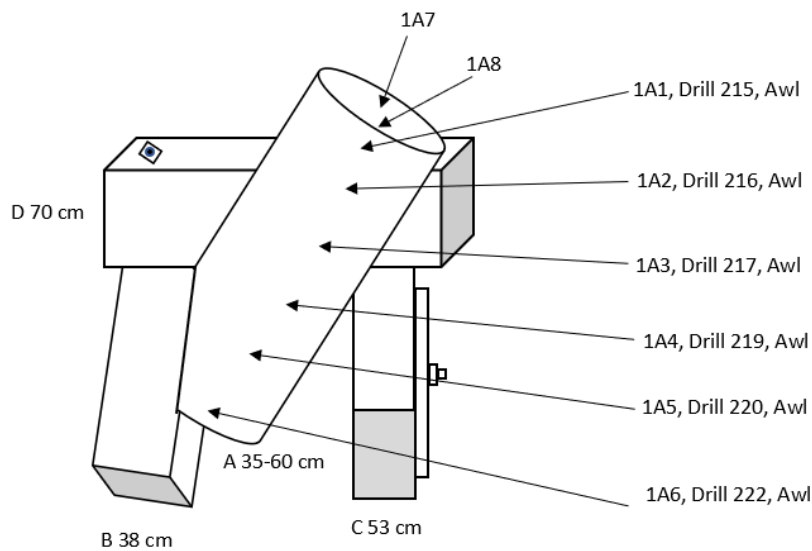
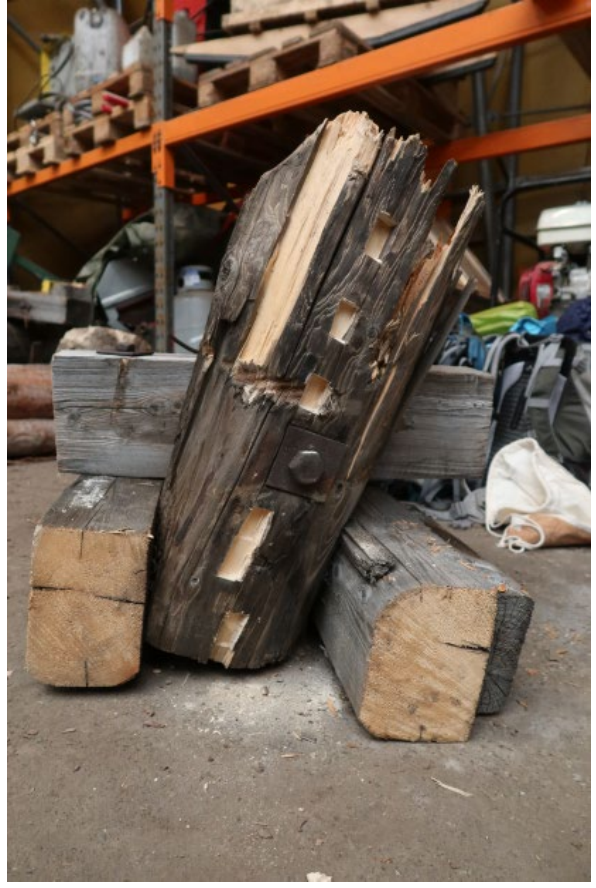


Illustration of sampling from object 1 (north leg) from replacement of cable car trestle 87889-16



Cable car trestle 87889-16, object 1. Overview



Cable car trestle 87889-16, object 1. Samples 1A1-1A6



Cable car trestle 87889-16, object 1. Sample 1A7



Cable car trestle 87889-16, object 1. Sample 1A8

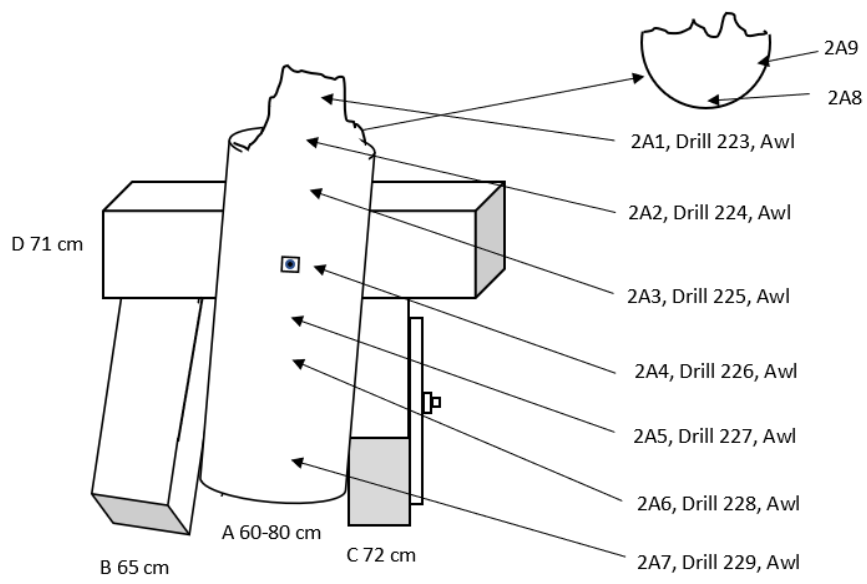


Illustration of sampling from object 2 (north leg) from replacement of cable car trestle 87889-16



Cable car trestle 87889-16, object 2. Overview



Cable car trestle 87889-16, object 2. Sample 2A1-2A7



Cable car trestle 87889-16, object 2. Overview



Cable car trestle 87889-16, object 2. Cutting of sample 2A8



Cable car trestle 87889-16, object 2. Location of sample 2A9



Cable car trestle 87889-16, object 2. Sample 2A9

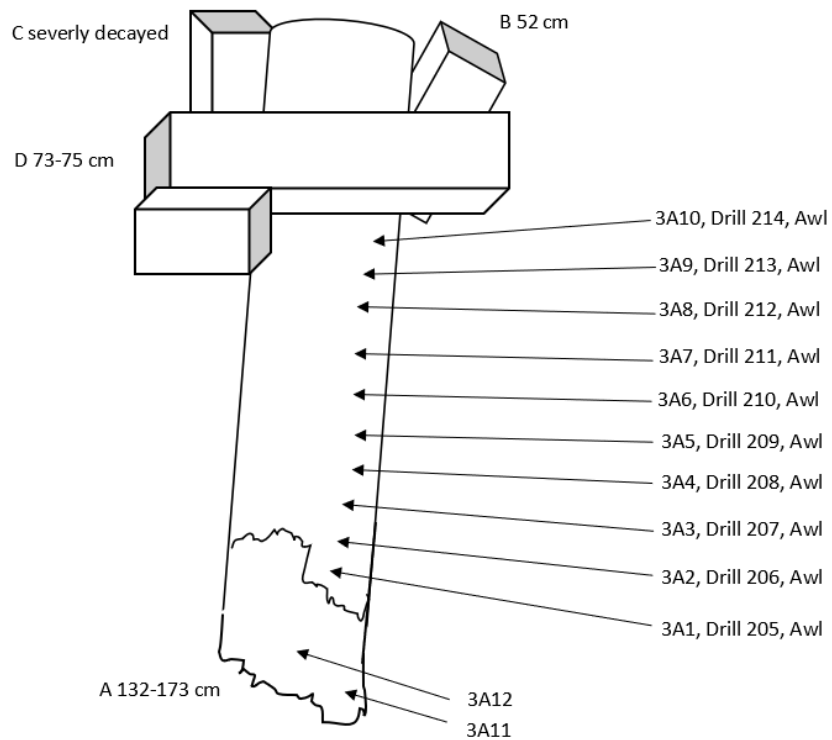


Illustration of sampling from object 3 (south leg) from replacement of cable car trestle 87889-16



Cable car trestle 87889-16, object 3. Overview



Cable car trestle 87889-16, object 3. Sample 3A1-3A10



Cable car trestle 87889-16, object 3. Location of sample 3A11



Cable car trestle 87889-16, object 3. Cutting of sample 3A12

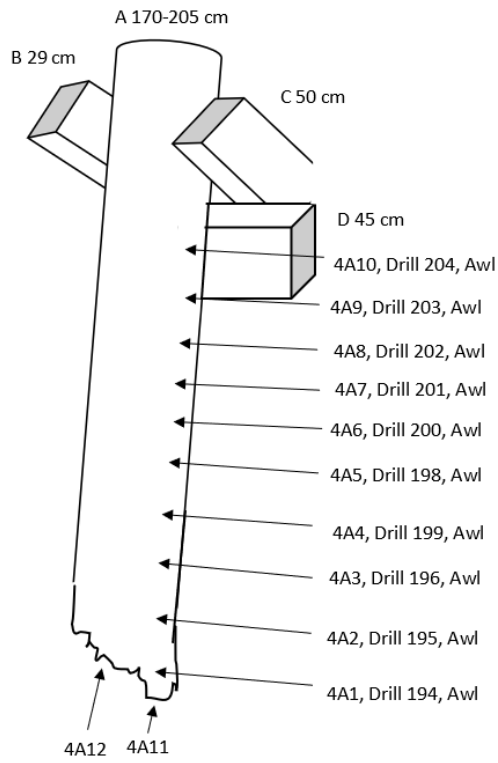


Illustration of sampling from object 4 (south leg) from replacement of cable car trestle 87889-16



Cable car trestle 87889-16, object 4. Sample 4A1-4A10



Cable car trestle 87889-16, object 4. Location of sample 4A11



Cable car trestle 87889-16, object 4. Location of sample 4A12



Cable car trestle 87889-16, object 4. Sample 4A12

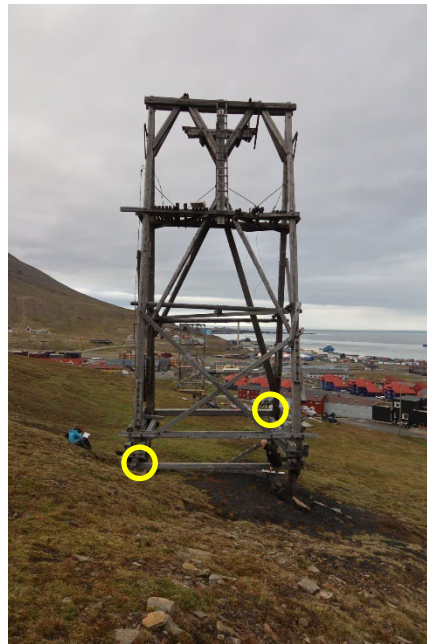
3.12 Longyearbyen, line 5/6, 87889-17

Askeladden ID	87889-17
Locality	Line 5/6, cable car trestle no. 9 from “taubanestasjonen” and cable car trestle no. 4 from the road (Vei 200/Hilmar Rekstens vei) (Askeladden: trestle no. 9)
Map coordinate	EU89 UTM-sone 33, 8682671 N, 515082 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	30/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



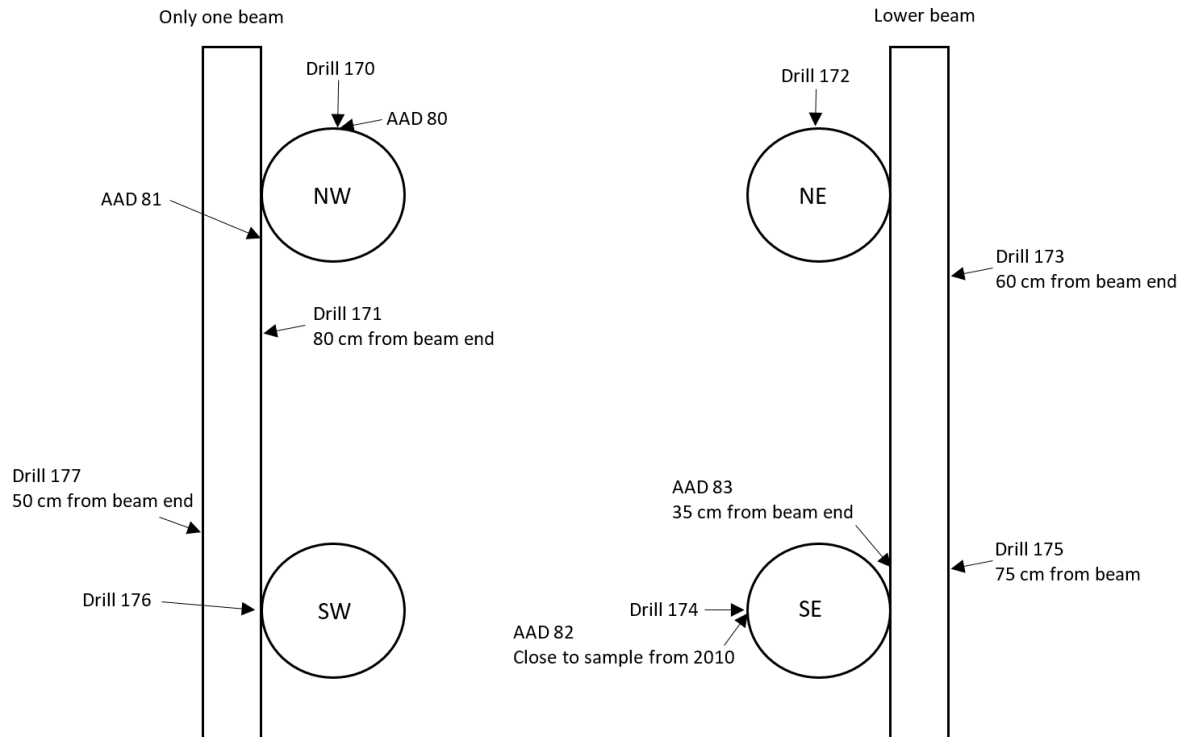
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-17

The overview shows the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

This cable car trestle has not been restored but hold original materials/timber. Several of the foundations/legs have extensive rot damage in the transition between ground and air, and the foundation has slipped partly due to solifluction, and partly due to rot. The trestle is therefore in poor condition. It is situated in a slope and will therefore continue sliding. The trestle is close to the ski lift and close to people.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



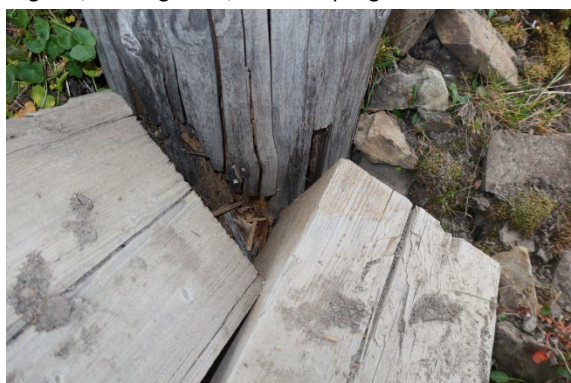
Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



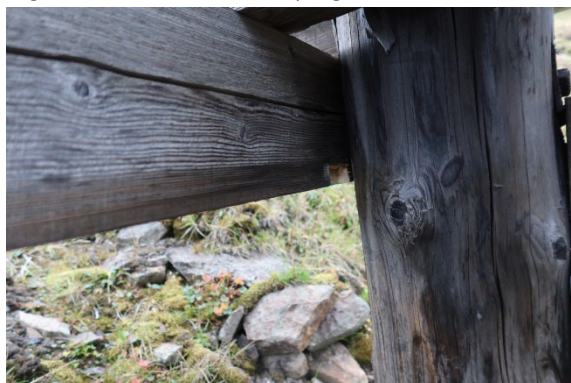
Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.13 Adventsdalen, line 5/6, 87889-53

Askeladden ID	87889-53
Locality	Line 5/6, Adventsdalen cable car trestle no. 4 from “vinkelstasjonen” towards the city (Askeladden: trestle no. 44)
Map coordinate	EU89 UTM-sone 33, 8680619 N, 517889 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	29/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



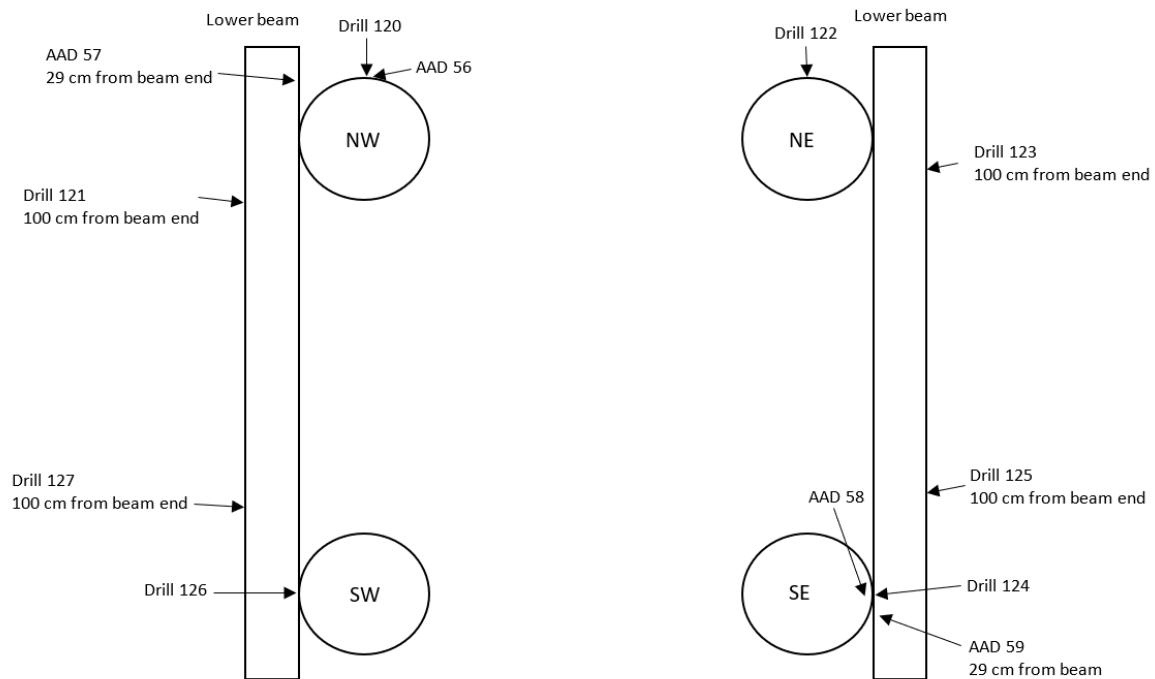
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-53

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

This cable car trestle is apparently in good condition in main structure/foundations and horizontal cross beams. The trestle is low and stands on flat terrain. This cable car trestle has not been restored but hold original materials/timber. There are traces that may indicate rot damage in the foundations in the transition between ground and air. The trestle stands far from human traffic and poses little risk of damage to people and property.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.14 Endalen, line 5, 87889-61

Askeladden ID	87889-61
Locality	Line 5, Endalen, cable car trestle no. 6 from “vinkelsasjonen” towards mine 5 (Askeladden: trestle no. 18)
Map coordinate	EU89 UTM-sone 33, 8680065 N, 517891 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	29/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



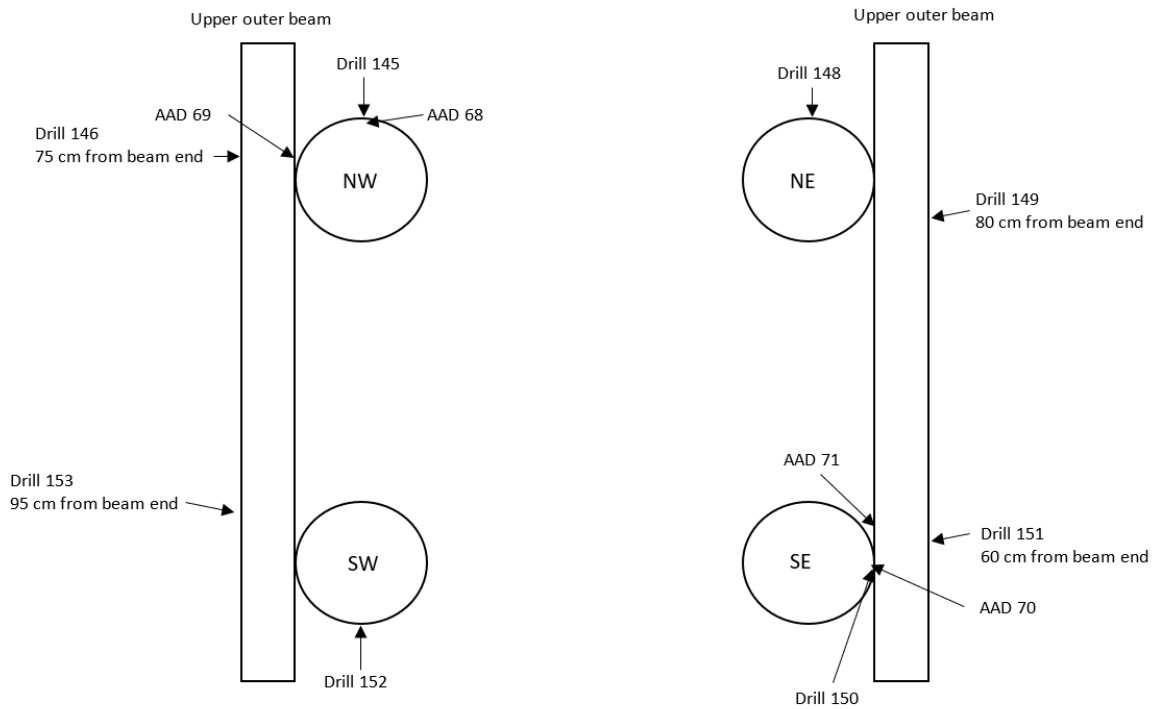
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-61

The overview shows the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Fungal decay in all foundations/legs, but only critical condition in north-eastern leg. Horizontal beams in good condition. Good condition upwards in the construction. This cable car trestle has not been restored but hold original materials/timber. It is high, however the trestle stands far from human traffic and poses little risk of damage to people and property.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.15 Endalen, line 5, 87889-63

Askeladden ID	87889-63
Name locality	Line 5, Endalen, cable car trestle no. 8 from “vinkelstasjonen” towards mine 5 (Askeladden: trestle no. 16)
Map coordinate	EU89 UTM-sone 33, 8679912 N, 517795 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	29/7 2022
Type of object/construction	Cable car trestle. Also used by the PCCH project.

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



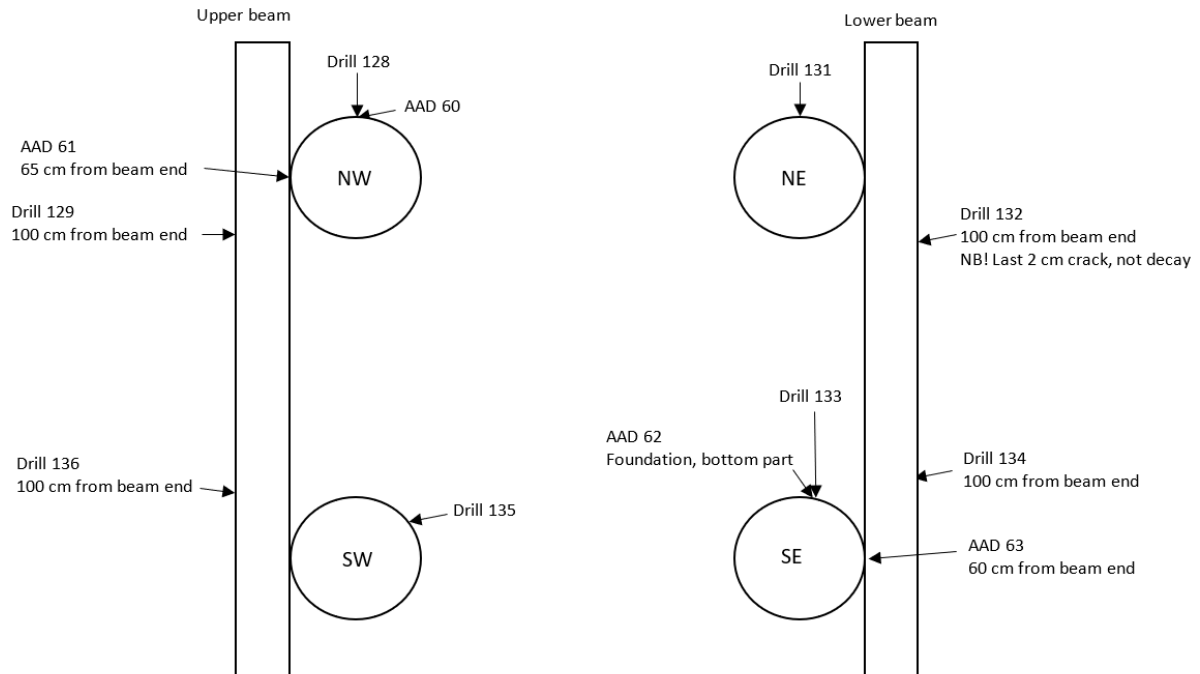
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-63

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Fungal decay in all foundation logs/legs. Some fungal decay in horizontal beams in the lower arrangement. Apparently good condition higher up in the structure. This cable car trestle has not been restored but hold original materials/timber. It stands far from human traffic and poses little risk of damage to people and property.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.16 Endalen, line 5, 87889-66

Askeladden ID	87889-66
Locality	Line 5, Endalen, cable car trestle no. 11 from “vinkelstasjonen” towards mine 5 (Askeladden: trestle no. 13)
Map coordinate	EU89 UTM-sone 33, 8679722 N, 517675 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	29/7 2022
Type of object/construction	Cable car trestle

Overview photos – cardinal directions, overview of whole trestle



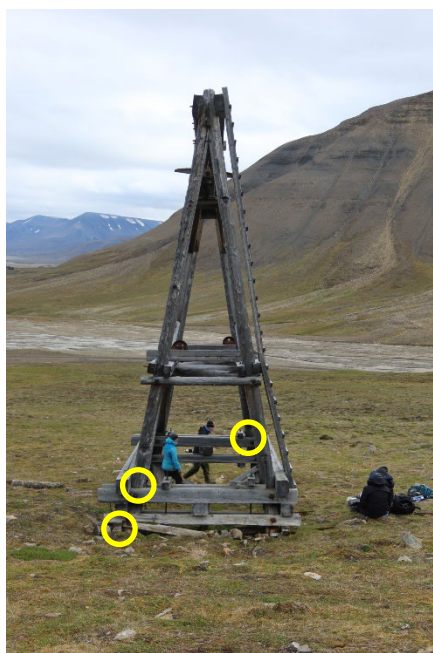
N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



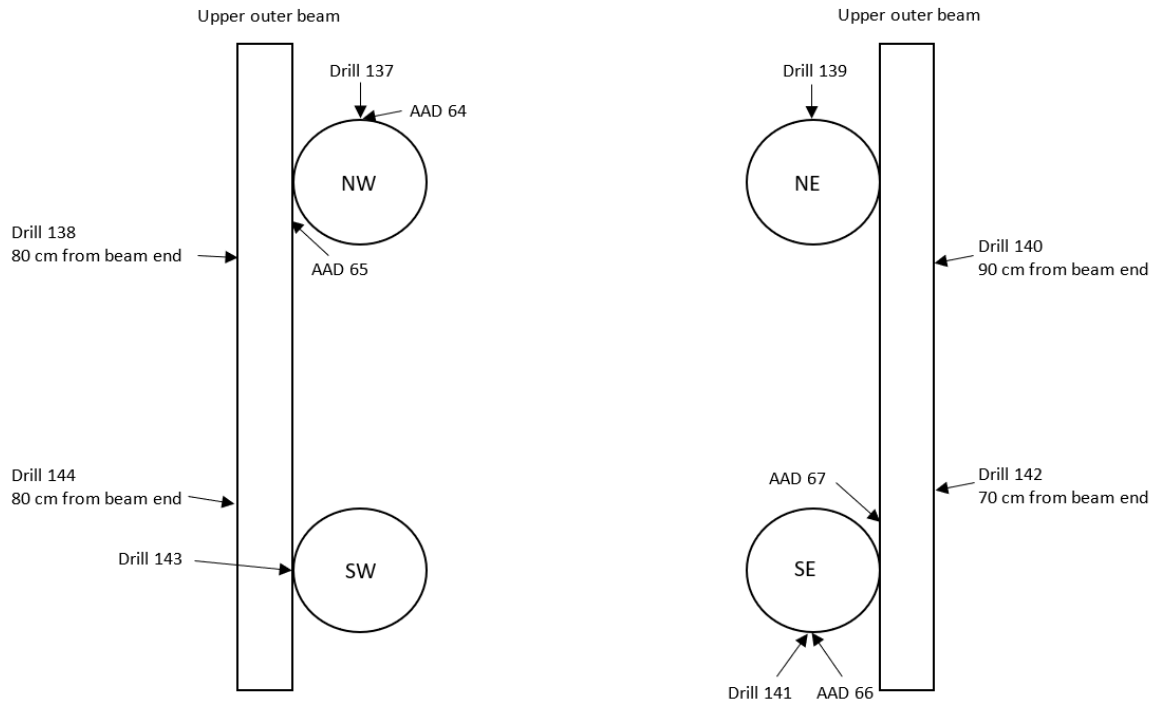
SW



SE

Schematic drawing/overview of examined timbers in cable car trestle 87889-66

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Displacement in the foundation to the east. some fungal decay in the foundations/legs. Apparently good condition higher up in the structure. This cable car trestle has not been restored but hold original materials/timber. It stands far from human traffic and poses little risk of damage to people and property.

Photos before and after wood sampling



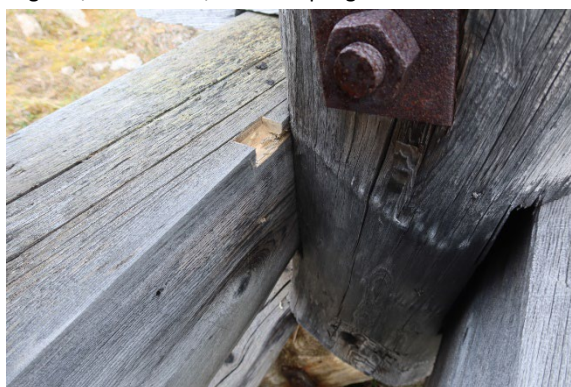
Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



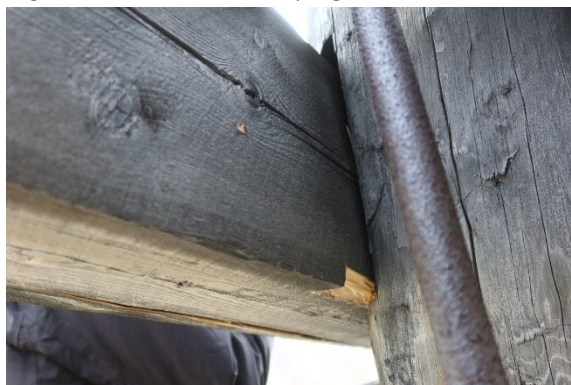
Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.17 Adventdalen, line 6, 87889-79

Askeladden ID	87889-79
Locality	Line 6, Adventdalen, cable car trestle 1 from “vinkelstasjonen” towards mine 6 (Askeladden: trestle no. 40)
Map coordinate	EU89 UTM-sone 33, 8680401 N, 518182 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	29/7 2022
Type of object/construction	Cable car trestle

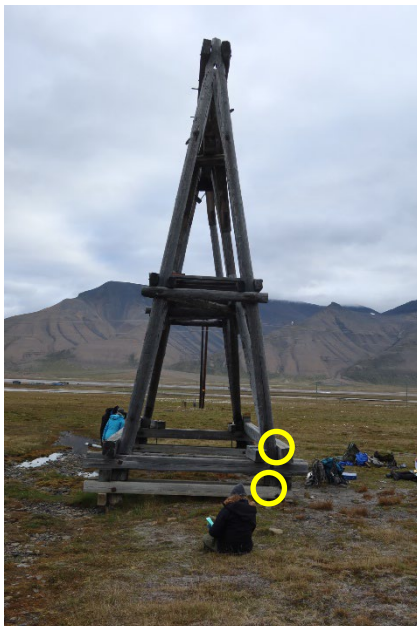
Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



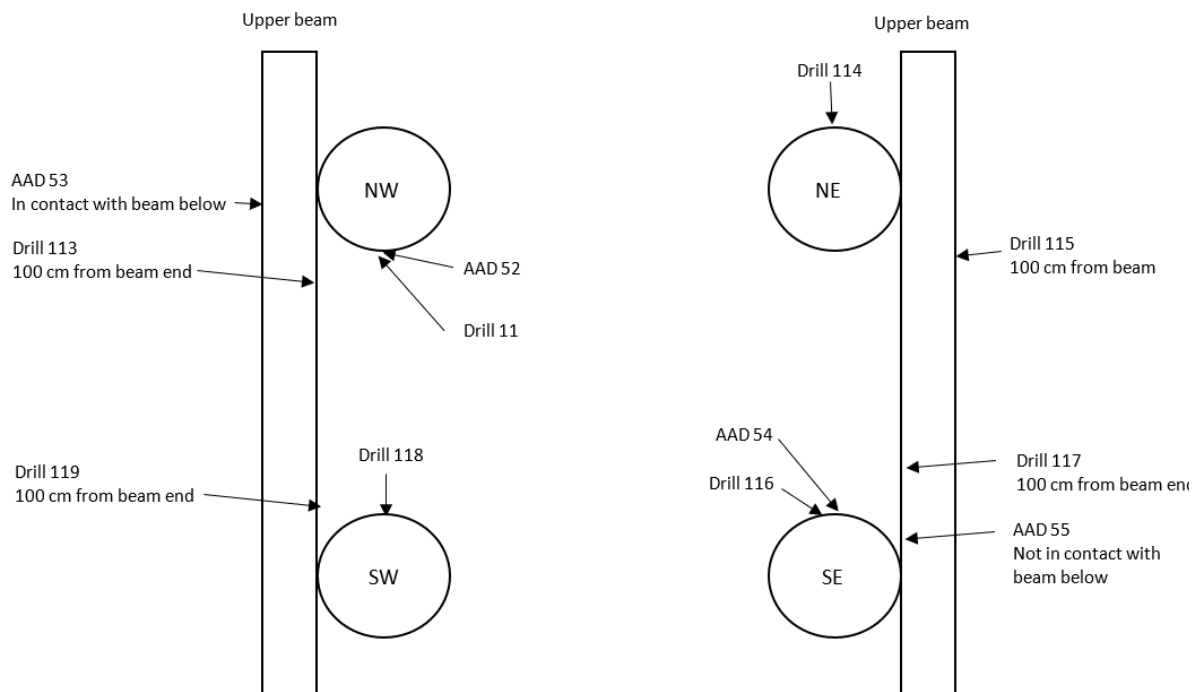
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 87889-79

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Apparently good condition higher up in the structure. Mechanical damage in the lower horizontal beams to the north-west at the foundation/legs. Fungal decay at the ends of inclined braces against the foundation in contact with the ground. The trestle is low and stands on flat terrain. This cable car trestle has not been restored but hold original materials/timber. The foundations hold signs of fungal decay in the transition between ground and air. It is situated far from human traffic and poses little risk of damage to people and property.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.18 Adventdalen, line 6, 87889-111

Askeladden ID	87889-111
Name locality	Line 6, Adventdalen cable car trestle 3 from the road to Mine 6, crossing the line, towards “vinkelstasjonen” (Askeladden: trestle no. 8)
Map coordinate	EU89 UTM-sone 33, 8678470 N, 520488 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	31/7 2022
Type of object/construction	Cable car trestle. Also used by the PCCH project

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



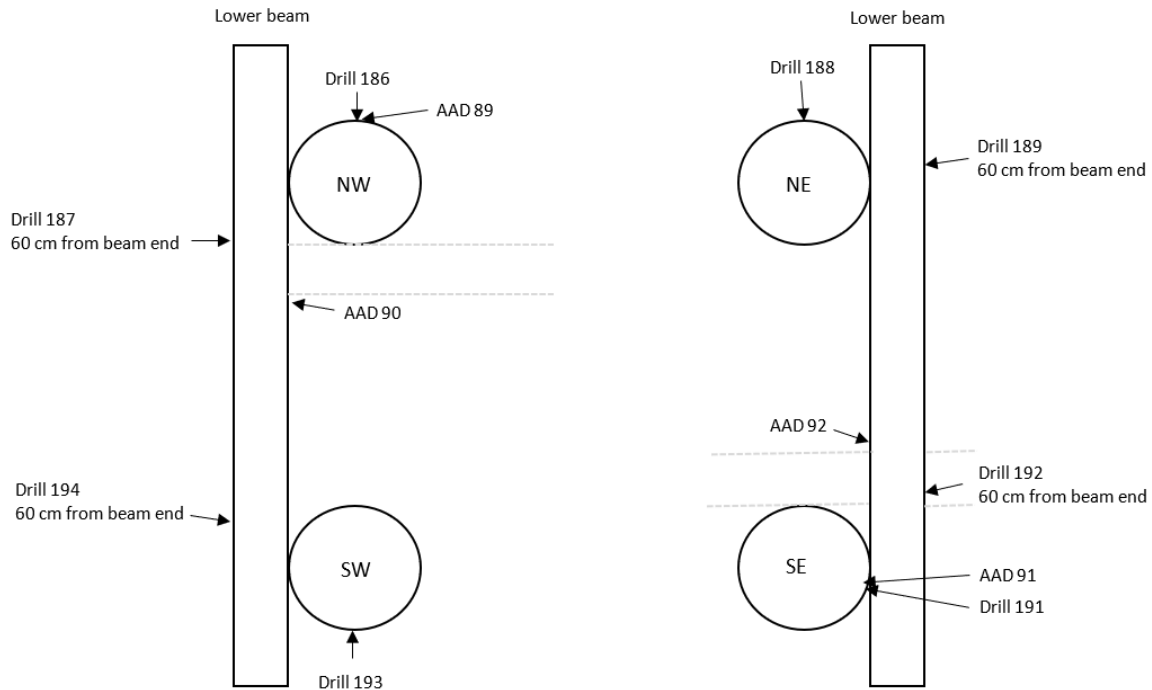
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 87889-111

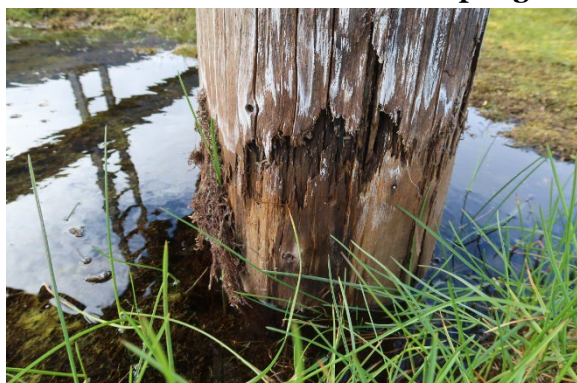
The overview shows the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Fungal decay in all foundations/legs. Some salt rash on the lower part of the foundation legs. All foundations are standing in water. Horizontal crossbeams to the south and north are broken. The construction above the foundation legs appears to be in good condition. A lot of "modern" rubbish lies around the trestle. This cable car trestle has not been restored but hold original materials/timber. It is situated in the area where the Svalbard ski marathon organizes the start and finish, but the area is large, and the trestle poses little risk of damage to people and property.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

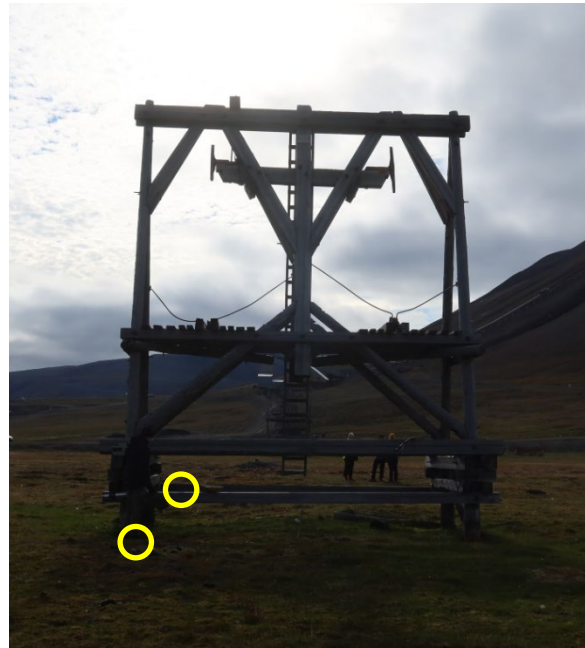
3.19 Adventdalen, line 6, 87889-112

Askeladden ID	87889-112
Locality	Line 6, Adventdalen, cable car trestle 2 from the road to Mine 6, crossing the line, towards “vinkelstasjonen” (Askeladden: trestle no. 7)
Map coordinate	EU89 UTM-sone 33, 8678408 N, 520562 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	31/7 2022
Type of object/construction	Cable car trestle. Also used by the PCCH project

Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg/wall. Taken from different directions depending on structure



NW



NE



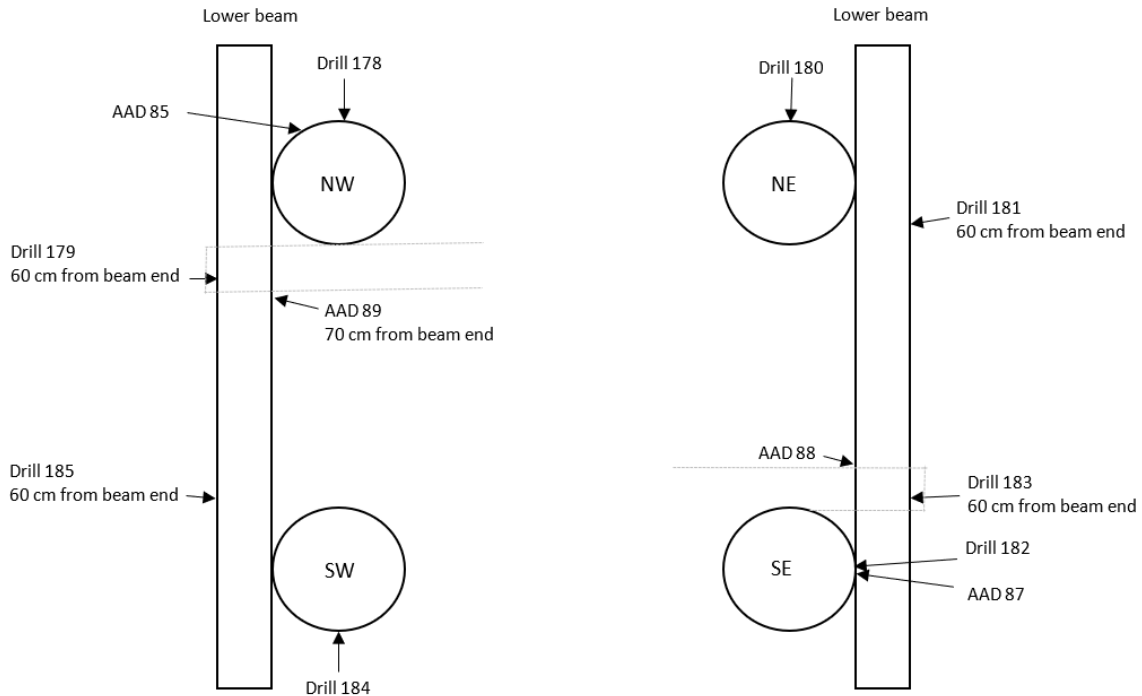
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 87889-112

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Fungal decay in all foundations/legs. Some salt rash on the lower part of the foundation legs. All foundations are standing in water. Horizontal crossbeams to the south and north are broken. The construction above the foundation legs appears to be in good condition. This cable car trestle has not been restored but hold original materials/timber. It is situated in the area where the Svalbard ski marathon organizes the start and finish and close to the road leading to Mine 6, but the area is large, and the trestle poses little risk of damage to people and property.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



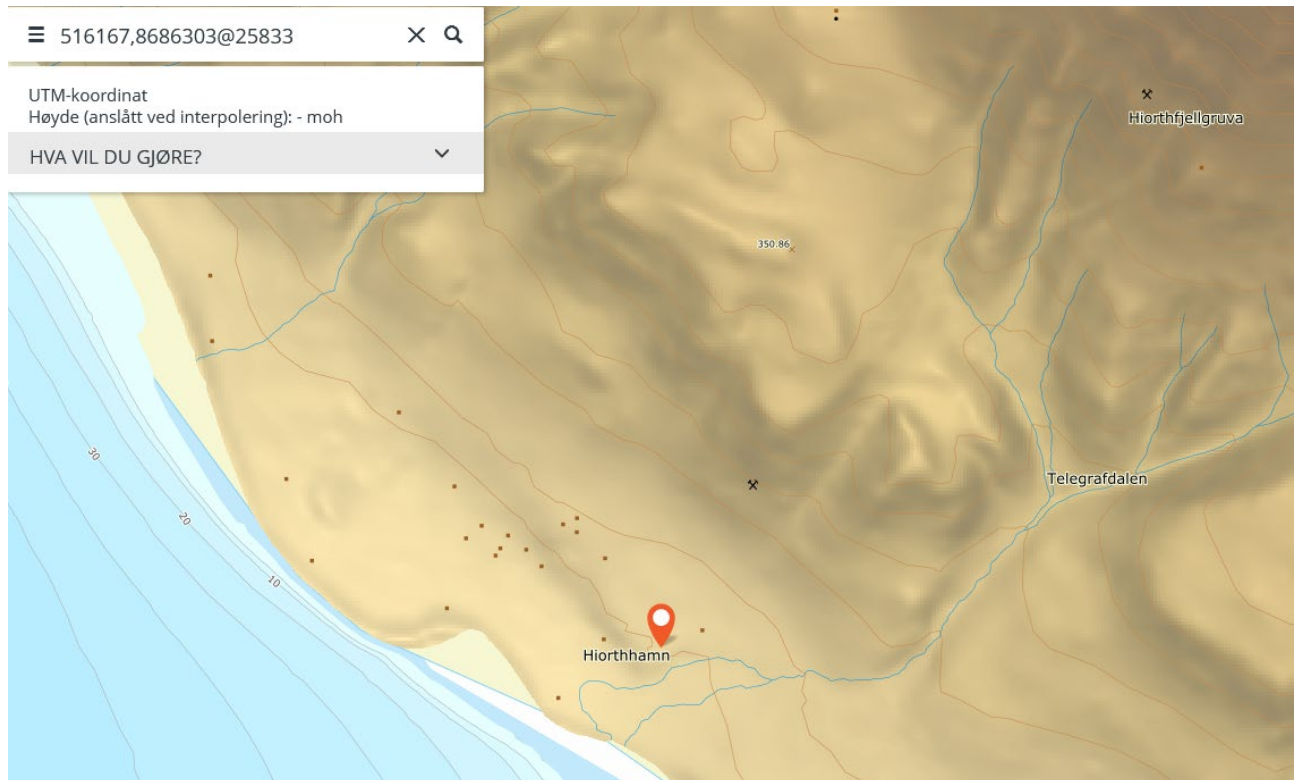
Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.20 Hiorthhamn, 93041 (no. 1 from the shore)

Askeladden ID	93041 (no. 1 counted from the shore)
Locality	Cable car trestle no. 1 from the shore
Map coordinate	EU89 UTM-sone 33, 8686303 N 516167 E – approximate position. See map capture from norgeskart.no below.
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	27/7 2022
Type of object/construction	Cable car trestle



Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



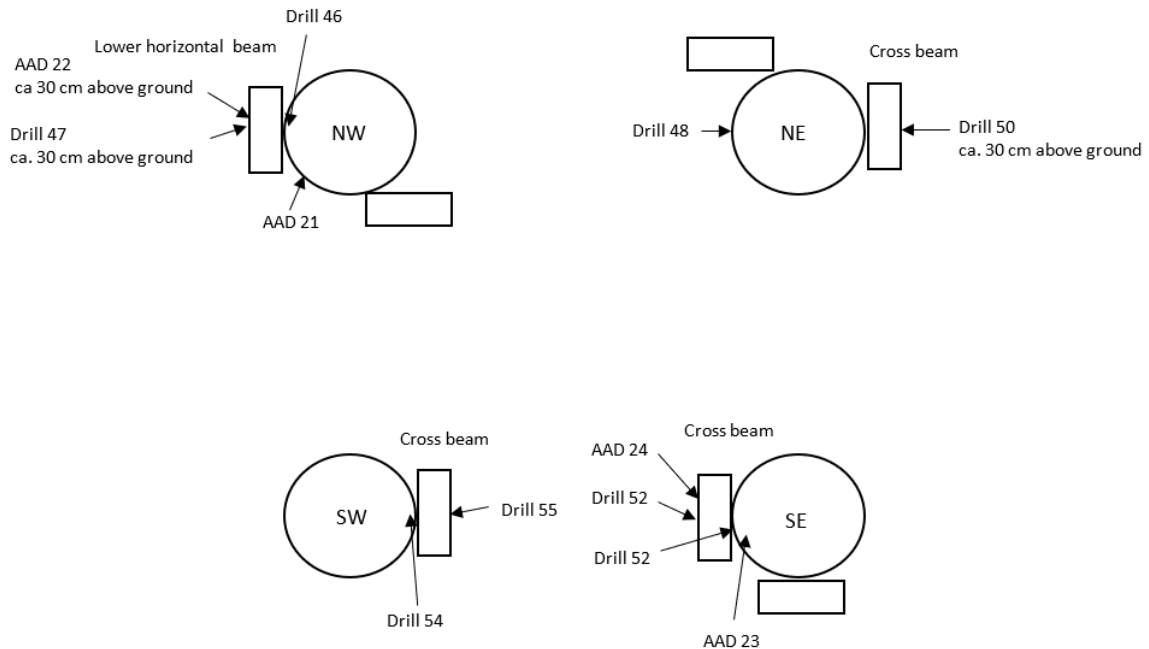
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 93041 (no. 1 from the shore)

The overview shows the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

Coal deposits around the legs of the cable car trestle. The cable car trestle seems to be in relatively good condition, but signs of possible decay in two legs (NW and SW). Structures further up seems to be in good conditions. Located close to the “taubanestasjon” and probably quite frequently visited by tourists and locals who use the cabins nearby.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



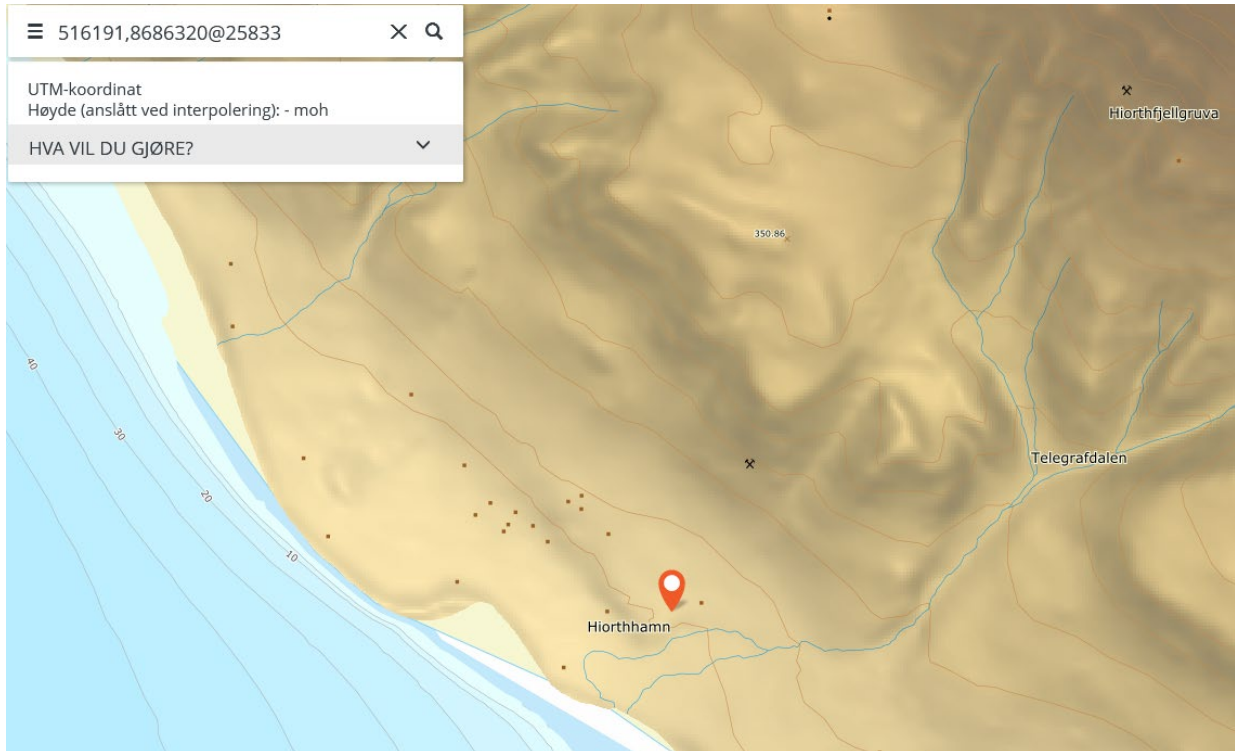
Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.21 Hiorthhamn, 93041 (no. 2 from the shore)

Askeladden ID	93041 (no. 2 counted from the shore)
Locality	Cable car trestle no. 2 from the shore
Map coordinate	EU89 UTM-sone 33, 8686320 N 516191 E – approximate position. See map capture from norgeskart.no below.
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	27/7 2022
Type of object/construction	Cable car trestle



Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



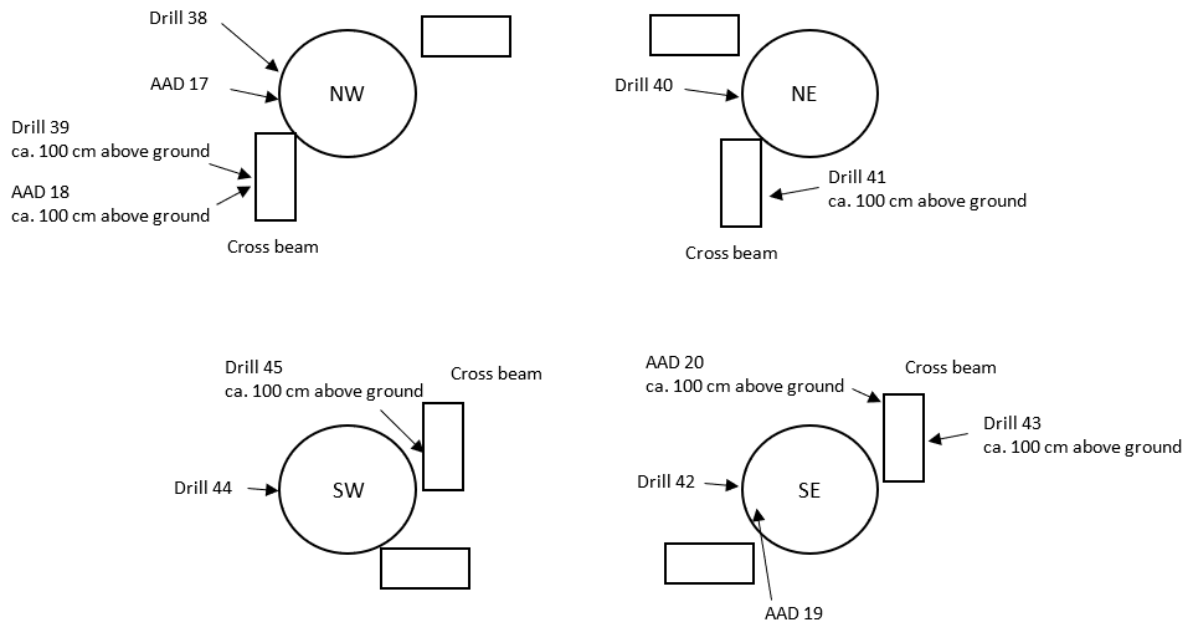
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 93041 (no. 2 from the shore)

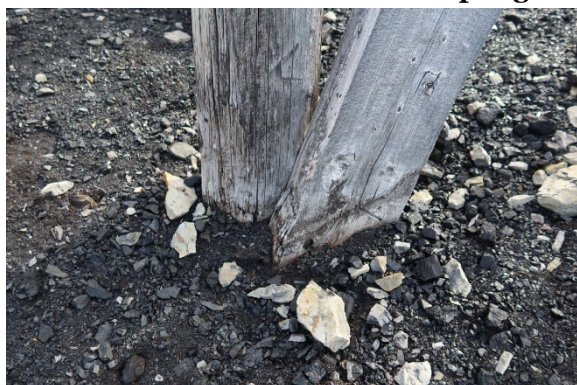
The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



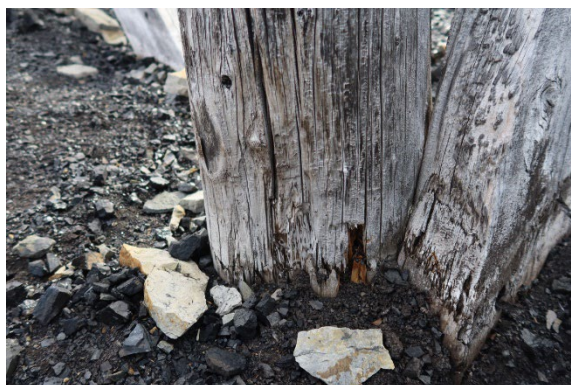
Visual overview

Coal deposits around the legs of the cable car trestle. The cable car trestle seems to be in relatively good condition. Structures further up seems to be in good conditions. Located close to the “taubanestasjon” and probably quite frequently visited by tourists and locals who use the cabins nearby.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



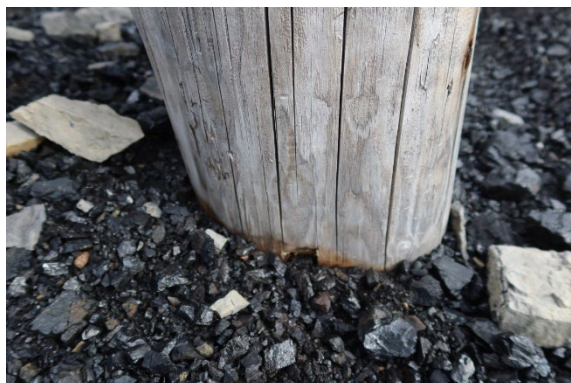
Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling

Not available

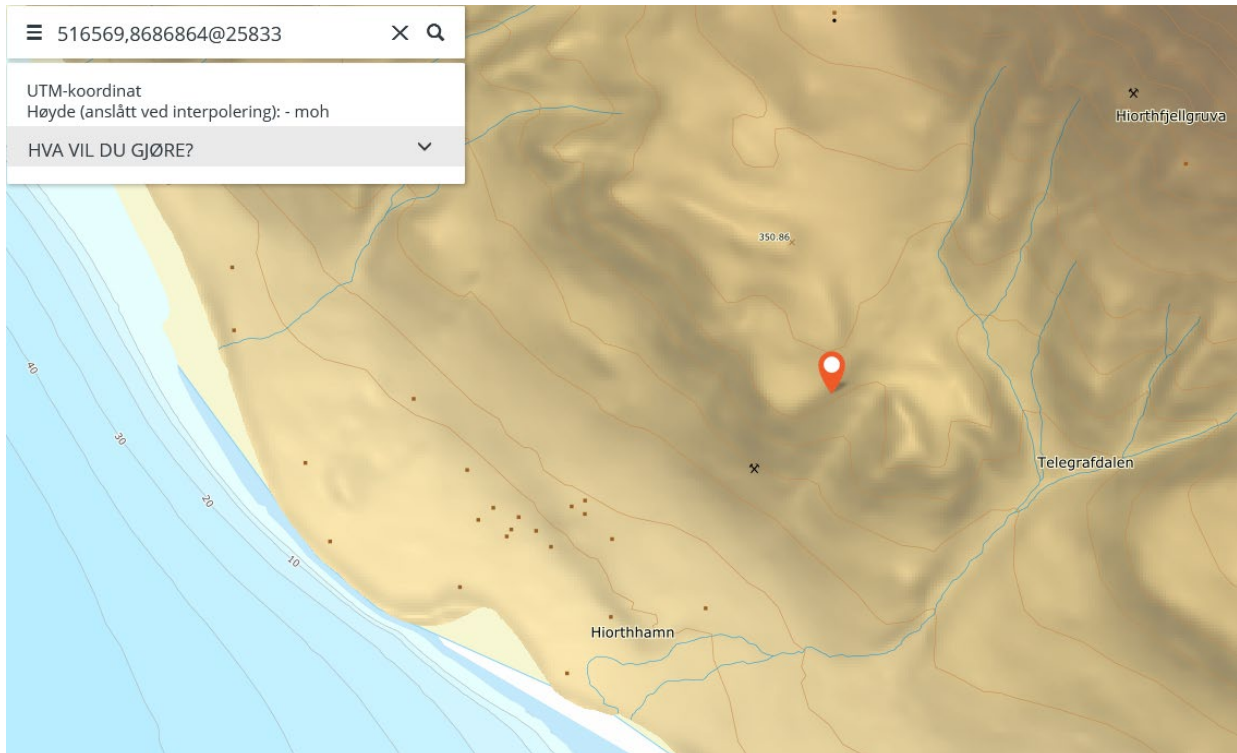
Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

3.22 Hiorthhamn, 93041 (no. 2 from Sneheim)

Askeladden ID	93041 (no. 2 from Sneheim)
Name locality	Cable car trestle no. 2 counted from Sneheim, in steep slope. No. 5 of the trestles still standing counted from the shore
Map coordinate	EU89 UTM-sone 33, 8686864 N 516569 E – approximate position. See map capture from norgeskart.no below.
Registered by	Johan, Gry, Nanna
Date of registration	27/7 2022
Type of object/construction	Cable car trestle



Overview photos – cardinal directions, overview of whole trestle



Not available

N

E



Not available

S

W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



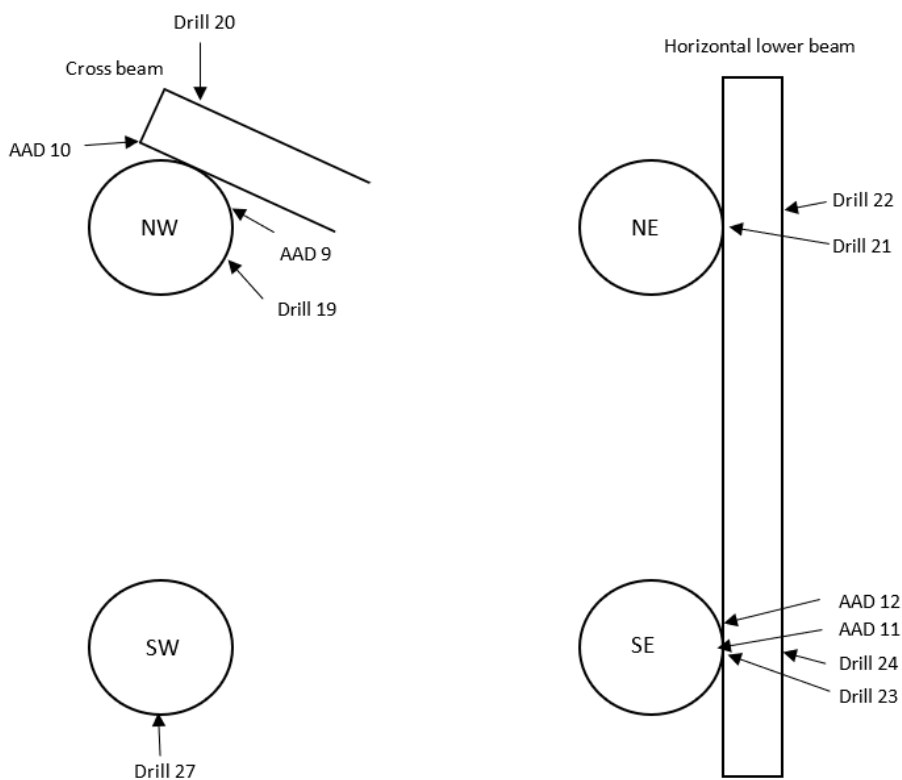
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 93041 (no. 2 from Sneheim)

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

The cable car trestle is located in very steep terrain and is not a threat for tourists and other visitors. Signs of possible decay in two of the legs (NW and SE). Structures further up seems to be in good conditions.

Photos before and after wood sampling:



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling

Not available



Leg NW, above ground, after sampling

Leg NW, above ground, before sampling



Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling

Not available

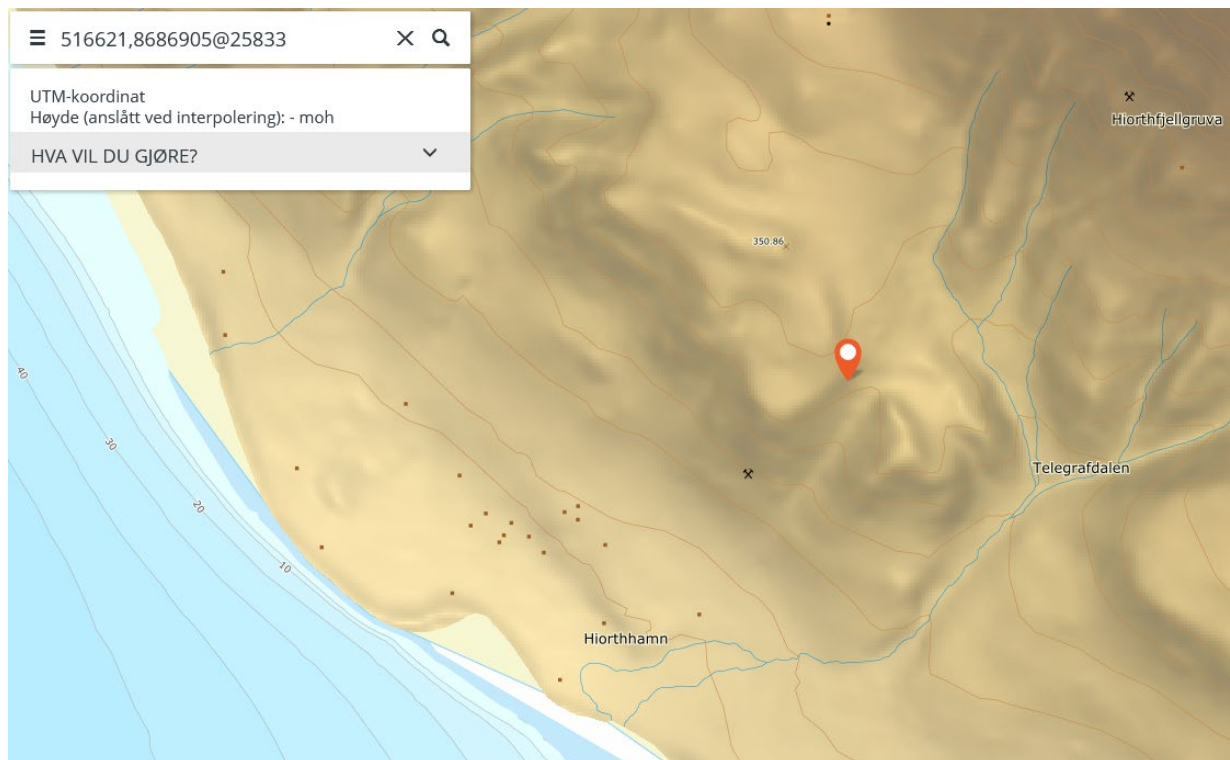


Leg SE, above ground, after sampling

Leg SE, above ground, before sampling

3.23 Hiorthhamn, 93041 (no. 1 from Sneheim)

Askeladden ID	93041 (no. 1 counted from Sneheim)
Locality	Cable car trestle 1 counted from Sneheim, on the brink of the Telegrafdalen valley. No. 6 of the trestles still standing counted from the shore
Map coordinates	EU89 UTM-sone 33, 8686905 N 516621 E – approximate position. See map capture from norgeskart.no below.
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	27/7 2022
Type of object/construction	Cable car trestle



Overview photos – cardinal directions, overview of whole trestle



N



E



S



W

Overview photos – overview of each leg. Taken from different directions depending on structure



NW



NE



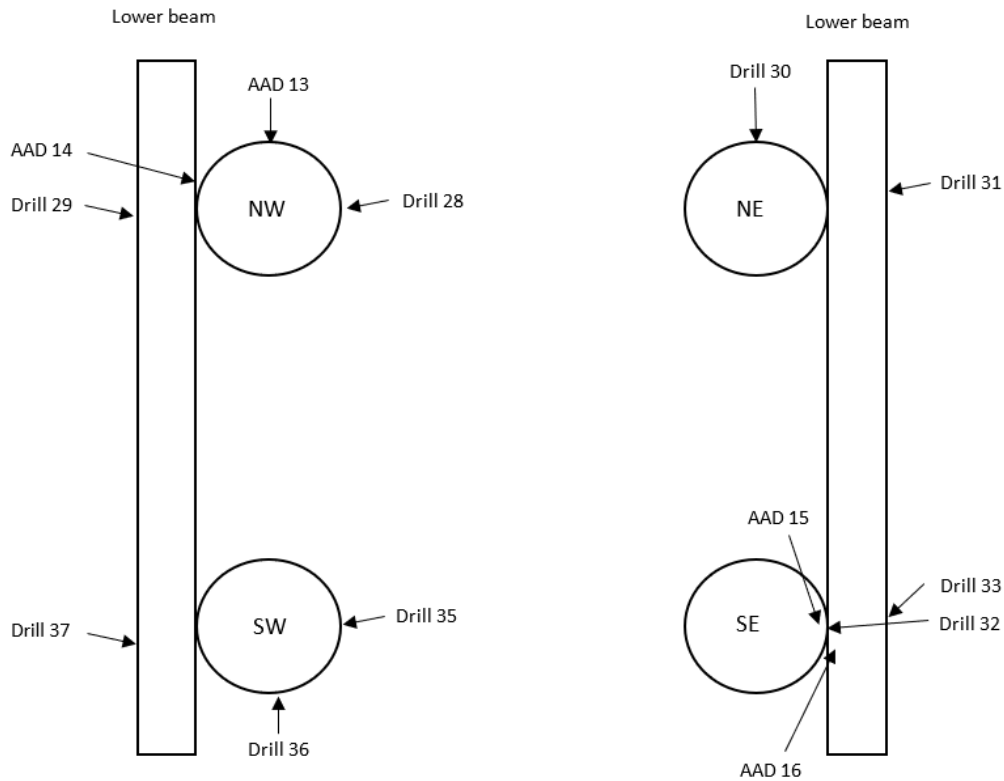
SW



SE

Schematic drawing/overview of examined timbers, cable car trestle 93041 (no. 1 from Sneheim)

The overview shows, seen from above, the position of decay detection drill performed in eight position and sampling of four wood samples (20 mm x 20 mm x 50 mm). Decay detection with slim awl was performed in the same eight positions as the decay detection drill.



Visual overview

The cable car trestle is located on the plane in front of the last slope before Sneheim. Signs of possible decay in all four legs. Structures further up seems to be in good conditions. It is assumed that this area is not frequently visited by tourists, but it is located close to the hiking trail.

Photos before and after wood sampling



Leg NW, soil contact, before sampling



Leg NW, soil contact, after sampling



Leg NW, above ground, before sampling



Leg NW, above ground, after sampling



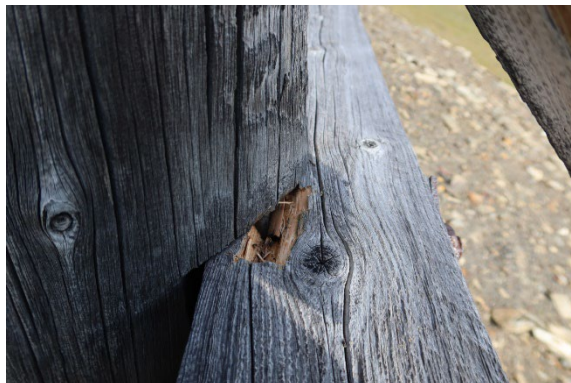
Leg SE, soil contact, before sampling



Leg SE, soil contact, after sampling



Leg SE, above ground, before sampling



Leg SE, above ground, after sampling

4 Documentation of sampling of buildings

4.1 Hiorthhamn, “Taubanestasjonen”, 93041-14

Askeladden ID	93041-14
Locality	Hiorthhamn
Map coordinate	EU89 UTM-sone 33, 8686184 N 515930 E
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	27/7 2022
Type of object/construction	Building



“Taubanestasjonen”, 93041-14. Overview east side. Point of sampling indicated



“Taubanestasjonen”, 93041-14. East side. Drilling, awl probing and sampling on beam beneath post, in the middle of the photo



“Taubanestasjonen”, 93041-14. East side. Drilling was done where the finger is pointing



"Taubanestasjonen", 93041-14. East side. Sample taken from wood in ground contact, directly below the point of drilling



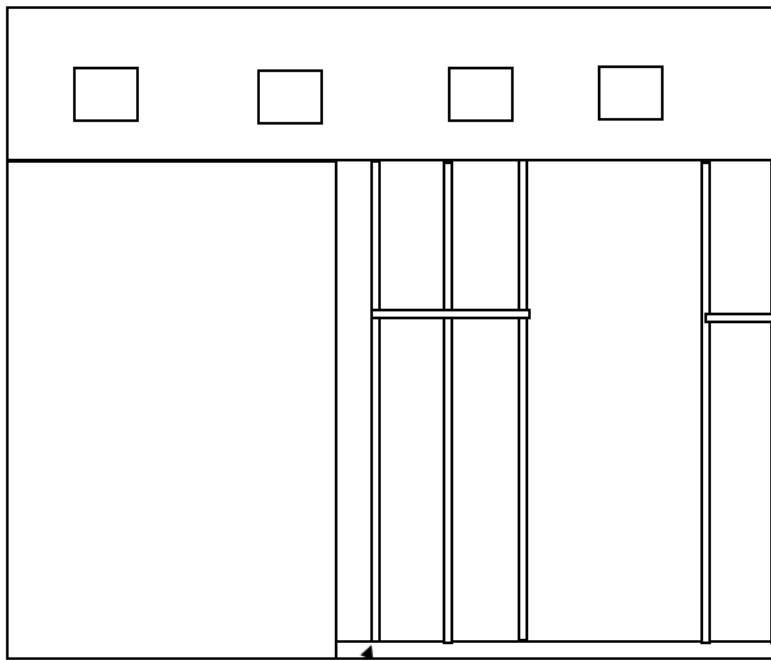
Photos from sampling "Taubanestasjonen", 93041-14. Overview of the west side. Points of awl probing indicated



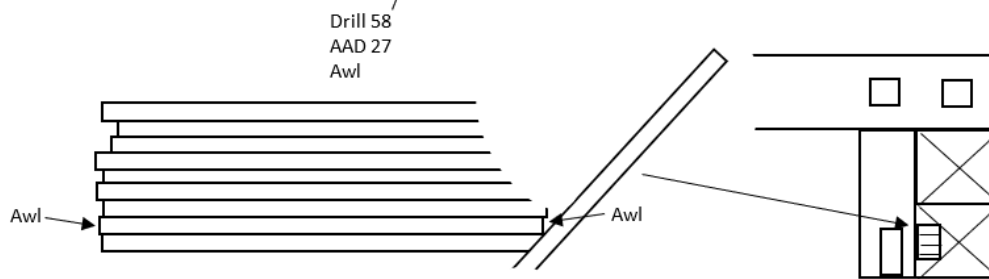
"Taubanestasjonen", 93041-14. West side, awl probing in end grain of boards covering window



"Taubanestasjonen", 93041-14. West side, awl probing



East side



Drill 58
AAD 27
Awl

West side

Illustration of sampling "Taubanesentralen", 93041-14

4.2 Hiorthhamn, “Telegrafen”, Building B, 146668-2

Askeladden ID	146668-2
Locality	Hiorthhamn
Map coordinate	EU89 UTM-sone 33, 8686566 N, 515807 E
Registered by	Mari, Gry
Date of registration	27/7 2022
Type of object/construction	Building



“Telegrafen”, overview west side. Awl probing points indicated



“Telegrafen”, west side. Awl probing in endgrain of weatherboard below window

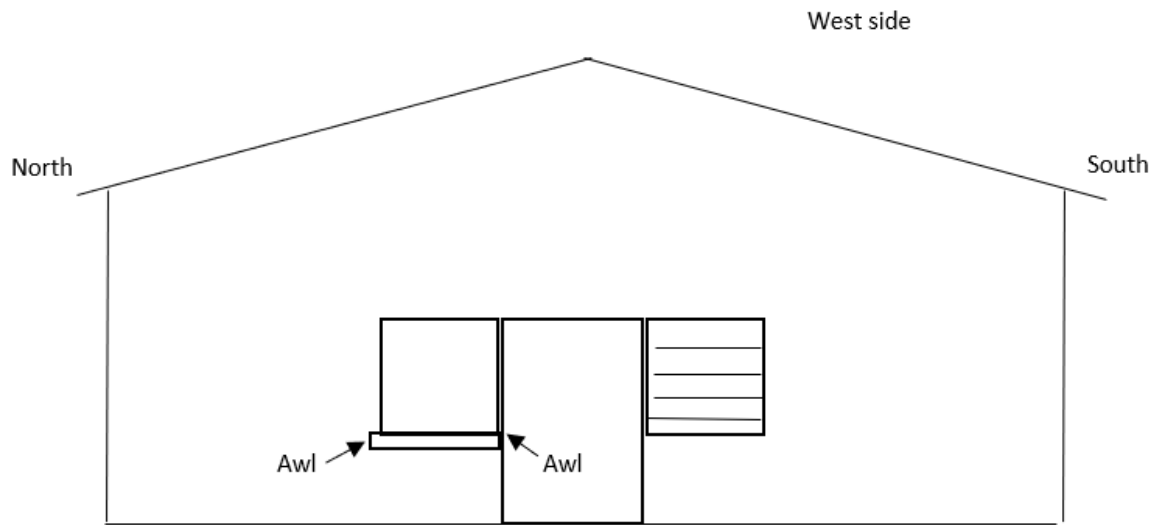


Illustration of sampling "Telegrafén", Building B, 146668-2

4.3 Hiorthhamn, “Gamlemessa”, Building E, 146668-5

Askeladden ID	146668-5
Locality	Hiorthhamn
Map coordinate	EU89 UTM-sone 33, 8686530 N, 515853 E
Registered by	Mari, Gry
Date of registration	27/7 2022
Type of object/construction	Building



“Gamlemessa”, overview of façade facing west. Points of awl probing indicated



“Gamlemessa”, western facing window. Awl probing in end grain of weatherboard below window

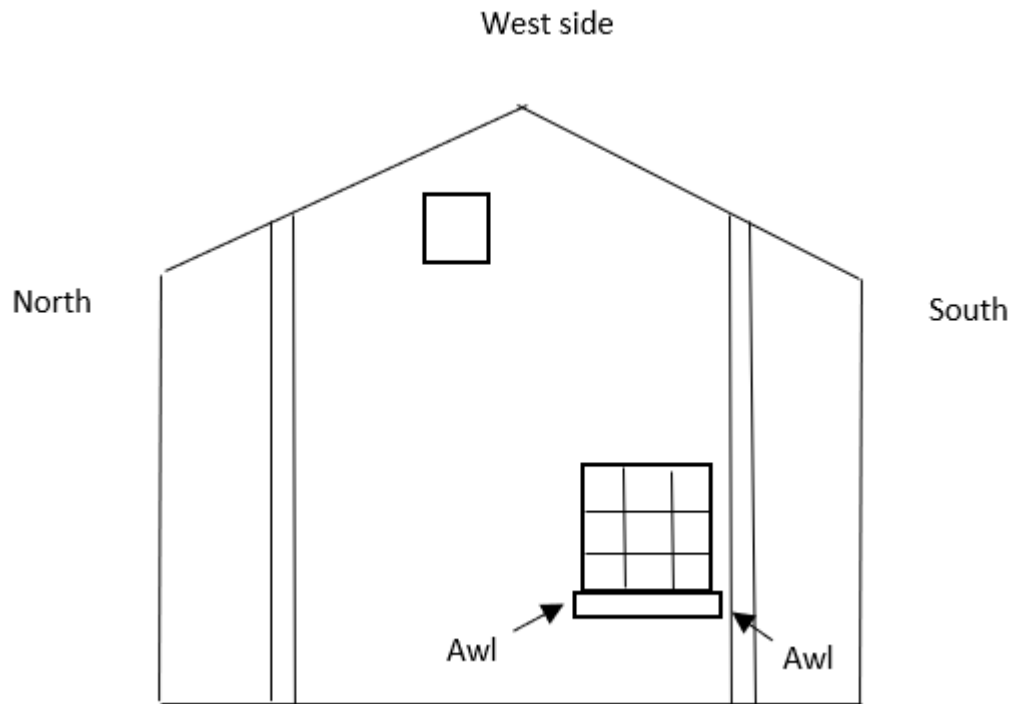


Illustration of sampling "Gamlemessa", Building E, 146668-5

4.4 Hiorthhamn, “Direktørboligen”, Building F, 146668-6

Askeladden ID	146668-6
Locality	Hiorthhamn
Map coordinate	EU89 UTM-sone 33, 8686589 N, 515940 E
Registered by	Mari, Johan, Gry, Lone, Nanna
Date of registration	27/7 2022
Type of object/construction	Building



“Direktørboligen”, façade facing west. Points of sampling/drilling/awl probing indicated



“Direktørboligen”, western facing side. Pile supporting bottom beam, before sampling. Point of drilling indicated



“Direktørboligen”, western facing side. Pile supporting bottom beam, after sampling



“Direktørboligen”, western facing side. Awl probing performed on end grain of weatherboard beneath main window



“Direktørboligen”, western facing side. Awl probing performed on end grain of weatherboard beneath main window



“Direktørboligen”, southwest corner. Awl probing performed on end grain of boards covering the corner



“Direktørboligen”, southwest corner. Awl probing performed on end grain of boards covering the corner

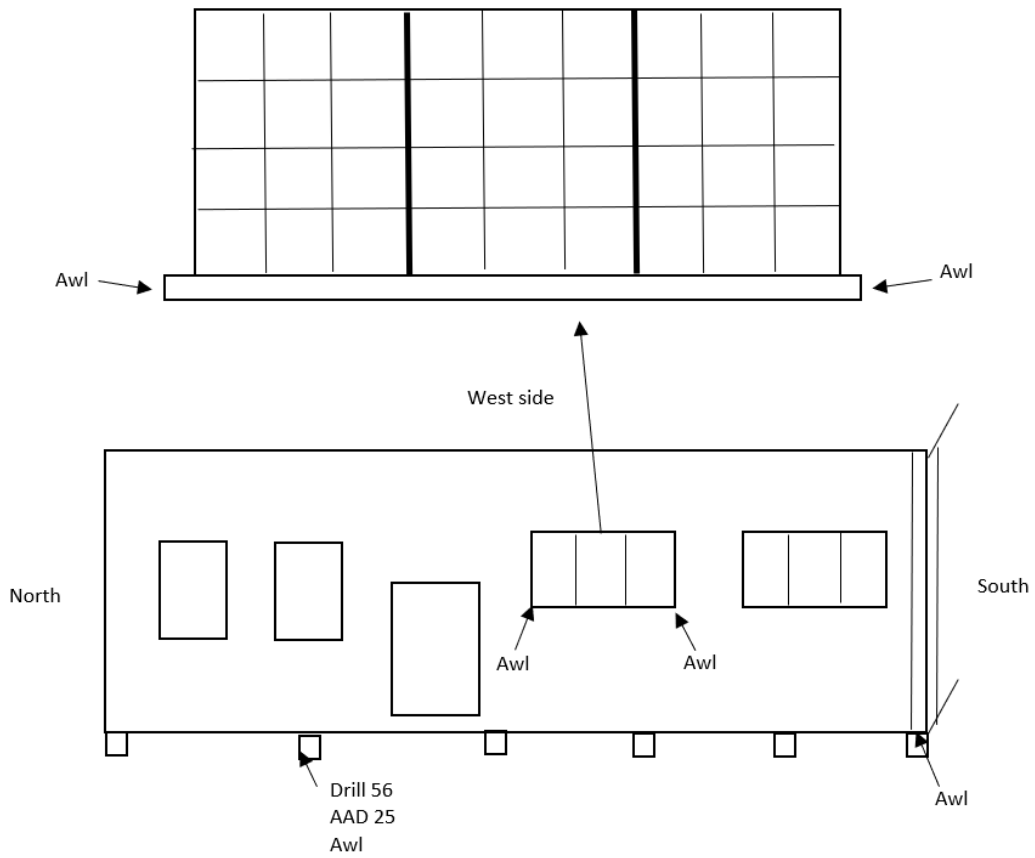


Illustration of sampling "Direktørboligen", Building F, 146668-6

4.5 Hiorthhamn, “Boligbrakke” Building G, 146668-7

Askeladden ID	146668-7
Locality	Hiorthhamn
Map coordinate	EU89 UTM-sone 33, 8686603 N, 515973 E
Registered by	Mari, Johan, Gry, Nanna
Date of registration	27/7 2022
Type of object/construction	Building



“Boligbrakke”, façade facing west. Points of sampling/drilling/awl probing indicated



“Boligbrakke”, northwestern corner, north, before sampling



“Boligbrakke”, northwestern corner, north, after sampling. Location of sample indicated



“Boligbrakke”, western facing side. Awl probing performed on end grain of weatherboard beneath southern window



“Boligbrakke”, western facing side. Awl probing performed on end grain of weatherboard beneath southern window



“Boligbrakke”, western facing side of covered porch. Awl probing performed on end grain of protruding board



“Boligbrakke”, western facing side of covered porch. Awl probing performed on end grain of protruding board

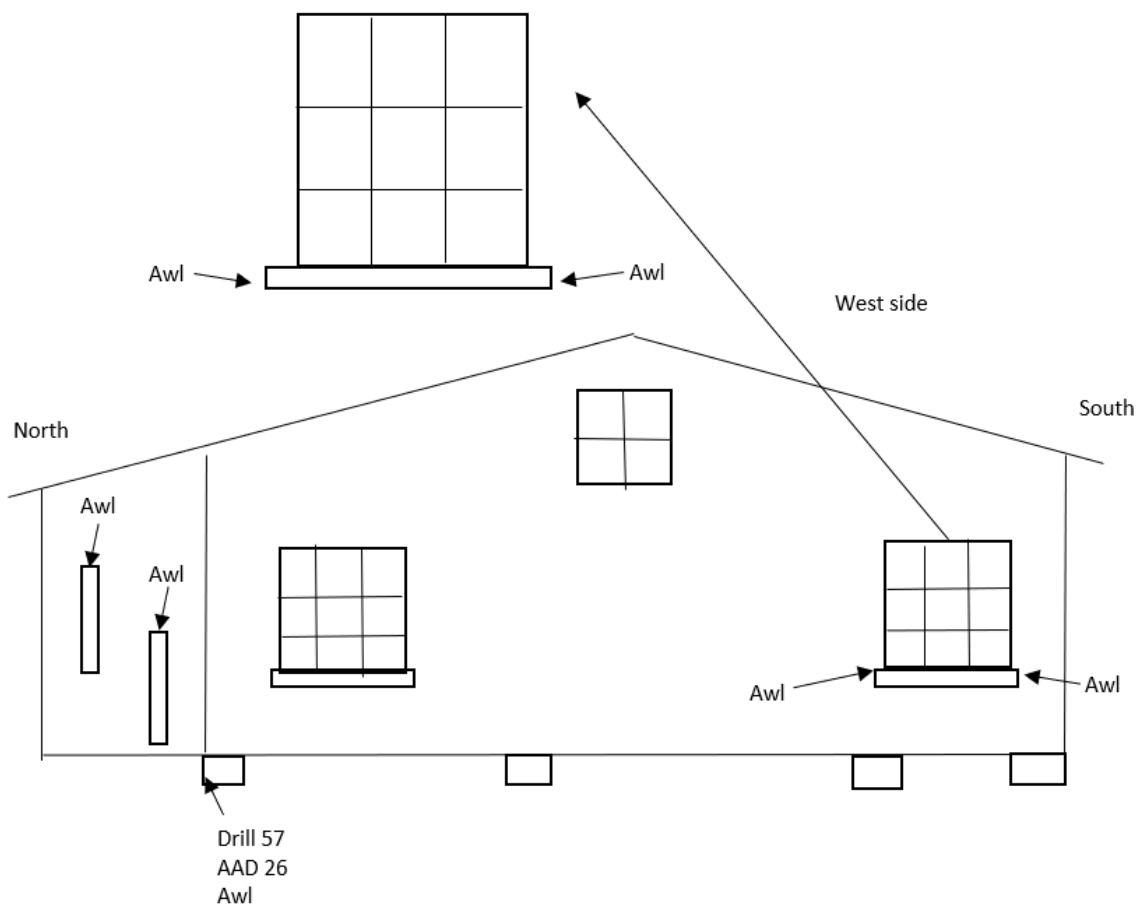
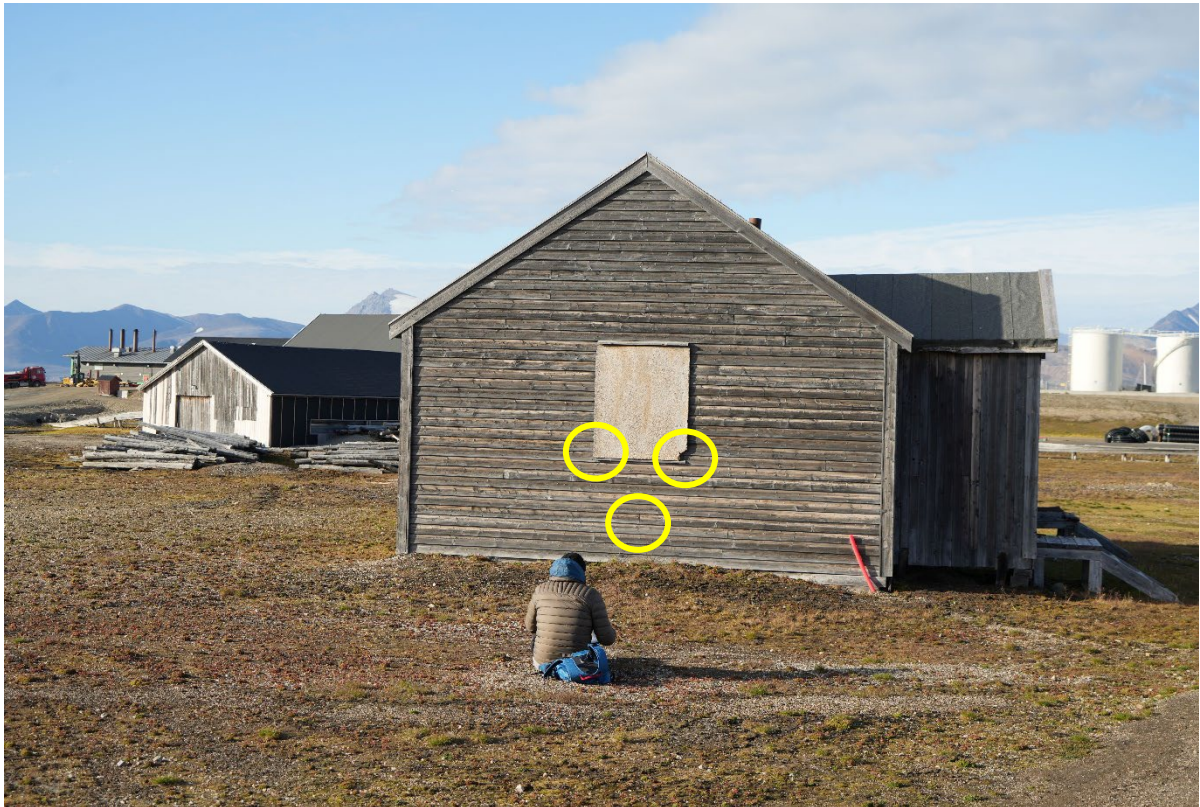


Illustration of sampling "Boligbrakke" Building G, 146668-7

4.6 Ny-Ålesund, “Sætra”, building 21, 159798-1

Askeladden ID	159798-1
Locality	Ny-Ålesund
Map coordinate	EU89 UTM-sone 33, 8763296 N, 434070 E
Registered by	Anne-Cathrine, Atle W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling “Sætra”, 159798-1



“Sætra”, façade facing south-west. Points of awl probing indicated



“Sætra”, south-west facing side. Awl probing performed on end grain of weatherboard beneath window.



“Sætra”, south-west facing side. Awl probing performed on end grain of panel board beneath window.

4.7 Ny-Ålesund, “Mexico”, building 26, 159782-1

Askeladden ID	159782-1
Locality	Ny-Ålesund
Map coordinate	EU89 UTM-sone 33, 8763221 N, 434052 E
Registered by	Anne-Cathrine, Atle W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling “Mexico”, 159782-1



“Mexico”, façade facing north-east. Awl probing taken from the façade facing south-west.



“Mexico”, façade facing south-west. Awl probing taken from window nr 4 from the corner, and from the panel underneath the window, next to the small stone.



“Mexico”, façade facing south-west. Points of awl probing indicated



“Mexico”, façade facing south-west. Awl probing performed on end grain of weatherboard beneath window



“Mexico”, façade facing south-west. Point of awl probing indicated

4.8 Ny-Ålesund, “Museumshytta”, building 9, 159761-1

Askeladden ID	159761-1
Locality	Ny-Ålesund
Map coordinate	EU89 UTM-sone 33, 8763359 N, 434150 E
Registered by	Anne-Cathrine, Atle W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling “Museumshytta”, 159761-1



“Museumshytta”, façade facing south-west. Points of awl probing indicated



“Museumshytta”, façade facing south-west. Points of awl probing indicated. Awl probing performed on end grain of weatherboards aside window



“Museumshytta”, façade facing south-west. Point of awl probing indicated

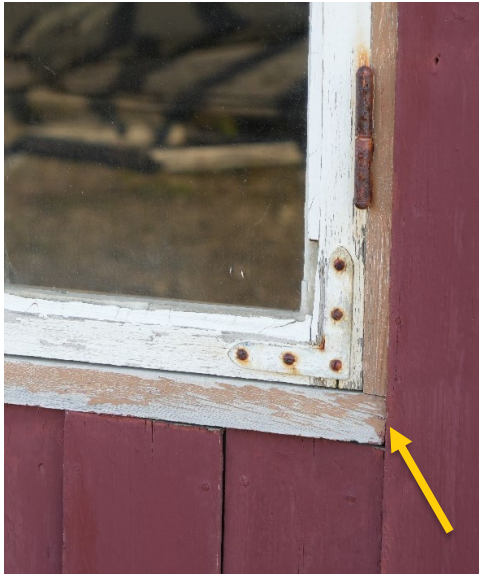
4.9 Ny-Ålesund, “Museum/Veteranhytta”, building 12, 159762-1

Askeladden ID	159762-1
Locality	Ny-Ålesund
Map coordinate	EU89 UTM-sone 33, 8763355 N, 434163 E
Registered by	Anne-Cathrine, Atle. W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling “Museum/Veteranhytta”, 159762-1



“Museum/Veteranhytta”, façade facing north-east. Only facadewith window. Points of awl probing indicated



“Museum/Veteranhytta”, façade facing north-east. Point of awl probing indicated. Awl probing performed on end grain towards north-west of weatherboard beneath window. Only accessibly end grain



“Museum/Veteranhytta”, façade facing north-east. Only facade with window. Points of awl probing indicated

4.10 Ny-Ålesund, Green Harbour, building 1, 159759-1

Askeladden ID	159759-1
Locality	Ny-Ålesund
Map coordinate	EU89 UTM-sone 33, 8763279 N, 434201 E
Registered by	Anne-Cathrine, Atle. W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling Green Harbour, 159759-1



Green Harbour, façade facing north-east. Only façade with window. Points of awl probing indicated



Green Harbour, window on façade facing north-east. Point of awl probing indicated. Awl probing performed on end grain towards north-west of weatherboard aside window



Green Harbour, façade facing north-east. Point of awl probing indicated. Awl probing performed on end grain of panel

4.11 London, Camp Mansfield, 139927-1

Askeladden ID	139927-1
Locality	London
Map coordinate	EU89 UTM-sone 33, 8767472 N, 436922 E
Registered by	Anne-Cathrine, Atle W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling Camp Mansfield, 139927-1



Camp Mansfield, façade facing south. Points of awl probing indicated



Camp Mansfield, façade facing south. Point of awl probing indicated. Awl probing performed on end grain of weatherboard beneath window



Camp Mansfield, façade facing west. Point of awl probing indicated. Awl probing performed on end grain of panel

4.12 London, “Velferden”/Camp Lagercrantz, 139927-13

Askeladden ID	139927-13
Locality	London
Map coordinate	EU89 UTM-sone 33, 8767491 N, 436933 E
Registered by	Anne-Cathrine, Atle W. Hegnes
Date of registration	2/8 2022
Type of object/construction	Building

Photos from sampling «Velferden»/Camp Lagercrantz, 139927-13



“Velferden”/Camp Lagercrantz, façade facing west. Points of awl probing indicated



“Velferden”/Camp Lagercrantz, façade facing west. Point of awl probing indicated. Awl probing performed on end grain of weatherboard beneath window



“Velferden”/Camp Lagercrantz, façade facing west. Point of awl probing indicated. Awl probing performed on end grain of panel

4.13 Longyearbyen, hotel Radisson Blu foundation piles

Askeladden ID	Not applicable since newer structures, not cultural heritage
Locality	Longyearbyen
Map coordinate	EU89 UTM-sone 33, 8683110 N, 5154726 E
Registered by	Mari, Johan, Gry, Nanna, Lone
Date of registration	2/8 2022
Type of object/construction	Foundation under building

Photos and illustrations from sampling foundation poles under the Radisson Blu hotel.



Hotel Radisson Blu, foundation pile SAS1. Overview from the inside



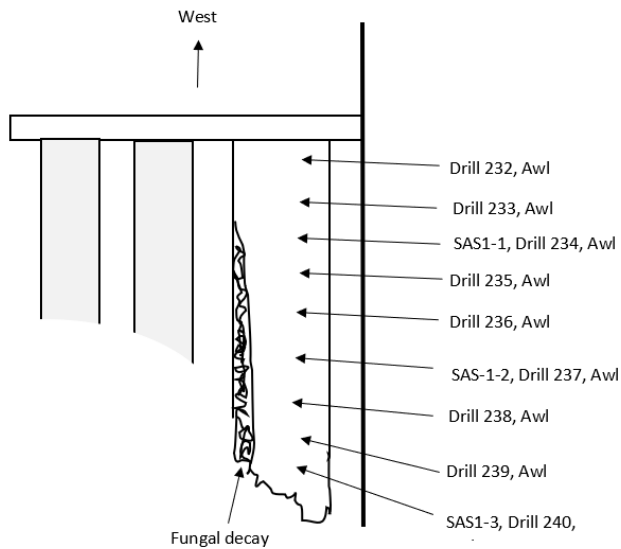
Hotel Radisson Blu, foundation pile SAS1. Decay detection drilling 233, 20 cm from beam



Hotel Radisson Blu, foundation pile SAS1. Cutting sample SAS1-2, 60 cm from beam



Hotel Radisson Blu, foundation pile SAS1. After cutting sample SAS1-1, 30 cm from beam



Sample location	Distance from beam
Drill 232, Awl	10 cm
Drill 233, Awl	20 cm
SAS1-1, Drill 234, Awl	30 cm
Drill 235, Awl	40 cm
Drill 236, Awl	50 cm
SAS1-2, Drill 237, Awl	60 cm
Drill 238, Awl	70 cm
Drill 239, Awl	80 cm
SAS1-3, Drill 240, Awl	90 cm

Illustration of data sampling of wooden pile SAS1 under hotel Radisson Blu



Hotel Radisson Blu, foundation pile SAS2



Hotel Radisson Blu, foundation pile SAS2. Decay detection drilling 244, cutting of sample SAS2-2



Hotel Radisson Blu, foundation pile SAS2. Probing with awl 40 cm from soil



Hotel Radisson Blu, foundation pile SAS2, after sampling

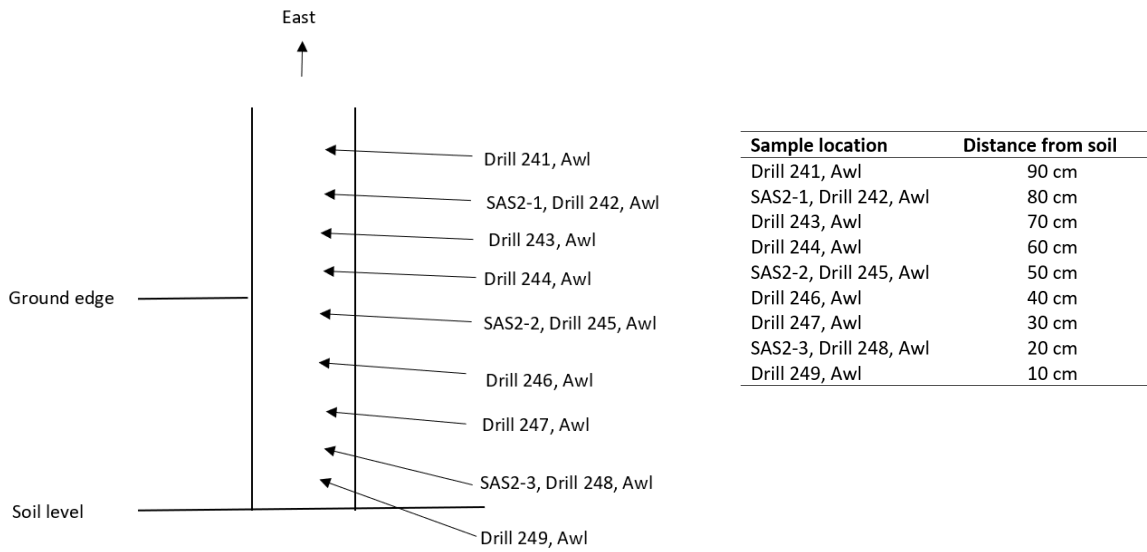
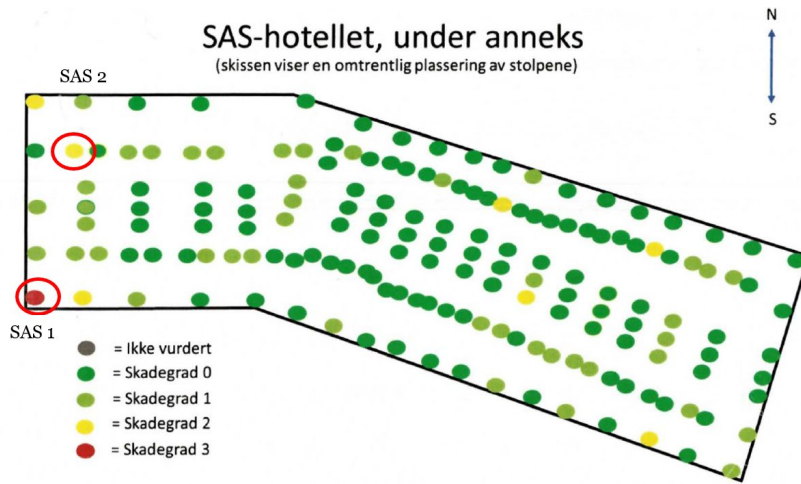


Illustration of data sampling of wooden piles under hotel Radisson Blu pole (SAS2)



The two wooden poles examined indicated in the map from Mattsson (2021)

4.14 Longyearbyen, guardrail, Burmaveien

Askeladden ID	Not applicable since newer structures, not cultural heritage
Locality	Longyearbyen along Burmaveien
Map coordinate	EU89 UTM-sone 33, 8683552 N, 513811 E
Registered by	Johan
Date of registration	14/9 2022
Type of object/construction	Guardrail

Photo from sampling of the guardrail along Burmaveien.

Eight samples in total were collected, in pole 16-23 counted from the bridge (counting from Longyearbyen in direction of the airport). Close to cable car trestle no. 5, Askeladden ID 158619-5.



Samples were taken from this pole (no. 16 from the bridge) plus in seven poles further

References

Mattsson, J. 2021. Survey of decay in wooden foundations under selected buildings in Longyearbyen. Internal report to the owner, Store Norske.

Syssemmannen på Svalbard. 2006. Hiorthhamn. Kulldrift under vanskelige forhold. Miljøvernnavdelingen.
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Syssemmannen på Svalbard. 2016. Ny-Ålesund. Verdens nordligste gruveby. Miljøvernnavdelingen.
<https://www.sysselmasteren.no/contentassets/225d990d15ff47a58050a1aa4948ed7b/ny---alesund-hefte>

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