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NATSUSHIMA “Cruise Report”

NT15-07

(Off Tohoku)

Apr.15th, 2015-Apr.26th, 2015

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

NT15-07 Cruise Report Contents

1. Cruise Information

● Cruise ID: NT15-07

● Name of vessel: Natsushima

●Title of the cruise: Investigation of earthquake recurrence and evaluation of stability of submarine bed off Tohoku

● Chief scientist [Affiliation]: Toshiya Kanamatsu [CEAT JAMSTEC]

● Representative of the Science Party [Affiliation]: Shuichi Kodaira [CEAT JAMSTEC]

○ Title of proposal

● Proposal1 representative [affiliation]: Shuichi Kodaira [CEAT JAMSTEC]

○ title:「Mega-earthquake and Tsunami in subduction trench: geological and geophysical researches for understanding of their mechanism

● Proposal2 representative [affiliation]: Shuro Yoshikawa [MAT]

○title:「Evaluation of bed stability estimated by shear strength of soils」

● Cruise period: Apr. 15th 2015 to Apr. 26th 2015（12days）

● Ports of departure / call / arrival Sendai/Sendai/Sumijyu Yokosuka

● Research area: off Tohoku

○ Research map **Fig. 1-1**

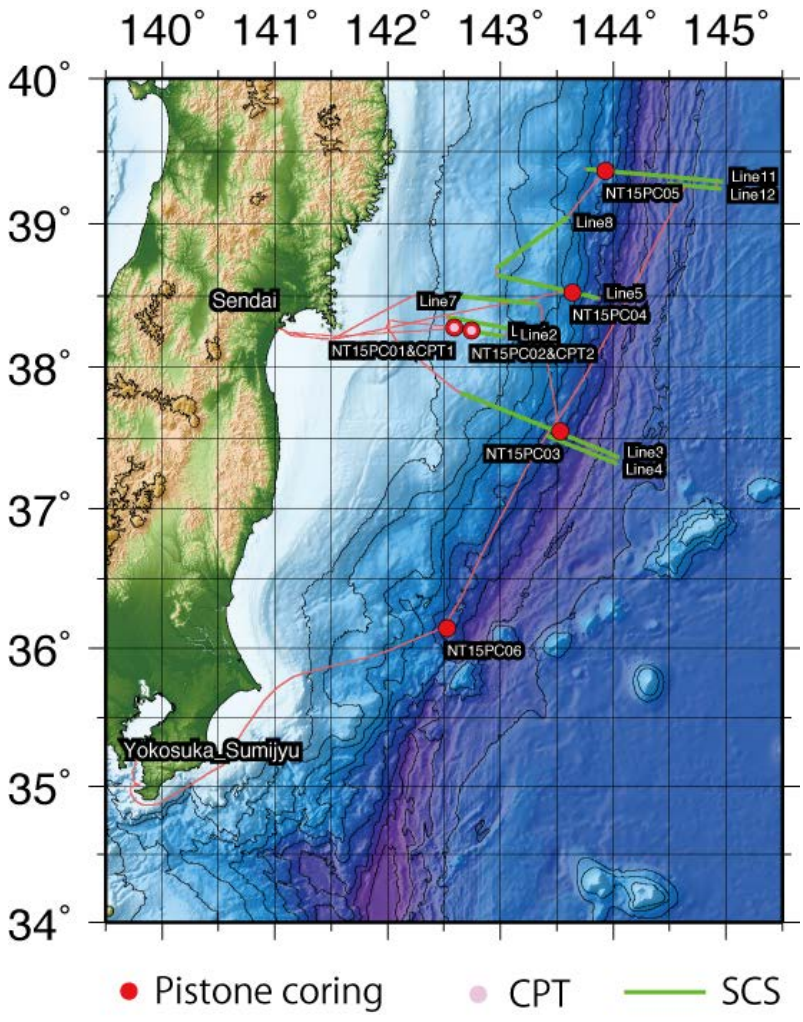


Fig. 1-1. Ship track and working positions of NT15-07

2. Participant list

Scientific party

Toshiya Kanamatsu	CEAT, JAMSTC
Toshiya Fujiwara	CEAT, JAMSTC
Kazuno Arai	CEAT, JAMSTC
Shuro Yoshikawa	MAT, JAMSTC
Mitsuteru Kuno	Nippon Marine Enterprise
Takuya Onodera	Nippon Marine Enterprise
Toshikatsu Nasu	Nippon Marine Enterprise
Satsuki Iijima	Nippon Marine Enterprise
Yusuke Sato	Marine Works Japan Ltd
Yasushi Hashimoto	Marine Works Japan Ltd
Mika Yamaguchi	Marine Works Japan Ltd
Keiko Fujino	Marine Works Japan Ltd

R/V Natsushima Ship Crew

Captain	Eiko Ukekura
Chief Officer	Takaaki Shishikura
2nd Officer	Shozo Fujii
3rd Officer	Tomoaki Yukawa
Chief Engineer	Tadashi Abe
1st Engineer	Yoshinobu Hiratsuka
2nd Engineer	Kenichi Shirakata
3rd Engineer	Kazuki Ono
Chief Electronics Operator	Yohei Yamamoto
2nd Electronics Operator	Hiroki Ishiwata
3rd Electronics Operator	Takayuki Mabara
Boat Swain	Hatsuo Oda
Able Seaman	Shuichi Yamamoto
Able Seaman	Hiroaki Nagai
Able Seaman	Yoshiaki Matsuo
Able Seaman	Toru Nakanishi
Sailor	Yasunobu Kawabe
Sailor	Toshiya Saga
No.1 Oiler	Keita Funawatari
Oiler	Masaki Tanaka
Oiler	Eiji Aratake
Oiler	Shotaro Sumitomo
Oiler	Daiki Sato
Chief Steward	Toyonori Shiraishi
Steward	Shinsuke Tanaka
Steward	Akio Suzuki
Steward	Oyu Shinobu
Steward	Koichiro Kashiwagi

3. Cruise Log

Date	Local Time	Note	Description	Position/Weather/ Wind/Sea condition
15-Apr-15		**Postponement of leaving port**		4/15 12:00(UTC+9h)
	10:00	Took a lecture about Life in Ship.		SENDAISHIOGAMA
	13:00	Practiced boat station drill.		
16-Apr-15		**Let go all shore lines & left SENDAISHIOGAMA for Research Area.**		4/1612:00(UTC+9h)
	08:30	Let go all shore lines & left SENDAISHIOGAMA for Research Area.		OFF KINKA-SAN
	14:45	Arrived at Research Area.		38-14.0N, 141-52.0E
	14:56	Released XBT.	Depth=1162m	Fine but cloudy
	15:32	Hoisted up CPT (Cone Penetration Testing) at P3.		East 1(Light air)
	16:31	CPT on the sea bottom.	Depth=1300m(1st)	2(Calm)
	17:36	CPT on the sea bottom. (On the 10th try)		1(No swell)
	17:39	winded up the CPT.		Visibly:8
	18:10	Recovered CPT & proceeded to Research Area(P4).		
	19:02	Carried out CPT (Cone Penetration Testing) at P4.		
	19:59	CPT on the sea bottom.	Depth=1400m(1st)	
	21:12	CPT on the sea bottom. (On the 10th try)		
	21:46	Recovered CPT.		
	21:55-22:08	Launched GI gun & Carried out the test shot.		
	22:09-22:15	Veered put streamer cable.		
	22:24-25:50	Com'ced SCS(Single Channel Seismic profiler) survey Line1_0.		
17-Apr-15		**Carried out PC (Piston corer) at P3 & P4. SCS Survey Line1_1.**		4/1712:00(UTC+9h)
	03:05-09:18	Com'ced SCS survey Line2.		CONTINENTAL SLOPE OF OFF TOHOKU
	09:19-09:26	Recovered Streamer cable.		38-16.5N, 142-35.5E

	09:26-09:35	Recovered GIgun proceeded to Research Area(P3).		Mist
	10:19	Carried out PC(Piston Corer) at P3.		North-3(Gentle breeze)
	11:12	PC on the sea bottom.	Depth=1308m	2(Calm)
	11:56	Recovered PC & proceeded to Research Area(P4).		1(No swell)
	12:51	Carried out PC at P4.		Visibly:1
	13:43	PC on the sea bottom.	Depth=1403m	
	14:25	Recovered PC.		
	14:37-14:47	Launched GI gun & Carried out the test shot.		
	14:44-14:48	Veered out streamer cable.		
	14:50-17:12	Com'ced SCS survey Line1_1.		
	17:14-17:20	Recovered Streamer cable.		
	17:21-17:25	Recovered GI gun.		
18-Apr-15		**SCS Survey Line3.**		4/18 12:00(UTC+9h)
	06:01-06:07	Launched GI gun & Carried out the test shot.		OFF TOHOKU
	06:09-06:11	Veered put streamer cable.		37-40.0N, 143-06.0E
	06:21-23:21	Com'ced SCS survey Line3.		Fine but cloudy
				SW-6(Strong breeze) / 3(Sea smooth) /
				1(Low swell sea) / Visibly:8
19-Apr-15		**SCS Survey Line4 & Line7. Carried out PC at NT15plan04.**		4/19 12:00(UTC+9h)
	00:47-05:13	Com'ced SCS survey Line4.		OFF TOHOKU
	05:52	Released XBT.		37-33.0N, 143-32.0E
	06:00	Carried out PC at NT15plan04.		Cloudy
	09:07	PC landed on the sea bottom.	Depth=6135m	WSW-3(Gentle breeze)
	11:55	Recovered PC & proceeded to Research Area(Line7).		2(Calm)
	16:20	Released XBT.		1(Low swell sea)
	16:28-16:34	Launched GI gun & Carried out the test shot.		Visibly:8
	16:36-16:39	Veered out streamer cable.		
	17:20-	Com'ced SCS survey Line7.		

20-Apr-15		**SCS survey Line7& Proceeded to SENDAISHIOGAMA.**		4/20 12:00(UTC+9h)
	04:54	Finished SCS survey Line7.		SENDAISHIOGAMA
	05:01-05:10	Recovered streamer cable.		38-16.3N, 141-01.1E
	05:04-05:09	Recovered GI gun.		Overcast
	05:15	Proceeded to SENDAISHIOGAMA.		NW-2(Light breeze)
	11:00	Arrived at SENDAISHIOGAMA.		1(Calm)
				1(Law swell sea)
				Visibly:5
21-Apr-15		**Proceeded to Research Area.**		4/21 12:00(UTC+9h)
	14:30	Proceeded to Research Area.		PORT OF SHIOGAMA
				38-16.3N, 141-01.1E
				Fine but cloudy
				NNW-4 (Moderate breeze) /1 (Calm)/ 1(Low aswell sea)/ Visibly:8
22-Apr-15		**Carried out PC at NT15plan28_b. SCS survey Line5&Line8**		4/22 12:00(UTC+9)
	01:30	Arrived at OFF TOHOKU.		OFF TOHOKU
	05:42	Released XBT.		38-30.0N, 143-46.0E
	06:01	Carried out PC at NT15plan28_b.		Fine but cloudy
	07:54	PC on the sea bottom.		SSW-3(Gentle breeze)
	09:34	Recovered PC.		2(Sea smooth)
	10:34-10:37	Launched GI gun & Carried out the test shot.		1(Law swell sea)
	10:37-10:40	Veered up streamer cable.		Visibly:8
	10:53-21:06	Com'ced SCS survey Line5.		
	21:44-	Com'ced SCS survey Line8.		
23-Apr-15		**Carried out PC at 40b. SCS survey Line11.**		4/23 12:00(UTC+9)
	06:22-06:28	Recovered streamer cable.		OFF TOHOKU
	06:29-06:36	Recovered GI gun.		39-22.0N,

				143-56.0E
	08:25	Released XBT.	Depth=4,826m	Fine but cloudy
	08:31	Carried out PC at 40b.		SSW-2(Light breeze)
	10:46	PC on the sea bottom.		1(Calm)
	12:50	Recovered PC.		1(Law swell sea)
	13:30-13:38	Launched GI gun		Visibly:5
	13:38-13:40	Carried out the test shot & Veered put streamer cable.		
	13:50-	Com'ced SCS survey Line11 & Line12.		
24-Apr-15		**Finished SCS survey.**		4/24 12:00(UTC+9)
	5:00	SCS survey Line11 & Line12.(Finished SCS suvey.)		OFF TOHOKU
	05:02-05:09	Recovered GI gun.		38-17.0N, 143-59.0E
	05:10-05:16	Recovered streamer cable & Proceeded to Research Area (NT15plan09).		Fine but cloudy
	13:30	On board Seminar.		SSE-6(Strong breeze)
				3(Sea slight) /1(Law swell sea)/ Visibly:8
25-Apr-15		**Carried out PC at NT15plan9.**		4/25 12:00(UTC+9)
	02:00	Arrived at Research Area (NT15plan09).		OFF INUBOUSAKI
	04:09	Released XBT.		36-03.0N, 142-10.0E
	04:33	Carried out PC(Piston Corer) at NT15plan09.		cloudy
	10:20	Recovered PC.		NNE-6(Strong breeze)
	10:30	Proceeded to Sumitomo Heavy Industry,Ltd.		3(Sea slight) / 1(Law swell sea)/ Visibly:8
26-Apr-15		**Arrived at Sumitomo Heavy Industry, Ltd. & Disembark.**		
	09:00	Arrived at Sumitomo Heavy Industry,Ltd. & Disembark.		

4. Objectives and summary of observation

4-1.Objectives

Paleoseismology:

After the 2011 off the Pacific coast of Tohoku Earthquake, we have intensively explored earthquake or tsunami induced records in the deep-sea basins close to the rupture zones of 2011 and past earthquakes in Tohoku. One of the places to be explored in Japan Trench is small basins developing in a lower slope terrace. The most characteristic morphological feature in the slope of Japan Trench is a long elongated terrace parallel to the trench axis with 4000-5000 water depth: Mid slope terrace (MST) [Cadet et al., 1987a], located between an upper slope and a lower slope has gentle slope as only 2° [von Huene and Lallemand , 1990]. One of the main objectives was to begin to understand the sedimentation in this area that had not been previously cored except for Deep Sea Drilling Leg 56 and 57. Previous studies have documented active faults that cross the mid-slope terrace [Kawamura et al., 2012, Tsuji et al., 2013]. MST contains many small basins, which may capture mass transport deposits induced by earthquakes from an up-slope. An investigation on such surface sediment in these basins, therefore, will provide an opportunity for determining recurrence of earthquakes in Tohoku. In order to characterize the sediment deposited in these basins, we planed a piston coring campaign within the planed working area. In the meantime, to understand a long depositional history and search any structural evidences for past earthquakes under seafloor.

Single-channel Seismic Survey:

We carried out the single-channel seismic (SCS) survey to clarify the complex structure of the upper plate at the subduction zone in the Tohoku-oki Japan Trench area. We aimed to reveal the high-resolution subsurface structure around the piston coring and cone penetration testing (CPT) sites.

We also tried to examine the performance of the JAMSTEC SCS survey system in this locality condition, because there is no scientific or technical report of previous survey using the system in this area. Therefore, some track lines were laid out on the same lines of previous multi-channel seismic (MCS) surveys (Arai et al., 2014; Tsuru et al., 2002). By comparison with the previous seismic profiles, evaluation of structural change caused by the 2011 Tohoku-oki earthquake will be possible.

Cone Penetration Testing:

An examination of the shear strength of submarine deposits is important for research on seafloor stability, and for generation of submarine landslide and turbidity current. In addition, the shear strength is essential information for construction of submarine platform that operates extraction of submarine

resource. To examine the strength in broad offshore area, development of a device that can easily measure the in-situ shear strength of the deposits is necessary. In this cruise, cone penetration testing (CPT) had conducted in 16 April 2015 at two sites, to examine data of the CPT system with a pressure gauge and an acceleration sensor that measure the condition of the penetration into the seafloor, and to advance the operation of the system on deep seafloor. Furthermore, to calibrate the CPT data, sediment cores were sampled in the same sites.

4-2. Overview of Observations

NT15-07 was planed for conducting two themes above mentioned during 15th-26th Apr. (Sendai-Yokosuka). Unfortunately our cruise was terminated on 15th, 20th, and 21st due to waiting on weather. But two CPT, seven Piston coring and nine lines of SCS observations could be completed during the cruise (**Fig. 1-1**). Our achievements are summarized as followings. 1) CPT operations were conducted to obtain geotechnical data in two sites with repeating penetrations, and two piston cores were recovered from the same sites to measure shear strengths of sediment directly onboard. 2) Three cores were recovered from MST, and one core from the outer ridge. Intercalating of frequent sandy layers, which are probably evidences for paleo-tsunami or paleo-earthquakes, and a few tephra layers are observed. 3) SCS observations recognized unique underground strata-structures in the forearc basins and on the subducting seafloor. Acoustic images of sedimentary structures in range of 0.3-0.4 sec are acquired.

5-1. Cone Penetration Testing

To develop a device that can measures the shear strength of deep sea deposits, a cone penetration testing (CPT) had conducted at two sites in water depths of about 1300 m and 1400 m off the Tohoku region in 16 April 2015. The general design and image of the survey system is illustrated in **Fig. 5-1**. The CPT probe was placed in tip of the rod. The present CPT system also has a pressure gauge that obtains accurate elevation (water depth) change of the system. In addition, to measure the vertical and horizontal acceleration during the penetration of the CPT probe into the seafloor, an acceleration sensor was equipped. The sampling frequencies of the value of the penetration resistance by CPT were 20 KHz for the first survey site, and 50 KHz for the second site. The frequency of both of the data by pressure gauge and acceleration sensor were 100 KHz. These additional data were recorded in a logger, and CPT data was in the probe. At each survey site, CPT was conducted ten times. A transponder that was equipped with the wire approx. 50 m above the CPT system was used for calculation of the elevation of the underwater system during the operations. In addition, to calibrate the CPT data, sediment cores were sampled in both sites.

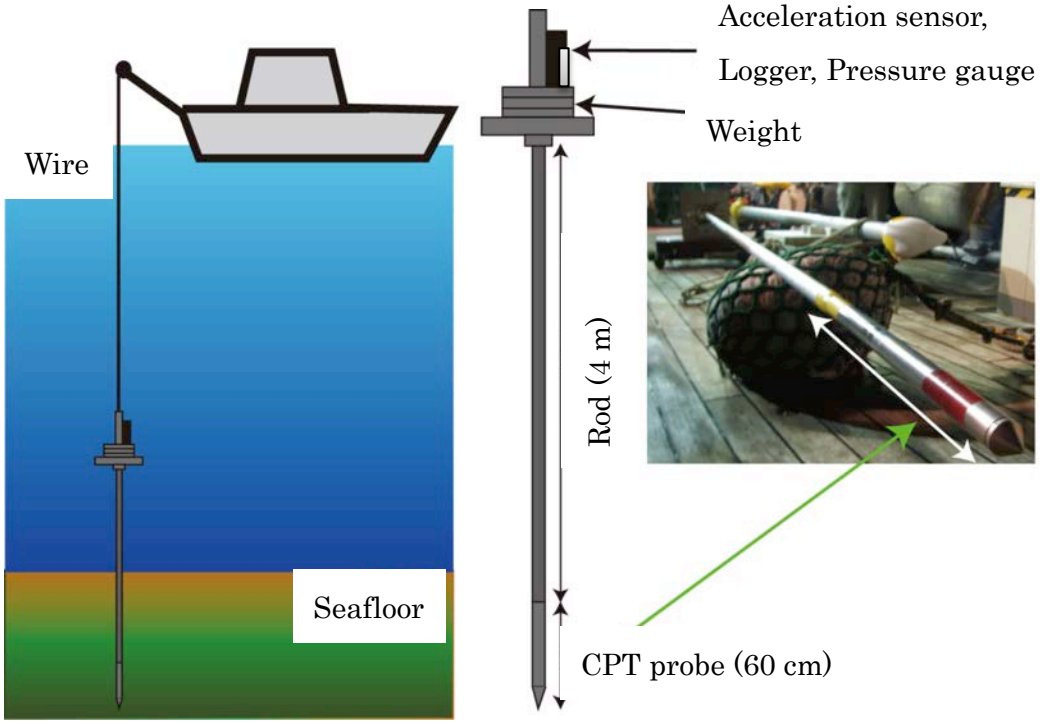


Fig. 5-1. Illustration of the survey by a cone penetration testing (CPT) system

5-2. Piston corer system and its operation (MWJ)

Piston corer system (PC)

Piston corer system consists of 0.59 ton weight, 6 m or 8 m long stainless steel barrel with PVC liner tube and a pilot corer (**Fig.5-2)**. Piston: Brass body type was used. Piston is composing of an O-ring (size: P63). The inside diameter (I.D.) of PVC liner tube is 75 mm. The total weight of the system is approximately 0.9 ton. The pipe length was chose based on site survey data. For a pilot corer, we used a "74 mm diameter long-type pilot corer". The transponder (Benthos ltd. XT-6001-10; max depth 6,700 m or OKI ltd. SB-1018; max depth 6,200 m) was attached to the winch wire above 50 m or 500 m from the PC to monitor the PC position.

Winch operation

When we started lowering PC, a speed of wire out was set to be 20 m/min, and then gradually increased to the maximum of 50 m/min. Lowering was stopped at a depth about 100 m above the seafloor. 5 minutes were spent to reduce some pendulum motion of the system. After stabilizing the corer motion, the wire was wound out again at a speed of 20 m/min. When the corers touched the bottom, the wire tension abruptly decreased by the loss of the corer weight. Immediately after confirmation that the corers hit the bottom, wire out was stopped and winding of the wire was started at a speed of 20 m/min, until the tension gauge indicates that the corers were lifted off the bottom. After left the bottom, winch wire was wound in at the maximum speed.

Core splitting

The sediment sections are longitudinally cut into working and archive halves by a splitting devise and a nylon line.

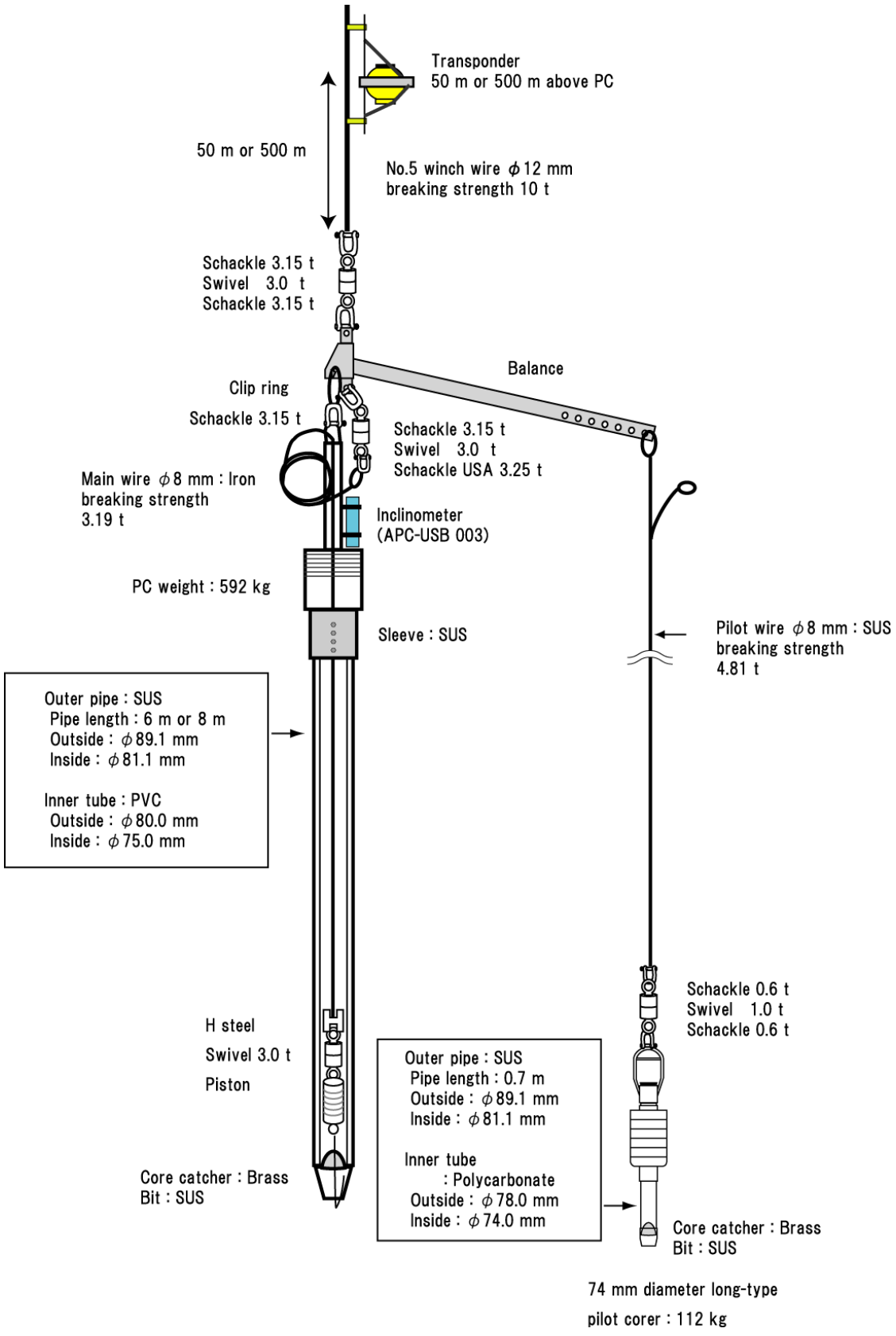


Fig. 5-2. piston corer system

5-3 Single Channel Seismic Equipment and Survey Specification

The single channel seismic survey equipment and specification is as follows. The offset diagram of SCS for this cruise is shown in **Fig. 5-3.**

Streamer	
Manufacturer	S.I.G
Active section length	65m
Hydrophone Interval	1m
Type of Hydrophone	S.I.G.16
Hydrophone output	-90 dB,re 1V/μbar,±1dB
Frequency	flat from 10Hz to 1000Hz
Depth sensor	Yes
Preamplifier	gain 39 dB
Lead in cable length	85m
Receiver depth	2.8m (Line1_0) 3.1m (Line2) 3.4m(Line8,Line11) 3.5m(Line5) 3.7m (Line1_1,Line7) 3.9m(Line12) 4.0m(Line4) 4.2m (Line3_0)
Source	
Manufacturer	Sersel
Type of airgun	GI Gun
Volume	【150cu.in (G:45cu.in,I:105cu.in)】 Line1_0,Line1_1,Line2,Line5,Line7,Line8 【210cu.in (G:105cu.in,I:105cu.in)】 Line3,Line4,Line11,Line12
Air pressure	12.2MPa (Line1_0,Line1_1,Line2) 13.0MPa(Lin5,Line8,Line11) 13.2MPa (Line3,Line4,Line7,Line12)
Source depth	2.0m
Depth sensor	No
Gun Controller	Hotshot ver.3.300
Air Compressor	
Manufacture	Service Engineering co., ltd.
Type of machine	4SA30-A150K
Air supply Capacity	2.0m^3/min.
Recording System	
Manufacturer	GEOMETRICS
Type of system	Geode ver.9.28.0.0
Recording format	SEG-D 8058 Rev.1
Recording Length	6,500msec(Line7) 7,000msec(Line1_0,Line1_1,Line2) 8,000msec(Line8) 10,800msec(Line5) 11,500msec(Line12) 12,500msec(Line3,Line4,Line11)
Water Delay	0m

Sample rate	1msec
High cut filter	None
Low cut filter	None
Recording media	Hard Disk
GPS System	
Manufacturer	Fugro
Type of system	SkyFix XP MultiFix6
DGPS Reference Station	Multi Reference Station (ALL)
Navigation System	
Manufacturer	MARIMEX JAPAN
Type of system	Nav log ver.1.2.1
Shot Point Geometry	
Time mode shooting	10.0sec(Line1_0,Line1_1,Line2) 11.0sec(Line5,Line7,Line8) 15.0sec(Line3,Line4,Line11,Line12)
Geodetic Parameter	
Spheroid	WGS84
Semi-major Axis	6,378,137m
Inverse Flattening	298.26
Projection	U.T.M
	Zone54

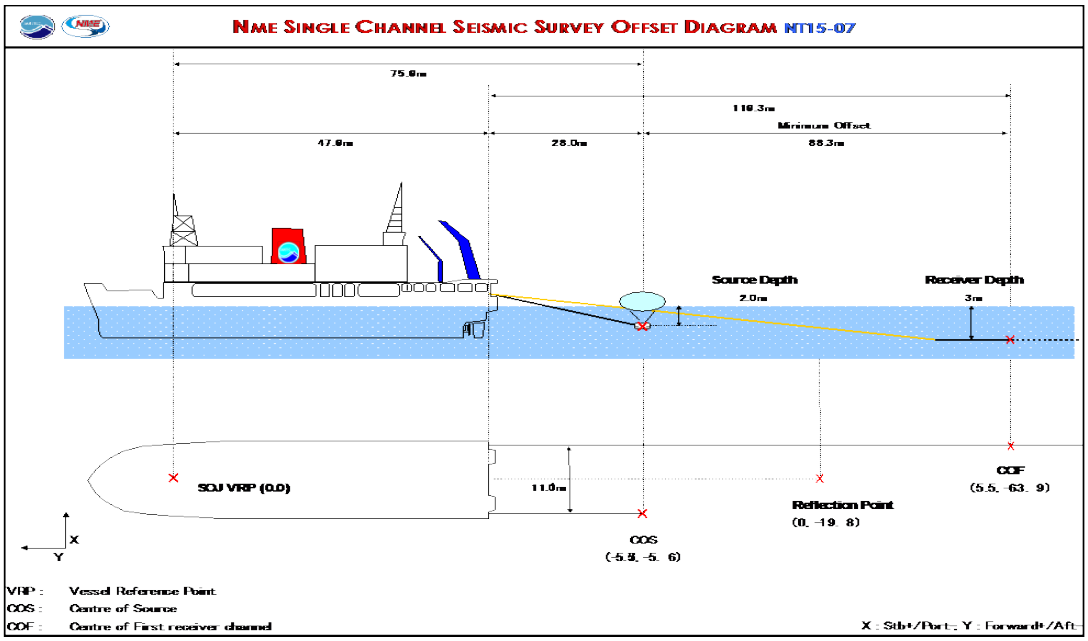


Fig. 5-3. The offset diagram of SCS for this cruise.

6. Observations

6-1 SCS data Collection

A GI gun with air-pressure of ~13 MPa was used for a seismic source. A chamber size of 150 cu in. (Generator: 45 cu in., Injector: 105 cu in.) was chosen to generate higher frequency seismic signal. A larger chamber size of 210 cu in. (Generator: 105 cu in., Injector: 105 cu in.) was used in consideration of great water depths over 6000 m. The GI gun was towed 30 m behind the ship and towing depth was ~2 m. A streamer, which consists of a 65 m active section with 48 hydrophones and an 85 m lead-in cable, was towed behind the ship. Towing depth of the streamer was ~3-4 m. Survey ship speed was ~4 knots, and shots were fired at a time spacing of 11 seconds (~23 m spacing) or 15 seconds (~30 m spacing). General information for each line are summarized in **Table 6-1-2.** See Section "**5-3 Single Channel Seismic Equipment and Survey Specification"** for NT15-07 for detailed description about the JAMSTEC SCS survey system.

Nine SCS track lines, a total survey of ~638 km (~345 nautical miles), were completed (**Fig. 6-1-1**). See **Table 6-1-1** "Single Channel Seismic Survey Line List NT15-07" for detailed information of the track lines. The track lines are extensively distributed from the landward upper trench slope to the seaward trench slope through the trench axis. Line-1 was laid out along the previous JAMSTEC MCS line MY102 acquired in 1999 and also TH03 in 2011 after the Tohoku-oki earthquake. Line-2 was designed to run along the same track of Geological Survey of Japan (GSJ) KR070506 conducted in 2007. Line-3 is situated on GSJ KR070507, Line-4 is on JAMSTEC MY103, and Line-7 is on GSJ KR070505 lines, respectively.

Table 6-1-1 Single Channel Seismic Survey Line List NT15-07

NME SINGLE CHANNEL SEISMIC SURVEY LINE LIST NT15-07

Line No.	Date (UTC)	Time (UTC)	Passing Point	Shot No.	Vessel Position				Length [m]	Direction [deg]
					Lat.		Lon.			
Line1_0	2015/4/16	13:24:39	F.S.P	1001	38-15.60905	N	142-42.86133	E	27,115	98.8
	2015/4/16	13:31:55	F.G.S.P	1044	38-15.61020	N	142-43.49579	E		
	2015/4/16	16:50:40	L.G.S.P	2221	38-13.06000	N	143-01.23962	E		
	2015/4/16	16:50:40	L.S.P	2221	38-13.06000	N	143-01.23962	E		
Line2	2015/4/16	18:09:20	F.S.P	2687	38-16.11053	N	143-05.93811	E	63,403	279.4
	2015/4/16	18:09:20	F.G.S.P	2687	38-16.11053	N	143-05.93811	E		
	2015/4/17	00:18:32	L.G.S.P	4873	38-21.10748	N	142-32.02332	E		
	2015/4/17	00:18:32	L.S.P	4873	38-21.10748	N	142-32.02332	E		
Line1_1	2015/4/17	05:50:39	F.S.P	1001	38-15.43991	N	142-44.73724	E	18,799	278.6
	2015/4/17	05:50:39	F.G.S.P	1001	38-15.43991	N	142-44.73724	E		
	2015/4/17	08:12:46	L.G.S.P	1842	38-17.13707	N	142-31.99402	E		
	2015/4/17	08:12:46	L.S.P	1842	38-17.13707	N	142-31.99402	E		
Line3	2015/4/17	21:21:45	F.S.P	1001	37-49.64836	N	142-38.39905	E	129,670	111.0
	2015/4/17	21:47:29	F.G.S.P	1103	37-48.75046	N	142-40.39124	E		
	2015/4/18	14:21:02	L.G.S.P	5041	37-22.92320	N	144-00.01465	E		
	2015/4/18	14:21:02	L.S.P	5041	37-22.92320	N	144-00.01465	E		
Line4	2015/4/18	15:07:13	F.S.P	5224	37-20.15236	N	143-58.99567	E	39,923	290.3
	2015/4/18	15:07:13	F.G.S.P	5224	37-20.15236	N	143-58.99567	E		
	2015/4/18	20:13:14	L.G.S.P	6429	37-28.22296	N	143-33.86719	E		
	2015/4/18	20:13:14	L.S.P	6429	37-28.22296	N	143-33.86719	E		
Line7	2015/4/19	08:20:21	F.S.P	1001	38-26.73706	N	143-19.38171	E	89,917	274.0
	2015/4/19	08:23:31	F.G.S.P	1018	38-26.76315	N	143-19.09973	E		
	2015/4/19	19:54:02	L.G.S.P	4738	38-31.15036	N	142-17.68341	E		
	2015/4/19	19:54:02	L.S.P	4738	38-31.15036	N	142-17.68341	E		
Line5	2015/4/22	1:53:55	F.S.P	1001	38-29.04167	N	143-52.17316	E	80,525	281.3
	2015/4/22	1:53:55	F.G.S.P	1001	38-29.04167	N	143-52.17316	E		
	2015/4/22	12:06:11	L.G.S.P	4295	38-38.68469	N	142-57.98584	E		
	2015/4/22	12:06:11	L.S.P	4295	38-38.68469	N	142-57.98584	E		
Line8_0	2015/4/22	12:44:32	F.S.P	1001	38-41.65787	N	142-58.10852	E	67,551	52.8
	2015/4/22	12:44:32	F.G.S.P	1001	38-41.65787	N	142-58.10852	E		
	2015/4/22	21:21:10	L.G.S.P	3778	39-03.06862	N	143-36.07178	E		

	2015/4/22	21:21:10	L.S.P	3778	39-03.06862	N	143-36.07178	E		
Line11	2015/4/23	04:50:25	F.S.P	1001	39-22.72087	N	143-45.33875	E	101,054	93.1
	2015/4/23	04:50:25	F.G.S.P	1001	39-22.72087	N	143-45.33875	E		
	2015/4/23	17:06:36	L.G.S.P	3919	39-17.72072	N	144-55.56793	E		
	2015/4/23	17:06:36	L.S.P	3919	39-17.72072	N	144-55.56793	E		
Line12	2015/4/23	17:52:15	F.S.P	1001	39-14.84734	N	144-53.76801	E	20,469	273.1
	2015/4/23	17:52:15	F.G.S.P	1001	39-14.84734	N	144-53.76801	E		
	2015/4/23	20:00:00	L.G.S.P	1507	39-15.91438	N	144-39.55902	E		
	2015/4/23	20:00:00	L.S.P	1507	39-15.91438	N	144-39.55902	E		

Table 6-1-2. General information for each survey line.

NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

NT15-07

GENERAL

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line1_0			
DIRECTION (°)	98.8			
DATE	2015/4/16			
WEATHER	Fine but cloudy			
WIND	East, Light breeze			
SEA CONDITION	Smooth			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1044	FF No.	1044
	N		38-15.61020	
	E		142-43.49579	
	Time (UTC)		13:31:55	
	Water Depth (m)		1384.0	
LAST SHOT POINT	SP No.	2221	FF No.	2221
LAST GOOD SHOT POINT	SP No.	2221	FF No.	2221
	N		38-13.06000	
	E		143-01.23962	
	Time (UTC)		16:50:40	
	Water Depth (m)		1662.0	

SOURCE

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	10 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	150 cu.in
CONFIGURATION	Generator:45 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	12.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

RECEIVER

RECEIVER TYPE	SIG Streamer
HYDROPHONE	SLG.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	2.8m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

RECORDING

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	7,000 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

DATA

SEISMIC DATA	1001.sgd - 2221.sgd(1221 Files)
	(Folder name : Line1_0)
NAVIGATION DATA	Line1_0_Shot.csv
	Line1_0_LOG.csv

REMARKS

SHIP SPEED AGAINST GROUND : 4.3knot
SHIP SPEED AGAINST WATER : 4.3knot

Air gun waveform was not synchronizing because HOTSHOT setting was mistake.(FF1001-1019)

After SP1020(FF1020), Air gun waveform synchronized, and this point is most close to Line1_1 First shot point

SP1125, FF1125 : Most close to point of P4

SP1220, FF1220 : Way Point (W6)
SP1450, FF1450 : Way Point (W5)
SP1671, FF1671 : Way Point (W4)
SP1889, FF1889 : Way Point (W3)
SP2113, FF2113 : Way Point (W2)
SP2219, FF2219 : Way Point (W1)

PROCESSING

Static Correction	-96.8msec
Band Pass Filter	5-20_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	None
FX Filter	Filter adaptation=60%

OBSERVER

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

NT15-07

GENERAL

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line2			
DIRECTION (°)	279.4			
DATE	2015/4/16-4/17			
WEATHER	Fog			
WIND	NE, Gentle breeze			
SEA CONDITION	Smooth			
FIRST SHOT POINT	SP No.	2687	FF No.	2687
FIRST GOOD SHOT POINT	SP No.	2687	FF No.	2687
	N		38-16.11053	
	E		143-05.93811	
	Time (UTC)		18:09:20	
	Water Depth (m)		1799.0	
LAST SHOT POINT	SP No.	4873	FF No.	4873
LAST GOOD SHOT POINT	SP No.	4873	FF No.	4873
	N		38-21.10748	
	E		142-32.02332	
	Time (UTC)		0:18:32	
	Water Depth (m)		1220.0	

SOURCE

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	10 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	150 cu.in
CONFIGURATION	Generator:45 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	12.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

RECEIVER

RECEIVER TYPE	SIG Streamer
HYDROPHONE	SLG.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.1m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

RECORDING

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	7,000 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

DATA

SEISMIC DATA	2687.sgd - 4873.sgd(2187 Files)
	(Folder name : Line2)
NAVIGATION DATA	Line2_Shot.csv
	Line2_LOG.csv

REMARKS

SHIP SPEED AGAINST GROUND : 4.4knot
SHIP SPEED AGAINST WATER : 4.3knot

SP2687, FF2687 : Way Point (W5)
SP3227, FF3227 : Way Point (W4)
SP3765, FF3765 : Way Point (W3)
SP4310, FF4310 : Way Point (W2)
SP4870, FF4870 : Way Point (W1)

PROCESSING

Static Correction	-96.7msec
Band Pass Filter	20-25_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	None
FX Filter	Filter adaptation=70%

OBSERVER

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

NT15-07

GENERAL

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line1_1			
DIRECTION (°)	278.6			
DATE	2015/4/17			
WEATHER	Mist			
WIND	NW, Fresh breeze			
SEA CONDITION	Moderate			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001
	N		38-15.43991	
	E		142-44.73724E	
	Time (UTC)		5:50:39	
	Water Depth (m)		1376.0	
LAST SHOT POINT	SP No.	1842	FF No.	1841
LAST GOOD SHOT POINT	SP No.	1842	FF No.	1841
	N		38-17.13707	
	E		142-31.99402	
	Time (UTC)		8:12:46	
	Water Depth (m)		1159.0	

SOURCE

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	10 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	150 cu.in
CONFIGURATION	Generator:45 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	12.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

RECEIVER

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.7m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

RECORDING

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	7,000 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

DATA

SEISMIC DATA	1001.sgd - 1841.sgd(841 Files)
	(Folder name : Line1_1)
NAVIGATION DATA	Line1_1_Shot.csv
	Line1_1_LOG.csv

REMARKS

SHIP SPEED AGAINST GROUND : 4.3knot
SHIP SPEED AGAINST WATER : 3.8knot

SP1086 is close to first good shot point(SP.1044) of Line1_0.

SP1381, NAVLOG couldn't sent trigger because system error. Due to this, 1 data was lost in navigation log file and 1 count differencial occurred in SP and FF No. .
(FF No. was few than 1 count)

SP1366, FF1366 : Way Point (W7)
SP1575, FF1574 : Way Point (W8)
SP1842, FF1841 : Way Point (W9)

PROCESSING

Static Correction	-96.8msec
Band Pass Filter	15-20_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	None
FX Filter	Filter adaptation=60%

OBSERVER

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

NT15-07

GENERAL

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line3			
DIRECTION (°)	110.0			
DATE	2015/4/17-18			
WEATHER	Fine but cloudy			
WIND	SW, Strong breeze			
SEA CONDITION	Moderate			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1103	FF No.	1103
	N		37-48.75046	
	E		142-40.39124	
	Time (UTC)		21:47:29	
	Water Depth (m)		1309.0	
LAST SHOT POINT	SP No.	5041	FF No.	5041
LAST GOOD SHOT POINT	SP No.	5041	FF No.	5041
	N		37-22.92320	
	E		144-00.01465	
	Time (UTC)		14:21:02	
	Water Depth (m)		6515.0	

SOURCE

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	15 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	210 cu.in
CONFIGURATION	Generator:105 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

RECEIVER

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	4.2m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

RECORDING

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	12,500 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

DATA

SEISMIC DATA	1001.sgd - 5041.sgd(4041 Files)
	(Folder name : Line3)
NAVIGATION DATA	Line3_Shot.csv
	Line3_LOG.csv

REMARKS

SHIP SPEED AGAINST GROUND : 4.1knot
SHIP SPEED AGAINST WATER : 4.3knot

SP3648, FF3648 : Close to NT15plan04

SP1040, FF1040 : Way Point Way1
SP1421, FF1421 : Way Point Way2
SP1799, FF1799 : Way Point Way3
SP2174, FF2174 : Way Point Way4
SP2565, FF2565 : Way Point Way5
SP2956, FF2956 : Way Point Way6
SP3348, FF3348 : Way Point Way7
SP3767, FF3767 : Way Point Way8
SP4160, FF4160 : Way Point Way9
SP4555, FF4555 : Way Point Way10
SP4869, FF4869 : Way Point Way11
SP5041, FF5041 : Way Point Way12

PROCESSING

Static Correction	-95.9msec
Band Pass Filter	15-20_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	1460
FX Filter	Filter adaptation=60%

OBSERVER

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME Single Channel Seismic Survey General Information

NT15-07

General

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line4			
DIRECTION (°)	290.1			
DATE	2015/4/18			
WEATHER	Cloudy			
WIND	West, Light breeze			
SEA CONDITION	Smooth			
FIRST SHOT POINT	SP No.	5224	FF No.	5224
FIRST GOOD SHOT POINT	SP No.	5224	FF No.	5224
	N		37-20.15236	
	E		143-58.99567	
	Time (UTC)		15:07:13	
	Water Depth (m)		6524.0	
LAST SHOT POINT	SP No.	6429	FF No.	6427
LAST GOOD SHOT POINT	SP No.	6429	FF No.	6427
	N		37-28.22296	
	E		143-33.86719	
	Time (UTC)		20:13:14	
	Water Depth (m)		6584.0	

Source

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	15 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	210 cu.in
CONFIGURATION	Generator:105 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

Receiver

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	4.0m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

Recording

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	12,500 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

Data

SEISMIC DATA	5224.sgd - 6427.sgd(1204 Files)
	(Folder name : Line4)
NAVIGATION DATA	Line4_Shot.csv
	Line4_LOG.csv

Remarks

SHIP SPEED AGAINST GROUND : 4.3knot
SHIP SPEED AGAINST WATER : 3.4knot

SP5228-5229, NAVLOG couldn't sent trigger because opened NAVLOG Shot Log file.
Due to this, 2 data was lost in navigation log file and 2 count differencial occurred in SP and FF No. .
(FF No. was few than 2 count)

SP5224, FF5224 : Way Point Way1'
SP5372, FF5370 : Way Point Way2'
SP5676, FF5674 : Way Point Way3'
SP5977, FF5975 : Way Point Way4'
SP6130, FF6128 : Way Point Way1
SP6279, FF6277 : Way Point Way2
SP6429, FF6427 : Way Point Way3

Processing

Static Correction	-96.0msec
Band Pass Filter	25-30_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	1460
FX Filter	Filter adaptation=60%

Observer

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME Single Channel Seismic Survey General Information

NT15-07

General

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line5			
DIRECTION (°)	281.2			
DATE	2015/4/22			
WEATHER	Fine but cloudy			
WIND	SSW Fresh breeze			
SEA CONDITION	Slight			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001
	N		38-29.04167	
	E		143-52.17316	
	Time (UTC)		1:53:55	
	Water Depth (m)		5809.0	
LAST SHOT POINT	SP No.	4295	FF No.	4295
LAST GOOD SHOT POINT	SP No.	4295	FF No.	4295
	N		38-38.68469	
	E		142-57.98584	
	Time (UTC)		12:06:11	
	Water Depth (m)		1682.0	

Source

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	11 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	150 cu.in
CONFIGURATION	Generator:45 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.0MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

Receiver

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.5m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

Recording

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	10,800 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

Data

SEISMIC DATA	1001.sgd - 4295.sgd(3295 Files)
	(Folder name : Line5)
NAVIGATION DATA	Line5_Shot.csv
	Line5_LOG.csv

Remarks

SHIP SPEED AGAINST GROUND : 4.3knot
SHIP SPEED AGAINST WATER : 4.6knot

SP1015, FF1015 : Way Point W10
SP1419, FF1419 : Way Point W9
SP1821, FF1821 : Way Point W8 (28b)
SP2226, FF2226 : Way Point W7
SP2632, FF2632 : Way Point W6
SP3045, FF3045 : Way Point W5
SP3463 FF3463 : Way Point W4
SP3874, FF3874 : Way Point W3
SP4287, FF4287 : Way Point W2

Processing

Static Correction	-96.3msec
Band Pass Filter	15-20_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	1460
FX Filter	Filter adaptation=60%

Observer

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME Single Channel Seismic Survey General Information

NT15-07

General

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line7			
DIRECTION (°)	274.1			
DATE	2015/4/19			
WEATHER	Cloudy			
WIND	East, Moderate breeze			
SEA CONDITION	Smooth			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1018	FF No.	1015
	N		38-26.76315	
	E		143-19.09973	
	Time (UTC)		8:23:31	
	Water Depth (m)		2492.0	
LAST SHOT POINT	SP No.	4738	FF No.	4735
LAST GOOD SHOT POINT	SP No.	4738	FF No.	4735
	N		38-31.15036	
	E		142-17.68341	
	Time (UTC)		19:54:02	
	Water Depth (m)		752.0	

Source

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	11 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	150 cu.in
CONFIGURATION	Generator:45 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

Receiver

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.7m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

Recording

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	6,500 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

Data

SEISMIC DATA	1001.sgd - 4735.sgd(3735 Files)
	(Folder name : Line7)
NAVIGATION DATA	Line7_Shot.csv
	Line7_LOG.csv

Remarks

SHIP SPEED AGAINST GROUND : 4.2knot
SHIP SPEED AGAINST WATER : 4.2knot

Seismic data interval (from FF1014 to FF1015) was 44seconds because Geode system setting trouble.
Due to this, 3 counts differencial occurred in SP and FF No. .
(FF No. was few than 3 counts)

SP1026, FF1023 : Way Point (W8)
SP1271, FF1268 : Way Point (W7)
SP1783, FF1781 : Way Point (W6)
SP2304, FF2301 : Way Point (W5)
SP2828, FF2825 : Way Point (W4)
SP3339, FF3336 : Way Point (W3)
SP3592, FF3589 : Way Point (W2)
SP3856, FF3853 : Way Point (W1)

Processing

Static Correction	-96.2msec
Band Pass Filter	15-20_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	None
FX Filter	Filter adaptation=70%

Observer

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME Single Channel Seismic Survey General Information

NT15-07

General

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line8			
DIRECTION (°)	52.8			
DATE	2015/4/22			
WEATHER	Fine but cloudy			
WIND	SW, Light breeze			
SEA CONDITION	Smooth			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001
	N		38-41.65787	
	E		142-58.10852	
	Time (UTC)		12:44:32	
	Water Depth (m)		1619.0	
LAST SHOT POINT	SP No.	3778	FF No.	3778
LAST GOOD SHOT POINT	SP No.	3778	FF No.	3778
	N		39-03.06862	
	E		143-36.07178	
	Time (UTC)		21:21:10	
	Water Depth (m)		3049.0	

Source

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	11 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	150 cu.in
CONFIGURATION	Generator:45 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.0MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

Receiver

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.4m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

Recording

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	8,000 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

Data

SEISMIC DATA	1001.sgd - .3778sgd(2778 Files)
	(Folder name : Line8)
NAVIGATION DATA	Line8_Shot.csv
	Line8_LOG.csv

Remarks

SHIP SPEED AGAINST GROUND : 4.2knot
SHIP SPEED AGAINST WATER : 3.6knot

SP1001, FF1001 : Way Point W1
SP1416, FF1416 : Way Point W2
SP1833, FF1833 : Way Point W3
SP2250, FF2250 : Way Point W4
SP2654, FF2654 : Way Point W5
SP3062, FF3062 : Way Point W6
SP3473, FF3473 : Way Point W7
SP3772, FF3772 : Way Point W8

Processing

Static Correction	-96.4msec
Band Pass Filter	20-25_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	None
FX Filter	Filter adaptation=60%

Observer

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME Single Channel Seismic Survey General Information

NT15-07

General

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line11			
DIRECTION (°)	93.1			
DATE	2015/4/23			
WEATHER	Fine but cloudy			
WIND	South, Gentle breeze			
SEA CONDITION	Calm			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001
	N		39-22.72087	
	E		143-45.33875	
	Time (UTC)		4:50:25	
	Water Depth (m)		3603.0	
LAST SHOT POINT	SP No.	3919	FF No.	3919
LAST GOOD SHOT POINT	SP No.	3919	FF No.	3919
	N		39-17.72072	
	E		144-55.56793	
	Time (UTC)		17:06:36	
	Water Depth (m)		5543.0	

Source

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	15 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	210 cu.in
CONFIGURATION	Generator:105 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.0MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

Receiver

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.4m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

Recording

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	12,500 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

Data

SEISMIC DATA	1001.sgd - 3919.sgd(2919 Files)
	(Folder name : Line11)
NAVIGATION DATA	Line11_Shot.csv
	Line11_LOG.csv

Remarks

SHIP SPEED AGAINST GROUND : 4.5knot
SHIP SPEED AGAINST WATER : 3.9knot

SP1011, FF1011 : Way Point W1
SP1308, FF1308 : Way Point W2
SP1605, FF1605 : Way Point W3
SP1895, FF1895 : Way Point W4
SP2183, FF2183 : Way Point W5
SP2466, FF2466 : Way Point W6
SP2749, FF2749 : Way Point W7
SP3038 FF3038 : Way Point W8
SP3325 FF3325 : Way Point W9
SP3608 FF3608 : Way Point W10
SP3897 FF3897 : Way Point W11

Processing

Static Correction	-96.4msec
Band Pass Filter	15-20_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	1460
FX Filter	Filter adaptation=60%

Observer

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

NME Single Channel Seismic Survey General Information

NT15-07

General

CLIENT	JAMSTEC			
CRUISE	NT15-07			
AREA	Off Tohoku			
LINE	Line12			
DIRECTION (°)	273.1			
DATE	2015/4/23			
WEATHER	Fine but cloudy			
WIND	South, Fresh breeze			
SEA CONDITION	Slight			
FIRST SHOT POINT	SP No.	1001	FF No.	1001
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001
	N		39-14.84734	
	E		144-53.76801	
	Time (UTC)		17:52:15	
	Water Depth (m)		5660.0	
LAST SHOT POINT	SP No.	1507	FF No.	1507
LAST GOOD SHOT POINT	SP No.	1507	FF No.	1507
	N		39-15.91438	
	E		144-39.55902	
	Time (UTC)		20:00:00	
	Water Depth (m)		6131.0	

Source

GUN TYPE	GI Gun
SHOT TYPE	Simultaneous
SHOT MODE	Time
SHOT INTERVAL	15 sec
NUMBER OF STRINGS	1
TOTAL VOLUME	210 cu.in
CONFIGURATION	Generator:105 + Injector:105 cu.in
GUN DEPTH	2.0m
AIR PRESSURE	13.2MPa
GUN CONTROLLER	Hotshot ver 3.300
GUN TOWING WIRE LENGTH	28.1m

Receiver

RECEIVER TYPE	SIG Streamer
HYDROPHONE	S.I.G.16
NUMBER OF CHANNEL	1
NO. OF HYD./GROUP	48
SENSITIVITY	90.0 +/- 1 dB ref 1V/ubar
CABLE DEPTH	3.9m
ACTIVE SECTION	65m
LEAD-IN Towing Length	85m

Recording

RECORDING SYSTEM	Geode ver 9.28.0.0
SAMPLE FREQUENCY	1000Hz
RECORDING LENGTH	11,500 msec
WATER DELAY	0 msec
RECORDING FORMAT	SEG-D 8058 Rev.1
ANALOG PREAMP	39dB
HICUT FILTER	None
LOWCUT FILTER	None
SYSTEM DELAY	100ms (from start recording to gun fireing)
GPS SYSTEM	SkyFix XP(DGPS) No.1 Antenna
NAVIGATION SYSTEM	Navlog ver 1.02.0001

Data

SEISMIC DATA	1001.sgd - 1507.sgd(507 Files)
	(Folder name : Line12)
NAVIGATION DATA	Line12_Shot.csv
	Line12_LOG.csv

Remarks

SHIP SPEED AGAINST GROUND : 5.2knot
SHIP SPEED AGAINST WATER : 5.6knot

SP1006, FF1006 : Way Point W2
SP1251, FF1251 : Way Point W3
SP1501, FF1501 : Way Point W4

Processing

Static Correction	-96.1msec
Band Pass Filter	20-25_350-400
Spherical Divergence Correction	g=t^2
Stolt Migration	1460
FX Filter	Filter adaptation=60%

Observer

Mitsuteru Kuno, Toshimasa Nasu, Takuya Onodera, Satsuki Iijima.

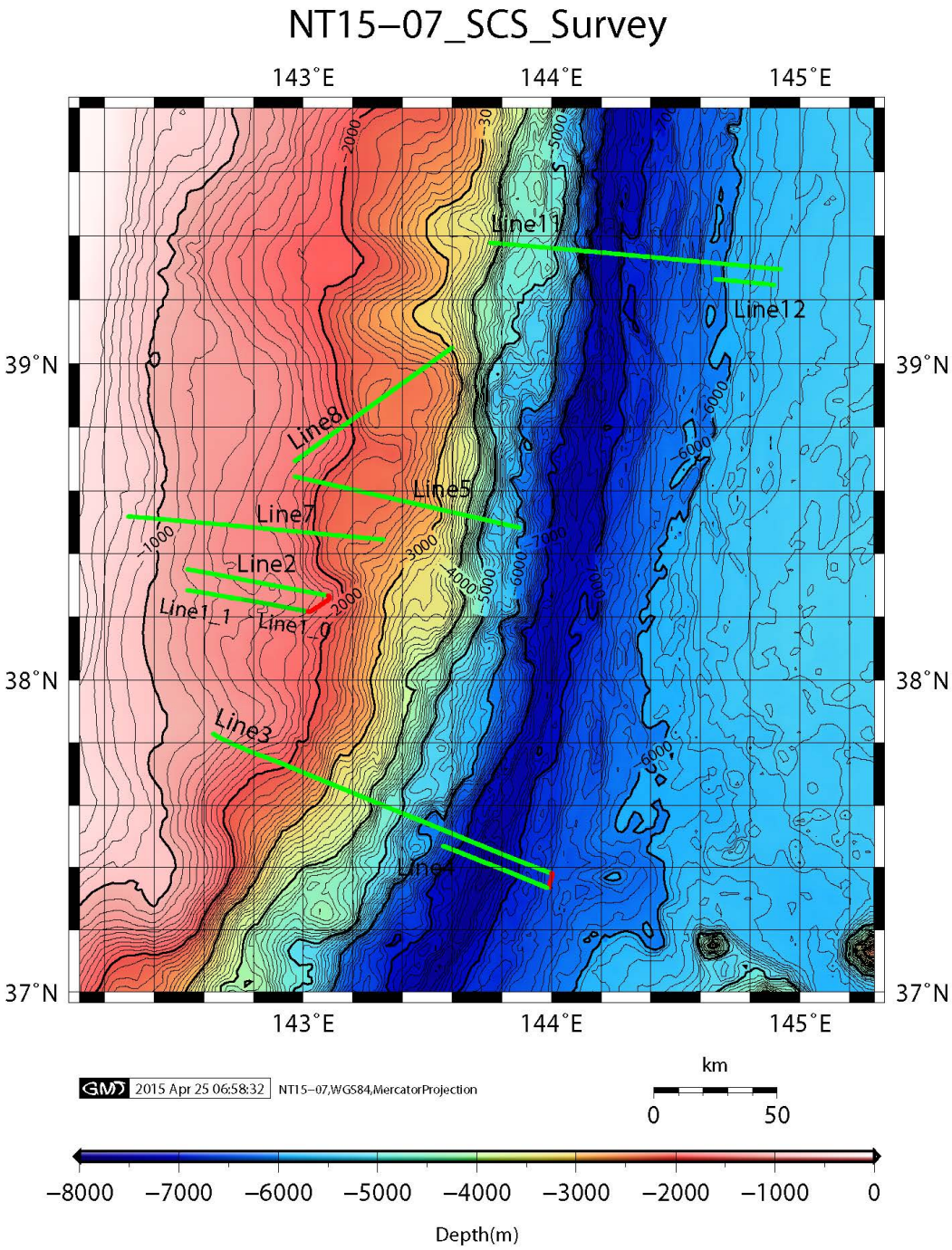


Fig. 6-1-1. SCS track lines, completed during NT15-07

6-2-1. CPT and PC operation

Result of piston coring operation

Operations of coring are summarized in **Table 6-2-1**. Tension records of wire winch during the operations are attached to the APPENDIX. We used 592 Kg weight for piston coring. Positions were measured by two transponders: “Benthos XT-6001-10” for PC01 and 02, “OKI SB-1018 (S/N 08209)” for PC03~06. "*K value"* is the strength barometer of the sea bed sediment, which is expressed by the following formula: *K value* = *pure pull out load / (outer diameter of outer pipe* x *penetration length)*.

Table 6-2-1 summary of PC operation during NT15-07

Date (UTC)	Core ID	Water Depth (m)	Position Latitude	Position Longitude	recovery (m) PC	recovery (m) PL	Tension MAX (kN)	K value
2015/04/17	PC01	1,308	38-16.5966N	142-35.4510E	4.33/6	0.50	22.0	0.19
2015/04/17	PC02	1,403	38-15.3508N	142-44.7518E	4.511/6	0.07	23.0	0.19
2015/04/19	PC03	6,135	37-33.0041N	143-32.0164E	6.81/8	1.15	48.0	0.14
2015/04/21	PC04	3,851	38-31.5583N	143-38.5778E	5.145/6	0.00	35.0	0.19
2015/04/23	PC05	4,838	39-22.0803N	143-56.0710E	6.335/8	1.00	41.0	0.14
2015/04/24	PC06	6,239	36-08.7250N	142-31.7842E	5.13/6	1.19	47.0	0.15

Results of CPT operation

Operations of CPT are summarized in **Table 6-2-2**. All operations were conducted on 2015/04/16(UTC). Tension records of wire winch are attached to the APPENDIX. * "Wire in" and "Wire out" mean wire speeds at CPT leaving from and arrival at the bottom. Penetration of system is estimated by length of soiled pipe after retrieve on the deck. Positions were measured by “Benthos XT-6001-10” transponder.

Table 6-2-2 CPT measurements

ID		Water Depth (m)	Position		Wire out* (m/min)	Wire in* (m/min)	Tension MAX (kN)	Penetration from pipe edge** (m)	Remarks
			Latitude	Longitude					
CPT1	CPT1-1	1,305	38-16.5458N	142-35.4539E	20.0	10.0	12.0	3.90	Not bendded
	CPT1-2	1,305	38-16.5441N	142-35.4284E	20.0	12.0	13.0		
	CPT1-3	1,307	38-16.5376N	142-35.4078E	20.0	10.0	12.0		
	CPT1-4	1,306	38-16.5125N	142-35.3980E	20.0	10.0	10.0		
	CPT1-5	1,307	38-16.5186N	142-35.4414E	20.0	10.0	11.0		
	CPT1-6	1,313	38-16.5363N	142-35.4711E	15.0	10.0	12.0		
	CPT1-7	1,307	38-16.5306N	142-35.4839E	15.0	10.0	12.0		
	CPT1-8	1,308	38-16.5358N	142-35.4881E	15.0	10.0	12.0		
	CPT1-9	1,309	38-16.5271N	142-35.4981E	20.0	10.0	13.0		
	CPT1-10	1,310	38-16.5220N	142-35.5090E	20.0	10.0	13.0		
CPT2	CPT2-1	1,399	38-15.4272N	142-44.6547E	25.0	10.0	11.0	2.15	Pipe bended at 1.6m from pipe edge
	CPT2-2	1,401	38-15.4245N	142-44.6554E	15.0	10.0	11.0		
	CPT2-3	1,400	38-15.4128N	142-44.6404E	20.0	15.0	10.0		
	CPT2-4	1,403	38-15.4056N	142-44.6350E	20.0	10.0	11.0		
	CPT2-5	1,402	38-15.4409N	142-44.6482E	20.0	10.0	10.0		
	CPT2-6	1,401	38-15.4290N	142-44.6554E	15.0	10.0	12.0		
	CPT2-7	1,399	38-15.4322N	142-44.6464E	12.0	8.0	12.0		
	CPT2-8	1,402	38-15.4259N	142-44.6651E	12.0	8.0	11.0		
	CPT2-9	1,400	38-15.4314N	142-44.6734E	12.0	5.0	11.0		
	CPT2-10	1,403	38-15.4381N	142-44.6797E	12.0	10.0	11.0		

7-1. Preliminary result of CPTs

Shuro Yoshikawa

In the sites CPT1 and CPT2 (**Fig. 7-1**), dataset of the present CPT system was successfully acquired, although the rod was bended during the survey in CPT2. Based on the observation of the wire tension, the bend probably occurred during the first penetration in CPT2. The bend is due to high shear strength of the subseafloor deposits in CPT2, on the basis of a comparison of shear strength of the sediment cores of both sites that was measured by portable shear testing device using a vane. After this cruise, we will examine the relationship between change in the value of the penetration resistance by CPT and vertical variation of the shear strength of the core in CPT1, and also discuss the condition during the penetration based on the elevation and acceleration data, to further improvement of the CPT system for research on deep seafloor.

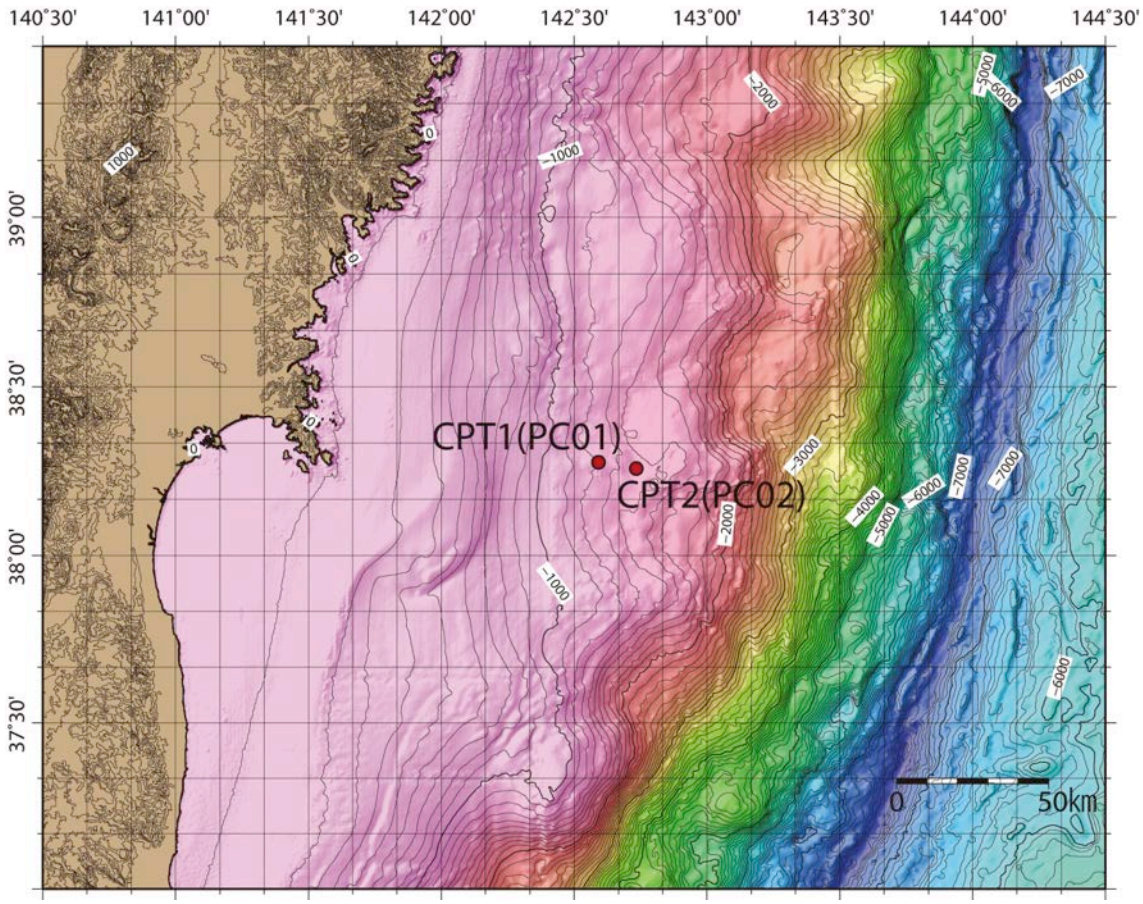


Fig. 7-1. Location of the CPT sites

7-2. Preliminary results of Lithology of Piston cores

Kazuno Arai

Piston core samples were collected on a landward trench slope at Japan Trench, northeast Japan using 6 m and 8 m piston-corer systems operated by Marine Work Japan Co. Ltd (**Fig. 7-2-1**). The piston corer system has a pilot corer, so that a piston core sample and a pilot core sample were collected from one coring site. Sample names of the pilot and piston cores are NT15-07 PL03, 04, 05, 06 and PC03, 04, 05, 06 in this description. Each section of archive half of the pilot and piston cores were visually described using VCD sheet (see appendix). In this chapter, the cores at 4 sites (PC03, 04, 05, 06) were described (**Fig. 7-2-2**).

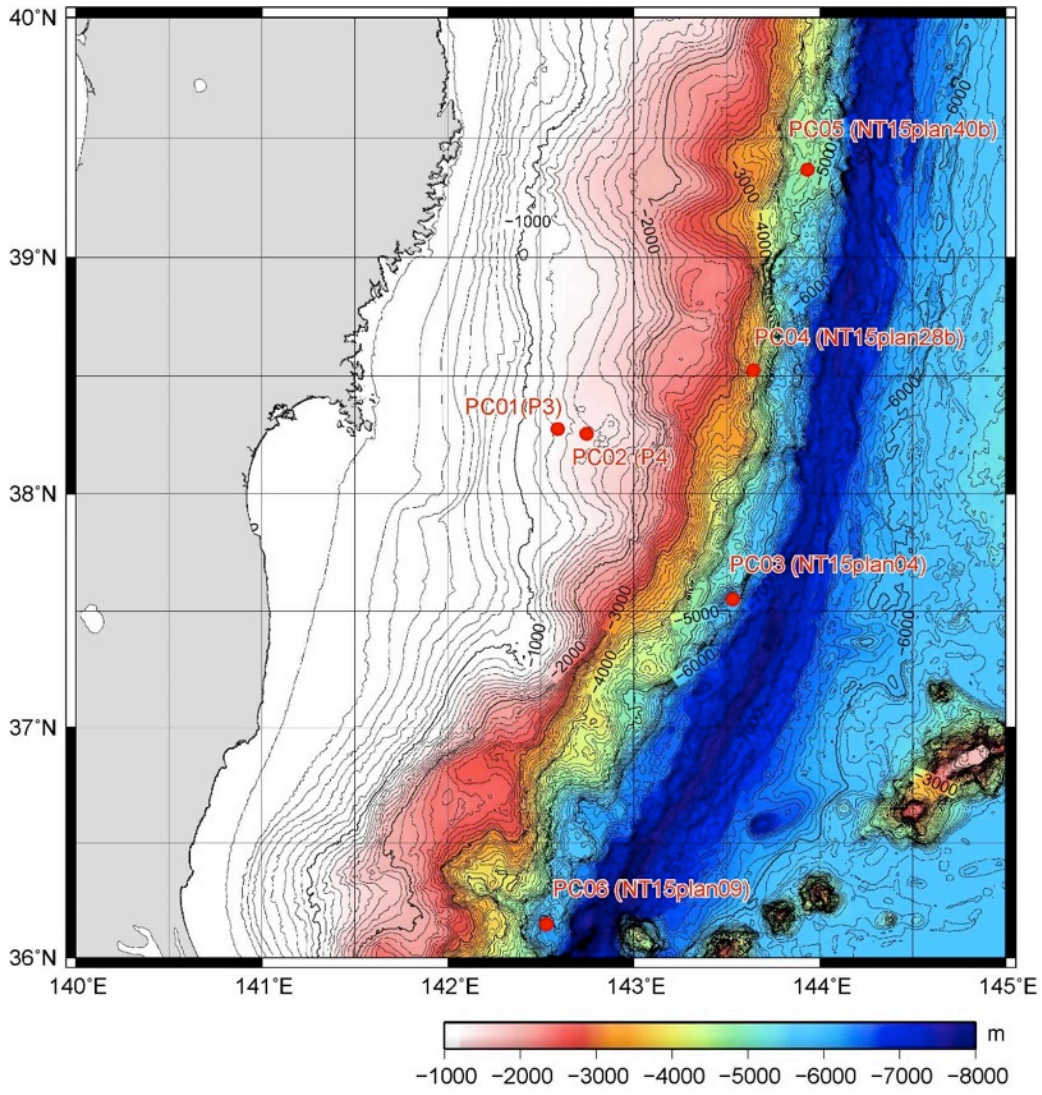


Fig. 7-2-1. Locations of piston cores. Red circle: piston core position.

PL03 & PC03

PL03 and PC03 were conducted at the mid-slope terrace on a landward trench slope off Fukushima, at 37°33.0041'N and 143°32.0164'E (NT15plan04). The water depth was 6135 m.

The pilot and piston cores were 114.5, 681 cm long, respectively. The sediments of pilot and piston cores consist of mainly dark olive (7.5Y4/3) and grayish olive (7.5Y3/2) clay and silty clay. A lot of olive black sand layers and patches were interbedded with clayey sediments. 1–5 sand layers were interbedded at a rate of 7 intervals per 1 m. These sand layers were thin (1–5 mm in thickness) and well sorted. Yellowish brown clay layer and patches were shown at 22–24 cm-bsf of PC03, 0–2 and 15.5–16 cm-bsf of PL03. Bioturbated ash patches were seen at 132–133 and 474–477 cm-bsf of PC03.

PL04 & PC04

PL04 and PC04 were conducted at the depression associated with faults on an upper landward trench slope off Iwate, at 38°31.5583'N and 143°38.5778'E (NT15plan28b). The water depth was 3851 m.

The piston core was 505.5 cm long. The pilot core was not recovered. The sediments of the piston cores consist of mainly bioturbated dark olive (7.5Y4/3) silty clay and olive black to grayish olive (7.5Y4/2-7.5Y3/2) silt with sand. A few sand layers were interbedded at a rate of 1–2 layers per 1 m. These sand layers were 1–10 mm in thickness.

PL05 & PC05

PL05 and PC05 were conducted at mid-slope terrace on a landward trench slope off Iwate, at 39°22.0803'N and 143°56.0710'E (NT15plan40b). The water depth was 4838 m.

The pilot and piston cores were 100, 616 cm long, respectively. The sediments of pilot and piston cores consist of 3 types of sediments, dark olive (7.5Y4/3), olive black (7.5Y3/2) and grayish olive (7.5Y4/2) silty clay-silt. Yellow brown clay patch was shown at 1–2 cm-bsf of PL05. One or 3–8 sand layers were interbedded at a rate of 1–2 intervals per 1 m. These sand layers were very thin (1–3 mm in thickness). Ash layer was seen at 264–265 cm-bsf of PC05.

PL06 & PC06

PL06 and PC06 were conducted at the small basin that connected from a submarine canyon, on mid-slope terrace off Ibaraki, at 36°8.7250'N and 142°31.7842'E (NT15plan09). The water depth was 6239 m.

The pilot and piston cores were 119, 513 cm long, respectively. The sediments of pilot and piston cores consist of 3 types of sediments, dark olive (7.5Y4/3), olive black (7.5Y3/2) and grayish olive (7.5Y4/2) clay-silt. Yellow brown clay layer were shown at 24–29 and 101–101.5 cm-bsf of PL06. 1–3 sand layers

were interbedded at a rate of 4 intervals per 1 m. These sand layers were thin (1–10 mm in thickness). Subrounded mud clast (long axis 9 cm long) was shown at 102–110 cm-bsf of PC06. Disturbed sediment by coring were shown at 103–117 cm of PL06.

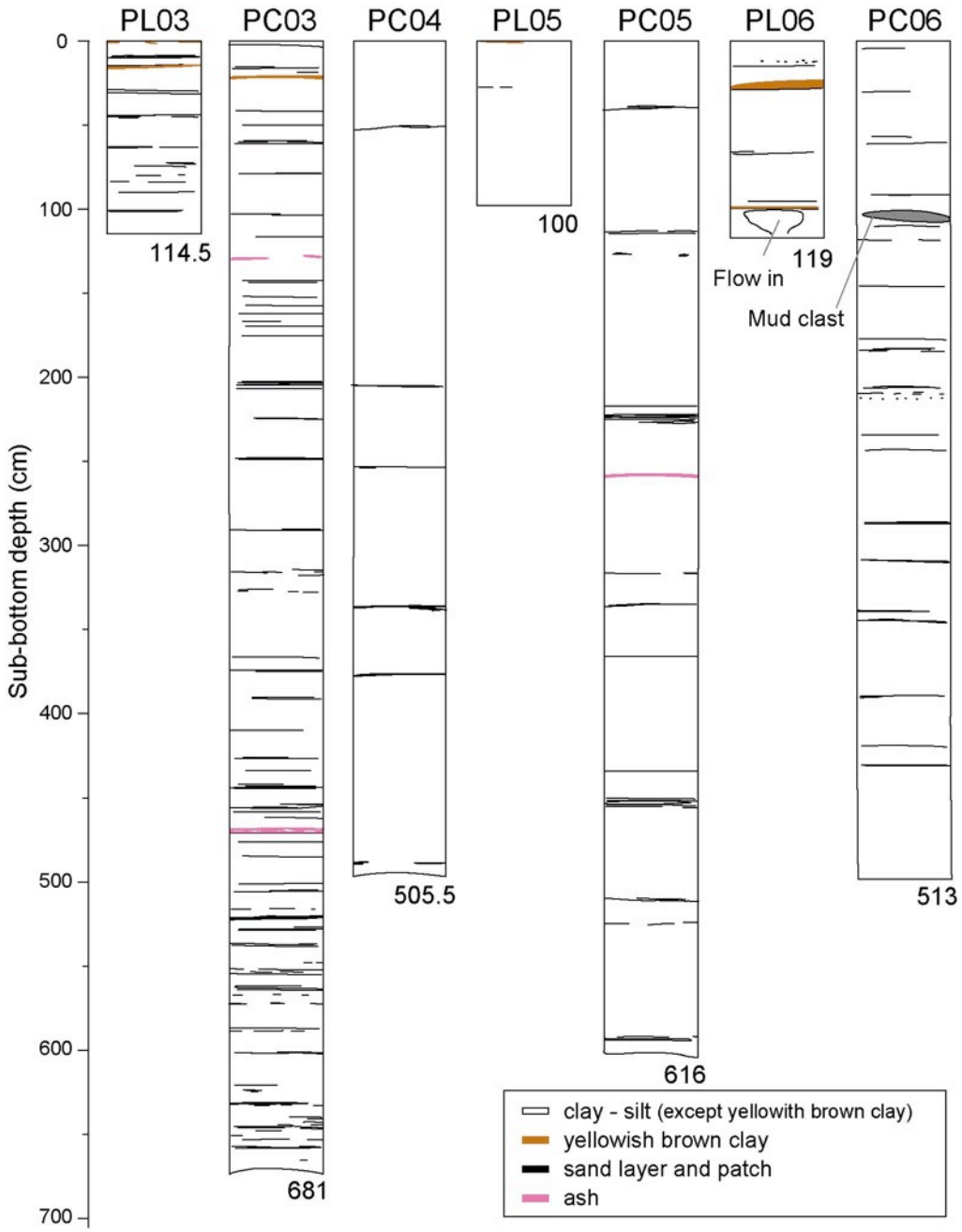


Fig. 7-2-2. Lithological column of the piston and pilot cores.

7-3. Preliminary Results of SCS

In the profiles Line-1, 2, 3, 5, 7, and 8, fore-arc basins representing seafloor subsidence are shown on the upper trench slope (**Figs. 7-3-1 ~ 7-3-10**). The subsidence events were probably episodic, characterized by prolonged periods of extensional deformation associated with the development of numerous normal faults.

In the area of steep slopes in deep water depths in the middle and lower trench slopes, resolution of the SCS records is limited. There are some terraces and sediment deposits are found in the middle and lower slope (Line-3 and 11). The sedimentary layers are dipping landward.

In the seaward trench slope, sedimentary layers on igneous basements can be identified. The thickness of sedimentary layers are ~0.4 sec in Line-3, ~0.3 sec in Line-4, and ~0.4 sec in Line-12, respectively. In Line-11, the thickness of sedimentary layers varies from ~0.4 sec at the east side and ~0.2 sec at the west side.

References

Arai, K., T. Inoue, K. Ikehara, and T. Sasaki, Episodic subsidence and active deformation of the forearc slope along the Japan Trench near the epicenter of the 2011 Tohoku Earthquake, Earth Planet. Sci. Lett., 408, 9-15, 2014.

Tsuru, T., J.-O. Park, S. Miura, S. Kodaira, Y. Kido, and T. Hayashi, Along-arc structural variation of the plate boundary at the Japan Trench margin: Implication of interplate coupling, J. Geophys. Res., 107, 2357, doi:10.1029/2001JB001664, 2002.

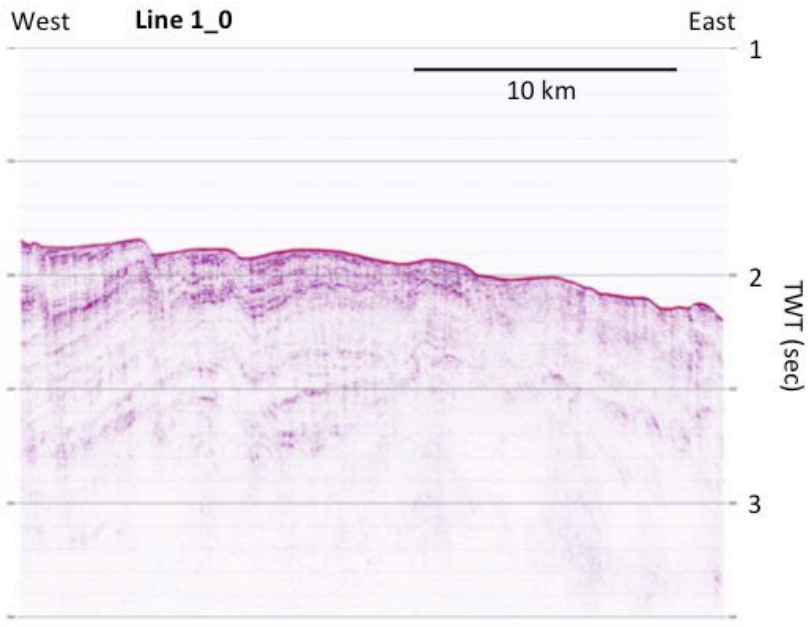


Fig. 7-3-1, Seismic profile of Line-1_0. Traces are displayed in order of shot number from the left. Vertical axis indicates two-way travel time (TWT: sec). A scale of 10 km and a rough orientation are displayed for the horizontal direction.

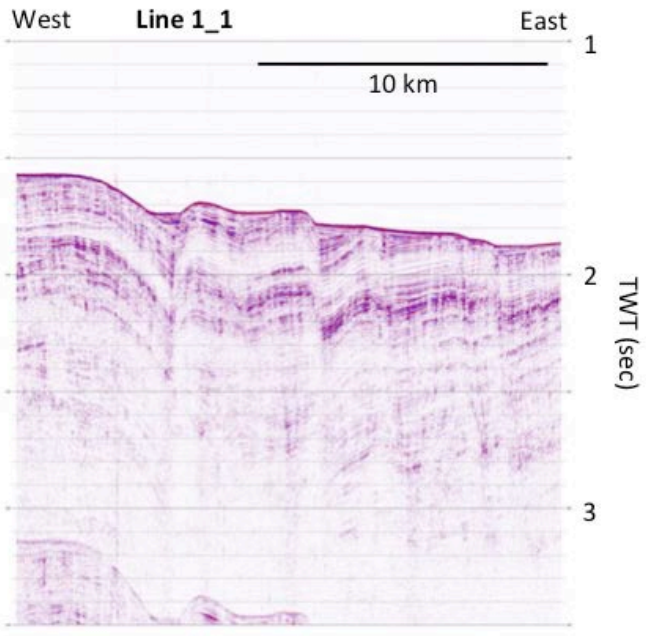


Fig. 7-3-2, Seismic profile of Line-1_1

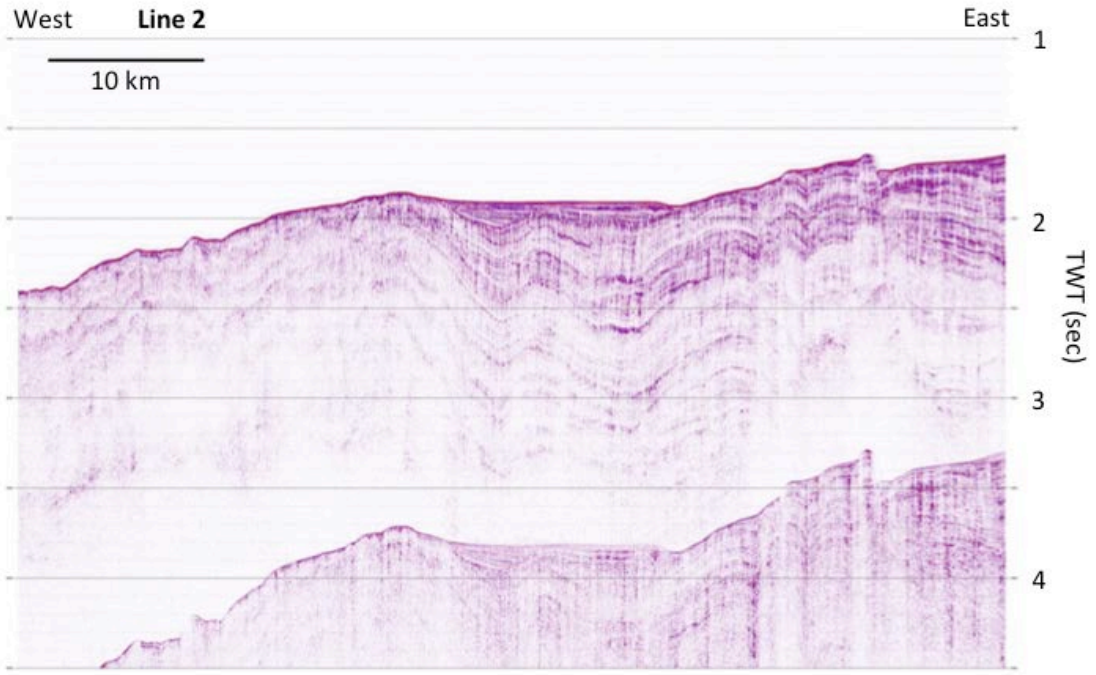


Fig. 7-3-3, Seismic profile of Line-2

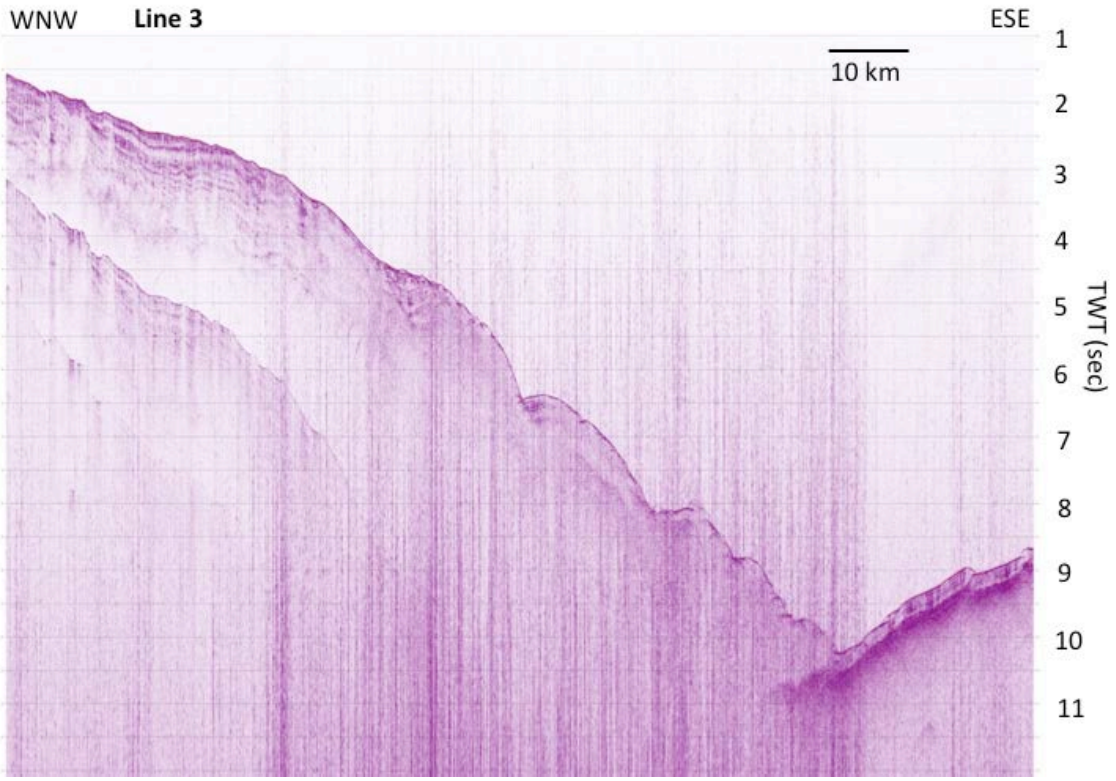


Fig. 7-3-4, Seismic profile of Line-3

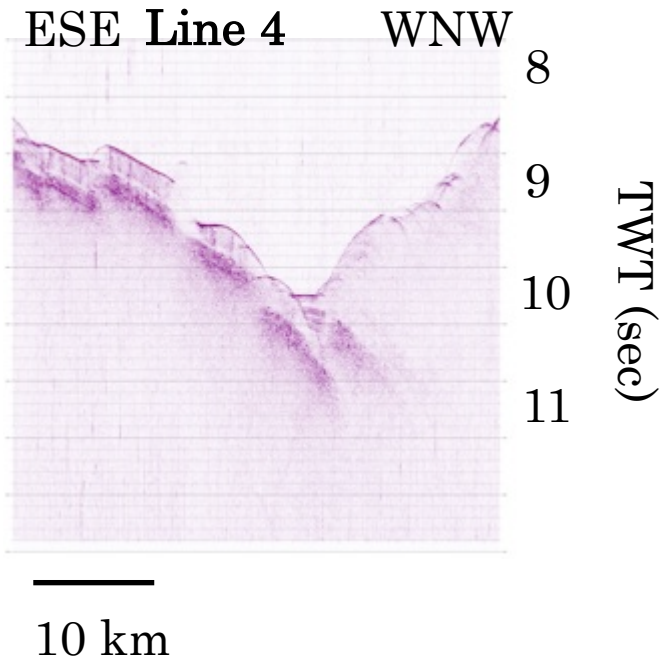


Fig. 7-3-5, Seismic profile of Line-4

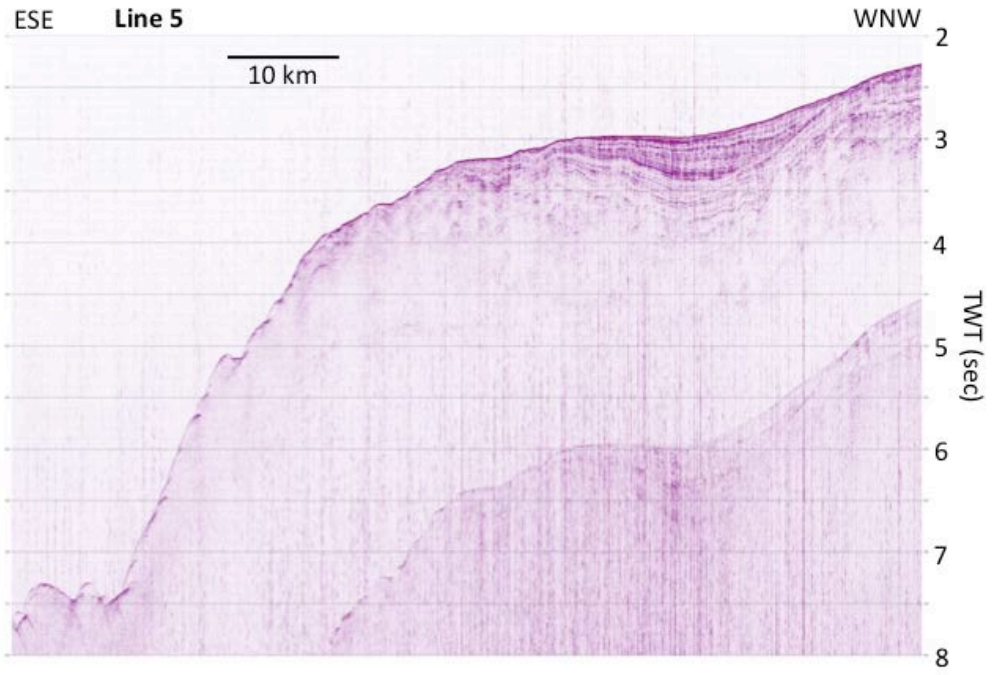


Fig. 7-3-6, Seismic profile of Line-5

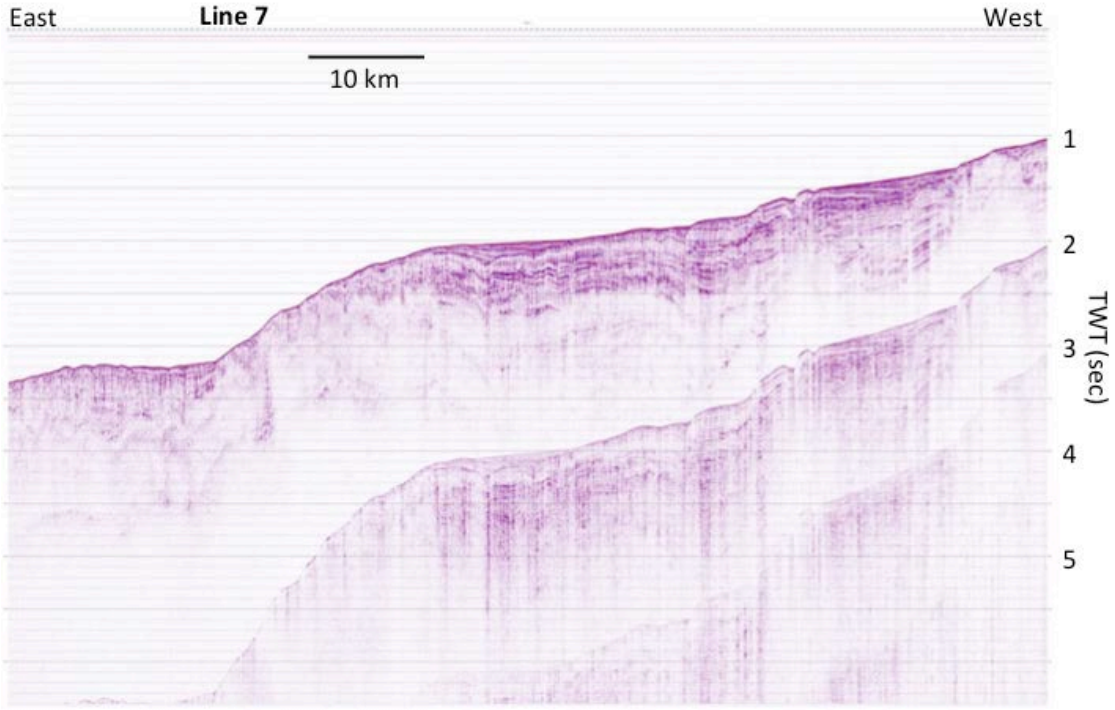


Fig. 7-3-7, Seismic profile of Line-7

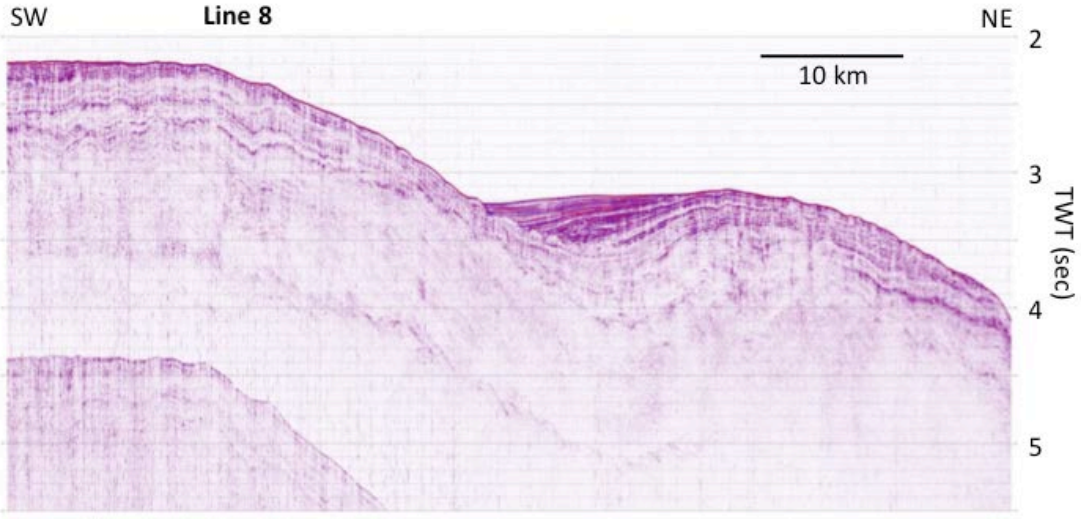


Fig. 7-3-8, Seismic profile of Line-8

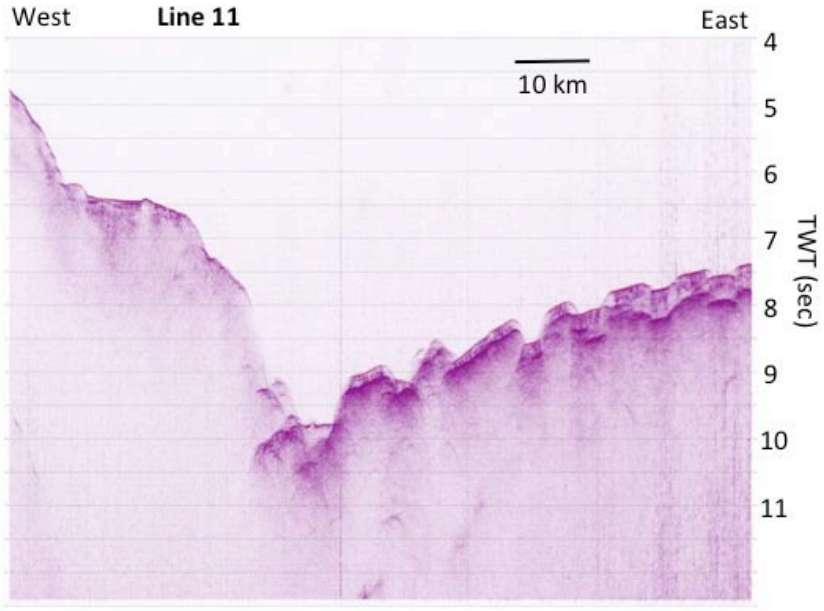


Fig. 7-3-9, Seismic profile of Line-11

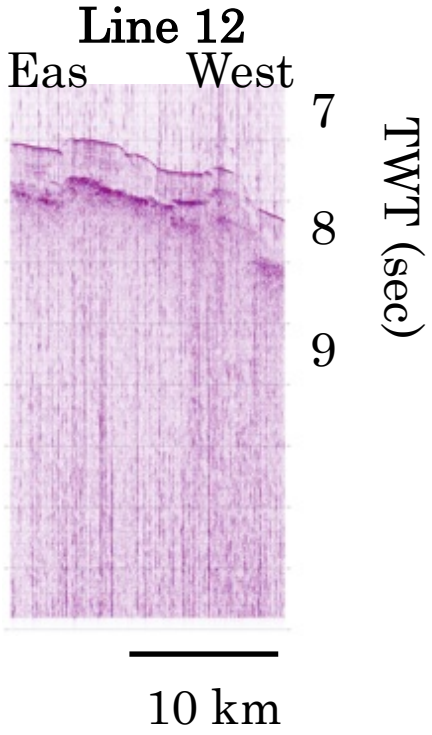


Fig. 7-3-10, Seismic profile of Line-12

7-4 XBP measurement

The sound velocity profile of the local water column, which was used for calibration of depth, was estimated from a temperature profile based on in-situ XBT (Expendable Bathythermograph) measurements.
We made 6 XBT measurements during the cruise (**Table 7-4-1**). Temperature profiles are plotted in **Fig. 7-4-1** Bathymetric data were collected during the cruise using multi narrow beam system SEABAT 8160 (**Fig. 7-4-2**).

Table 7-4-1 Positions of XBT measurement

Data Num	Date	time	Lat	Long	Probe Type	Max depth (m)
283	20150416	5:56:23	38-16.4536N	142-33.9402E	T05	1831
284	20150418	20:52:42	37-33.0108N	143-31.8984E	T05	1831
285	20150419	7:26:59	38-23.6657N	143-21.8890E	T05	1831
286	20150421	20:42:33	38-31.4922N	143-38.5683E	T05	1831
287	20150422	23:25:31	39-21.9132N	143-55.2867E	T05	1831
288	20150424	19:09:39	36-08.6209N	142-30.7685E	T05	1831

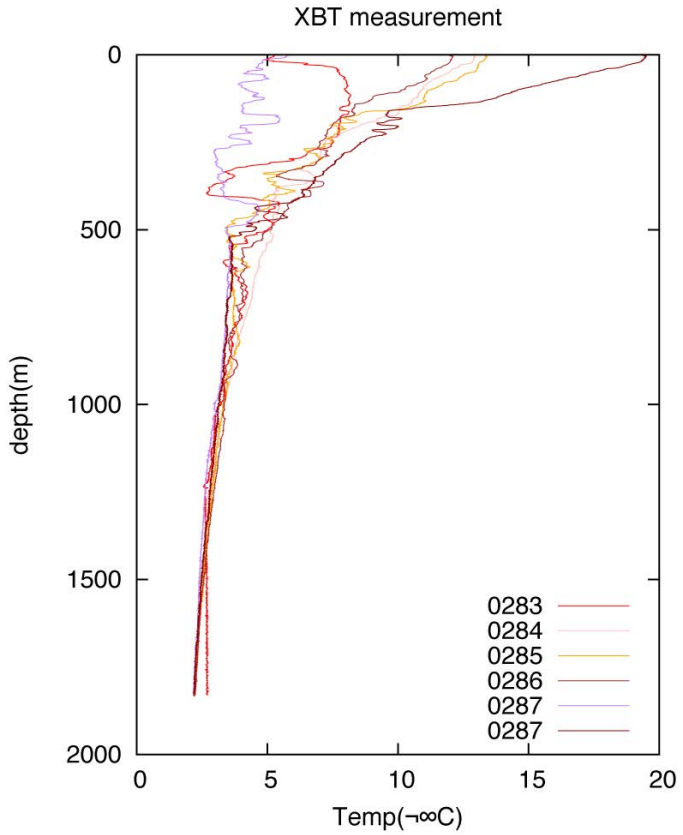


Fig.7-4-1. Temperature profiles measured by XBTs

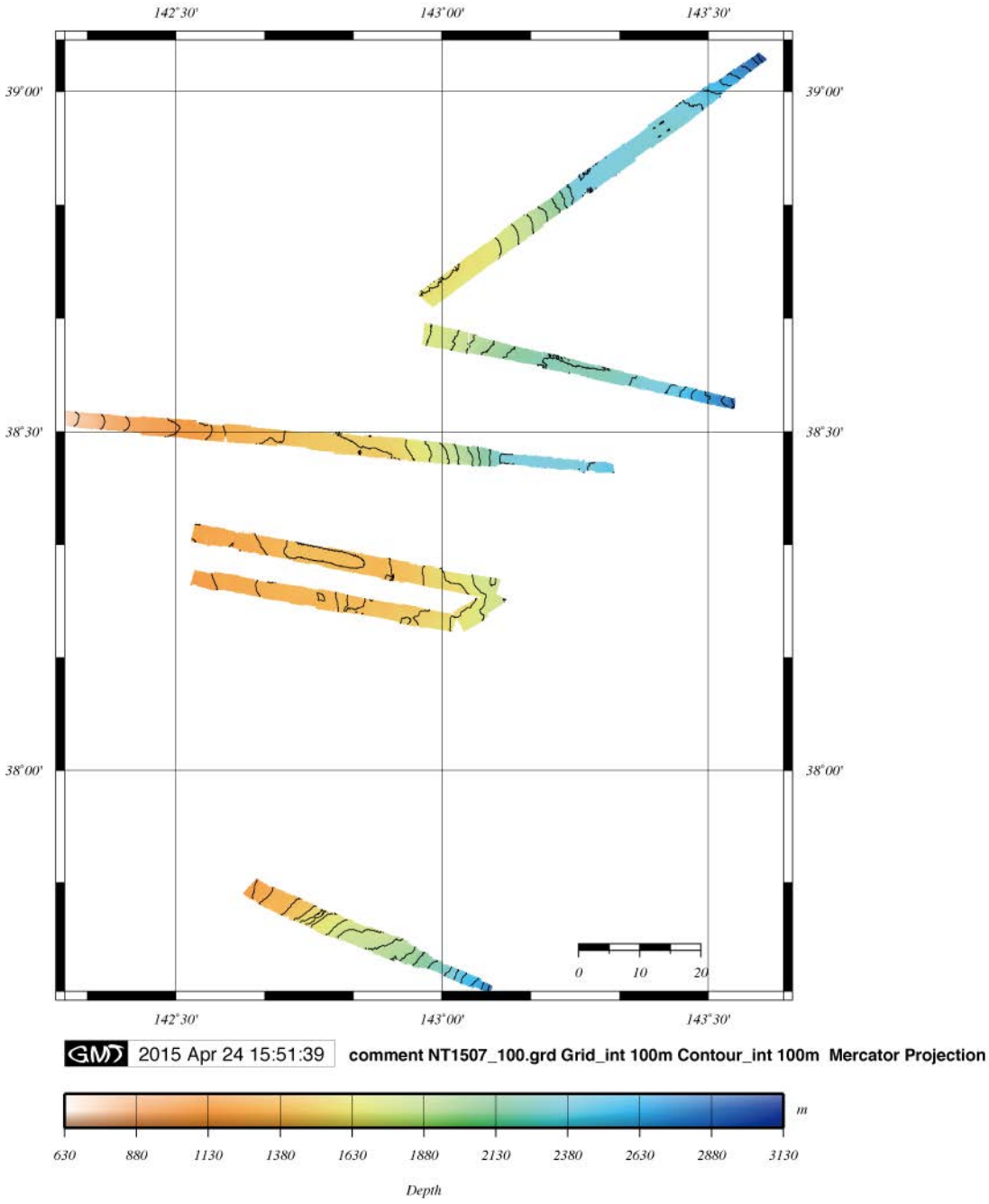


Fig. 7-4-2. Bathymetric data were collected during the cruise

8. Acknowledgement

We gratefully recognize the efforts of Cap. Ukekura and his Natsushima crew during the cruise. We thank all the support from staffs in Research Fleet Department, JAMSTEC. Especially thanks to Mr. Yuta Yamamuro. TK acknowledge the support for the research grant found **(**MEXT Grants-in-Aid :26000002. PI Ryota Hino**)**

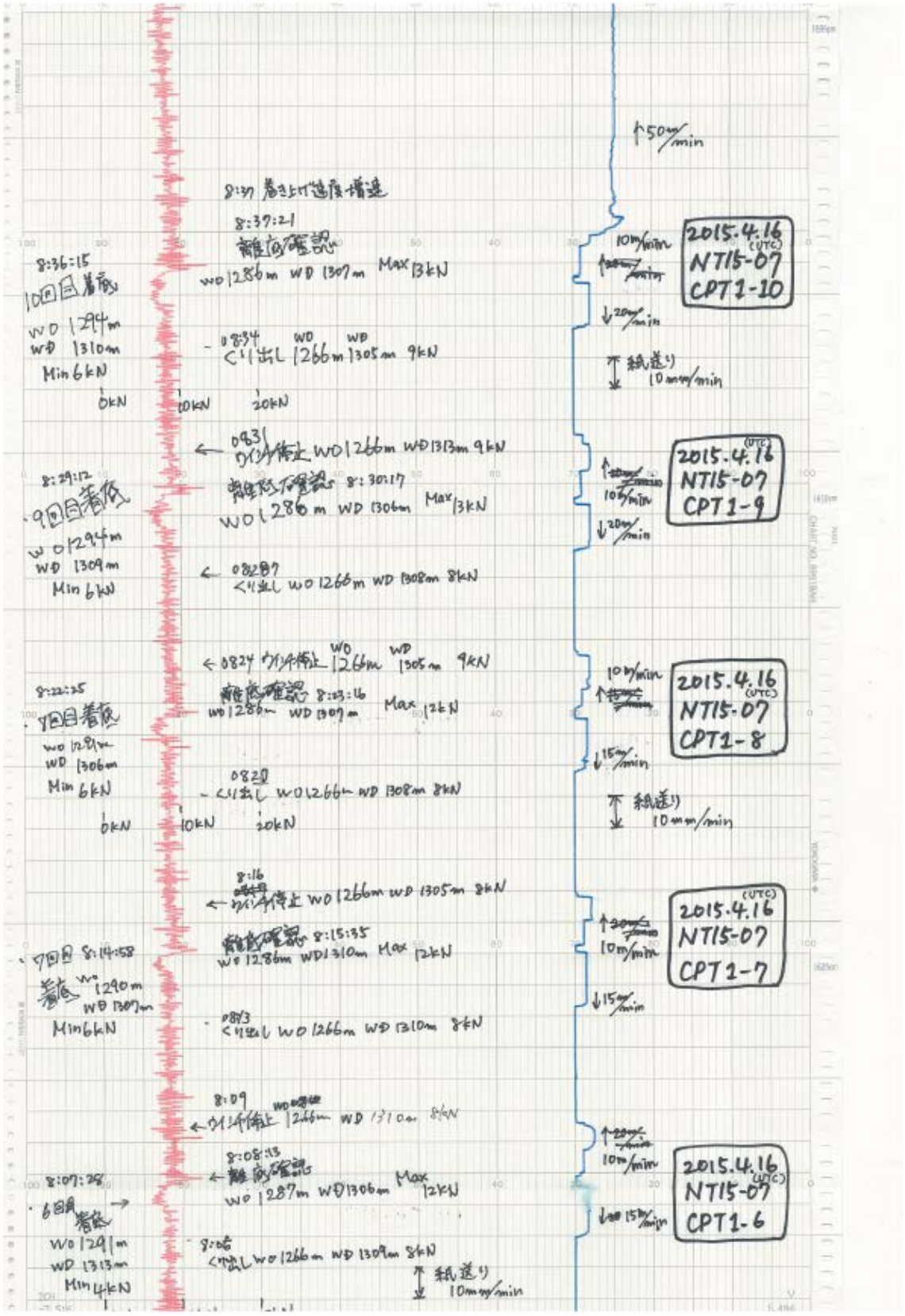
9. Notice on Using

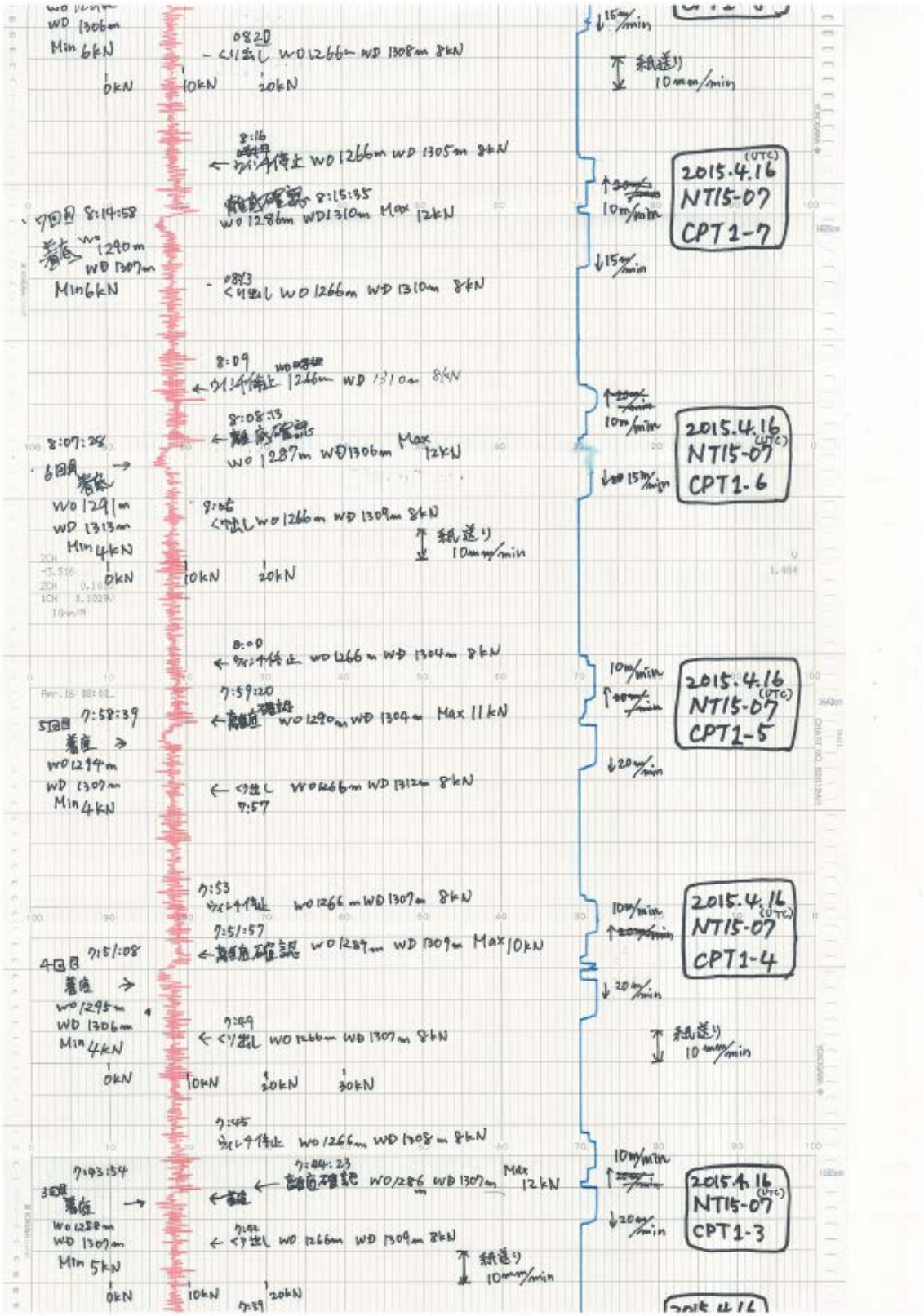
Notice on using: Insert the following notice to users regarding the data and samples obtained.

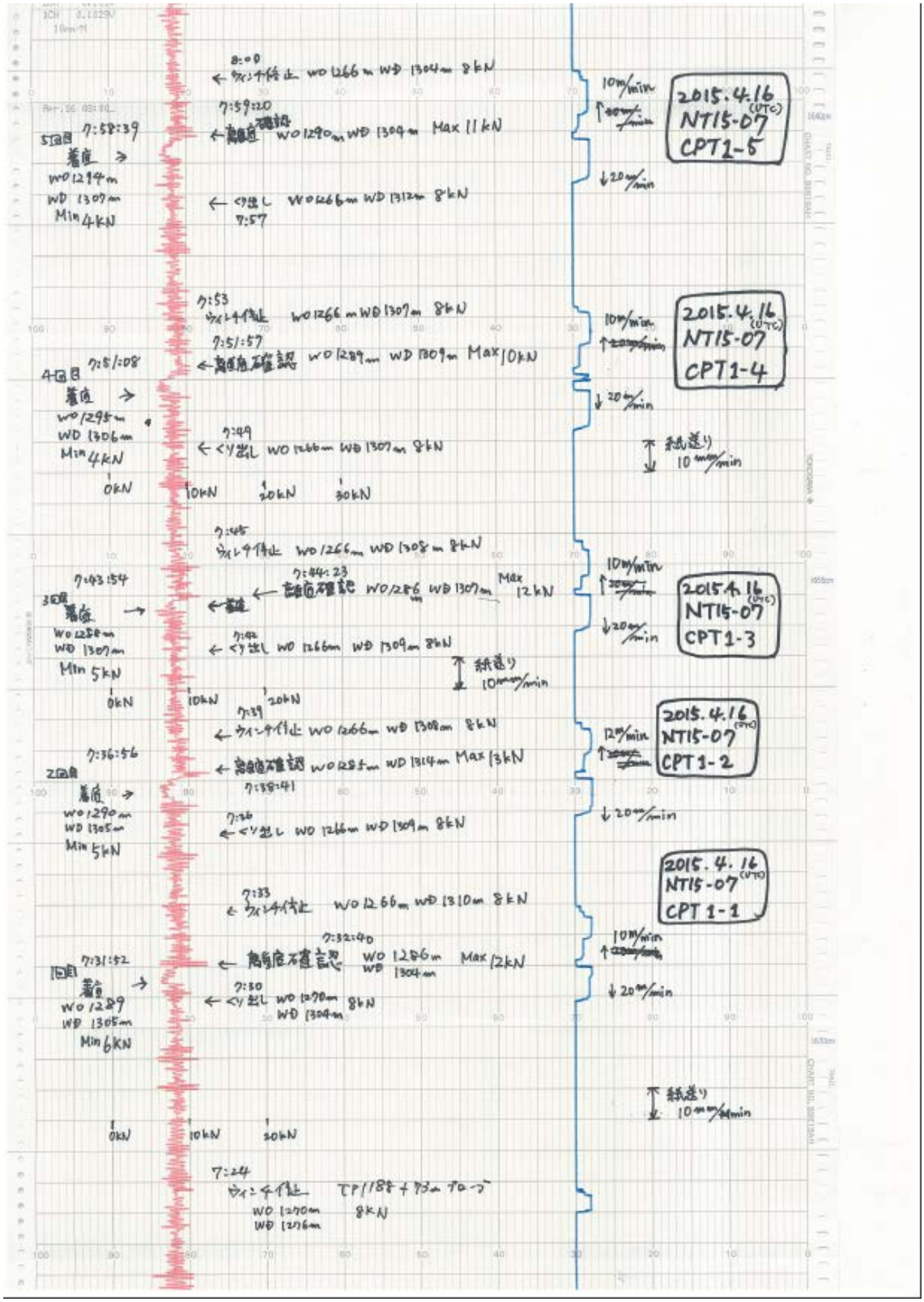
APPENDIX

CPT winch tension records

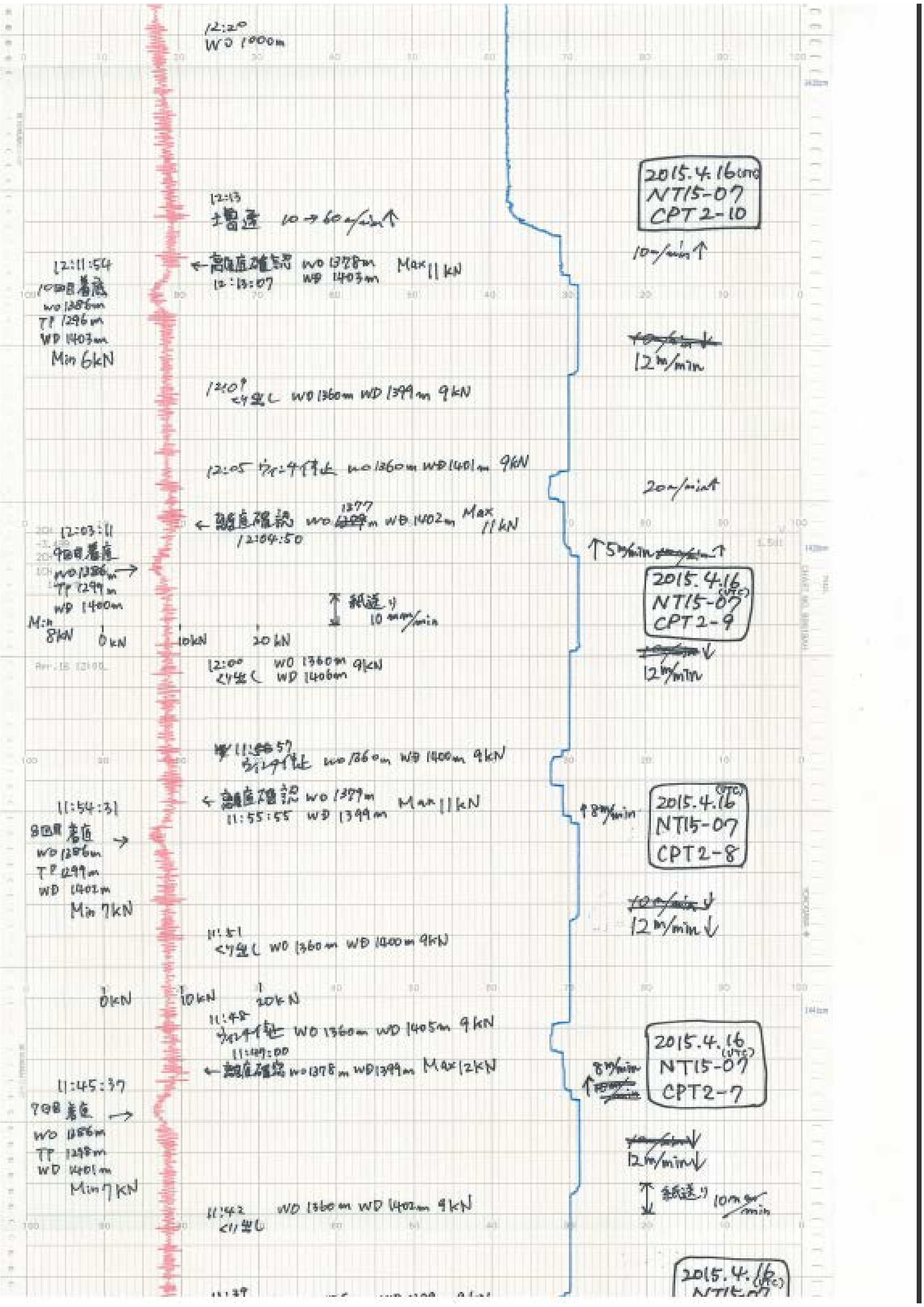
CPT1


50m/min
8:37 巻上げ速度増速
8:37:21
離底確認
WO 1286m WD 1307m Max 13kN
8:36:15
10回目着底
WO 1294m
WD 1310m
Min 6kN
0kN
10kN
20kN
08:34
くい出し 1266m 1305m 9kN
10m/min
20m/min
2015.4.16 (UTC)
NT15-07
CPT1-10
繰送り
10mm/min
08:31
ウインチ停止 WO 1266m WD 1313m 9kN
8:29:12
9回目着底
WO 1294m
WD 1309m
Min 6kN
離底確認 8:30:17
WO 1286m WD 1306m Max 13kN
08:27
くい出し WO 1266m WD 1308m 8kN
2015.4.16 (UTC)
NT15-07
CPT1-9
8:22:25
8回目着底
WO 1291m
WD 1306m
Min 6kN
0824 ウインチ停止 WO 1266m WD 1305m 9kN
離底確認 8:23:16
WO 1286m WD 1307m Max 12kN
08:21
くい出し WO 1266m WD 1308m 8kN
10m/min
15m/min
2015.4.16 (UTC)
NT15-07
CPT1-8
繰送り
10mm/min
8:16
ウインチ停止 WO 1266m WD 1305m 8kN
8:14:58
7回目着底
WO 1290m
WD 1307m
Min 6kN
離底確認 8:15:35
WO 1286m WD 1310m Max 12kN
08:13
くい出し WO 1266m WD 1310m 8kN
10m/min
15m/min
2015.4.16 (UTC)
NT15-07
CPT1-7
8:09
ウインチ停止 WO 1266m WD 1310m 8kN
8:08:13
離底確認
WO 1287m WD 1306m Max 12kN
8:07:28
6回目着底
WO 1291m
WD 1313m
Min 4kN
8:06
くい出し WO 1266m WD 1309m 8kN
繰送り
10mm/min
10m/min
15m/min
2015.4.16 (UTC)
NT15-07
CPT1-6

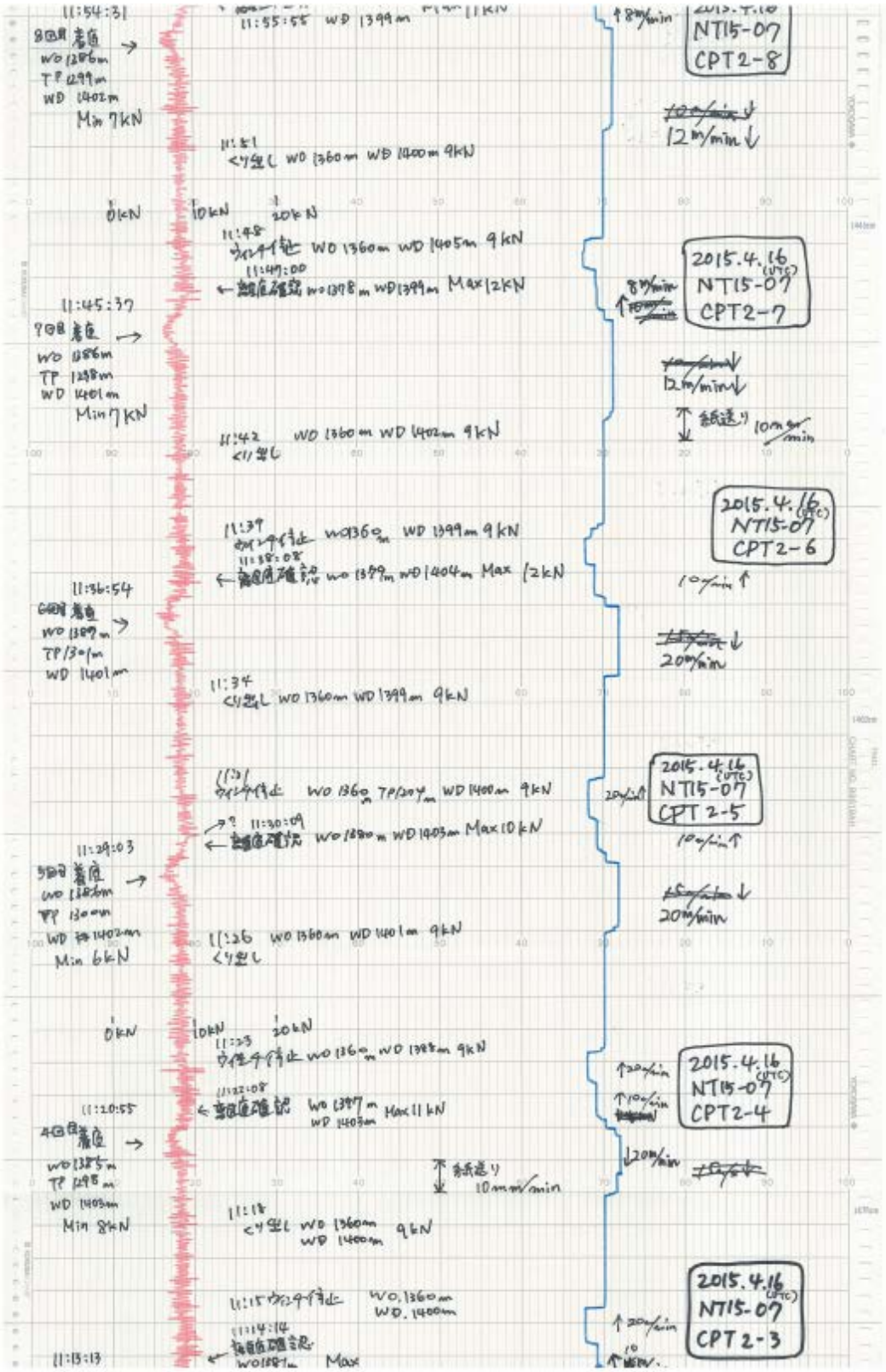

2015.4.16 (UTC)
NT15-07
CPT1-7
2015.4.16 (UTC)
NT15-07
CPT1-6
2015.4.16 (UTC)
NT15-07
CPT1-5
2015.4.16 (UTC)
NT15-07
CPT1-4
2015.4.16 (UTC)
NT15-07
CPT1-3
10kN
20kN
30kN
0kN
Min 6kN
Min 4kN
Min 5kN
Max 12kN
Max 11kN
Max 10kN
10m/min
15m/min
20m/min
繰り返し 10mm/min

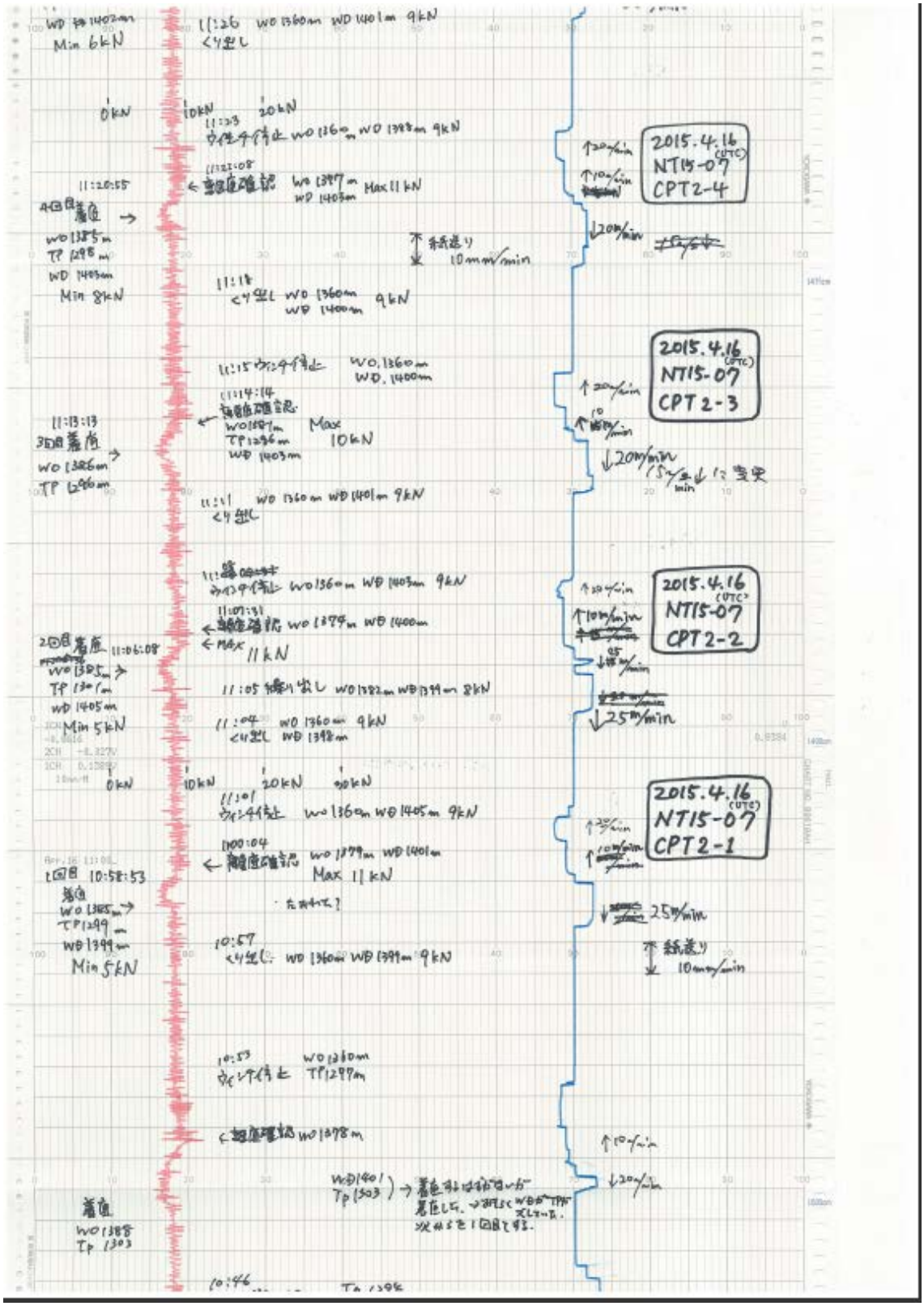

2015.4.16 (UTC)
NT15-07
CPT1-5
2015.4.16 (UTC)
NT15-07
CPT1-4
2015.4.16 (UTC)
NT15-07
CPT1-3
2015.4.16 (UTC)
NT15-07
CPT1-2
2015.4.16 (UTC)
NT15-07
CPT1-1
5回目 着底
4回目 着底
3回目 着底
2回目 着底
1回目 着底
10m/min
20m/min
繰返り
10mm/min
0kN
10kN
20kN
30kN

CPT2



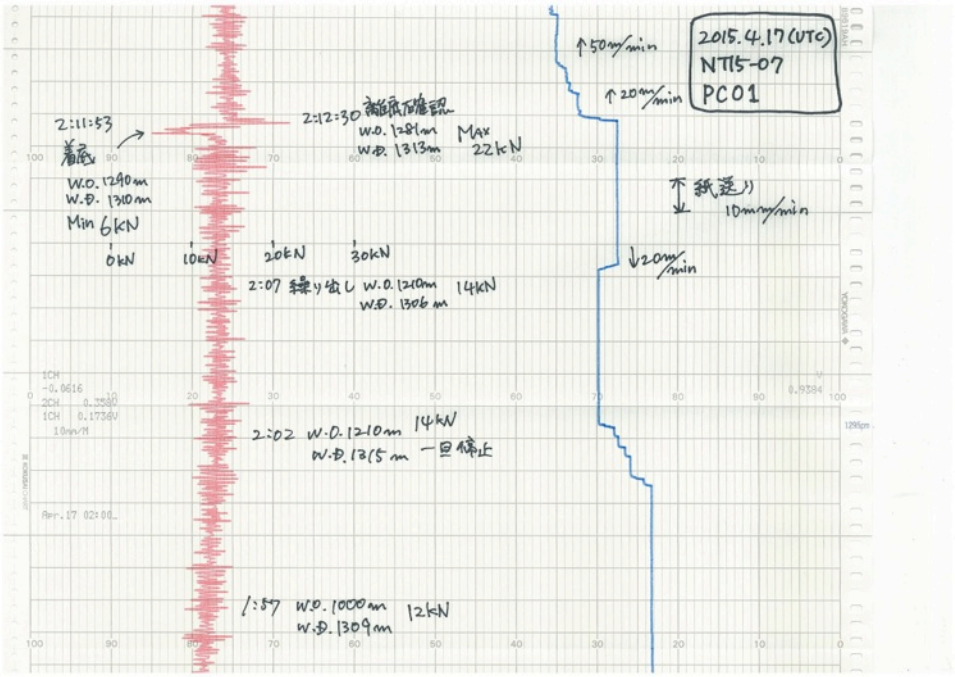
12:20 WD 1000m
2015.4.16(UTC) NT15-07 CPT2-10
12:13 増速 10→60m/min↑
10m/min↑
12:11:54 10回目着底 WD 1386m TP 1296m WD 1403m Min 6kN
←離底確認 WD 1378m WD 1403m Max 11kN 12:13:07
12m/min
12:09 くり出し WD 1360m WD 1399m 9kN
12:05 ウインチ停止 WD 1360m WD 1401m 9kN
20m/min↑
12:03:11 9回目着底 WD 1386m TP 1299m WD 1400m Min 8kN
←離底確認 WD 1377m WD 1402m Max 11kN 12:04:50
↑5m/min
2015.4.16(UTC) NT15-07 CPT2-9
紙送り 10mm/min
0kN 10kN 20kN
12m/min
12:00 くり出し WD 1360m WD 1406m 9kN
11:58:57 ウインチ停止 WD 1360m WD 1400m 9kN
←離底確認 WD 1379m WD 1399m Max 11kN 11:55:55
11:54:31 8回目着底 WD 1386m TP 1299m WD 1402m Min 7kN
↑8m/min
2015.4.16(UTC) NT15-07 CPT2-8
12m/min↓
11:51 くり出し WD 1360m WD 1400m 9kN
0kN 10kN 20kN
11:48 ウインチ停止 WD 1360m WD 1405m 9kN
11:49:00 ←離底確認 WD 1378m WD 1399m Max 12kN
11:45:37 7回目着底 WD 1386m TP 1298m WD 1401m Min 7kN
8m/min↑
2015.4.16(UTC) NT15-07 CPT2-7
12m/min↓
紙送り 10mm/min
11:42 くり出し WD 1360m WD 1402m 9kN
2015.4.16(UTC)


11:54:31
8回目 着底
WD 1386m
TP 1399m
WD 1402m
Min 7kN
11:55:55 WD 1399m
18m/min
2015.4.16
NT15-07
CPT2-8
12m/min
11:51
くり出し WD 1360m WD 1400m 9kN
0kN
10kN
20kN
11:48
ウインチ巻上 WD 1360m WD 1405m 9kN
11:47:00
←地層確認 WD 1378m WD 1399m Max 12kN
8m/min
2015.4.16 (UTC)
NT15-07
CPT2-7
11:45:37
7回目 着底
WD 1386m
TP 1398m
WD 1401m
Min 7kN
12m/min
11:42
くり出し WD 1360m WD 1402m 9kN
繰返し 10mm/min
2015.4.16 (UTC)
NT15-07
CPT2-6
11:39
ウインチ停止 WD 1360m WD 1399m 9kN
11:38:08
←地層確認 WD 1379m WD 1404m Max 12kN
10m/min
11:36:54
6回目 着底
WD 1389m
TP 1391m
WD 1401m
20m/min
11:34
くり出し WD 1360m WD 1399m 9kN
11:31
ウインチ停止 WD 1360m TP 1394m WD 1400m 9kN
2015.4.16 (UTC)
NT15-07
CPT2-5
20m/min
11:30:09
←地層確認 WD 1380m WD 1403m Max 10kN
10m/min
11:29:03
5回目 着底
WD 1386m
TP 1390m
WD 1402m
Min 6kN
20m/min
11:26
くり出し WD 1360m WD 1401m 9kN
0kN
10kN
20kN
11:23
ウインチ停止 WD 1360m WD 1398m 9kN
20m/min
10m/min
2015.4.16 (UTC)
NT15-07
CPT2-4
11:22:08
←地層確認 WD 1397m WD 1403m Max 11kN
11:20:55
4回目 着底
WD 1385m
TP 1398m
WD 1403m
Min 8kN
繰返し 10mm/min
20m/min
11:18
くり出し WD 1360m WD 1400m 9kN
11:15 ウインチ停止 WD. 1360m WD. 1400m
11:14:14
←地層確認 WD 1381m Max
20m/min
2015.4.16 (UTC)
NT15-07
CPT2-3
11:13:13

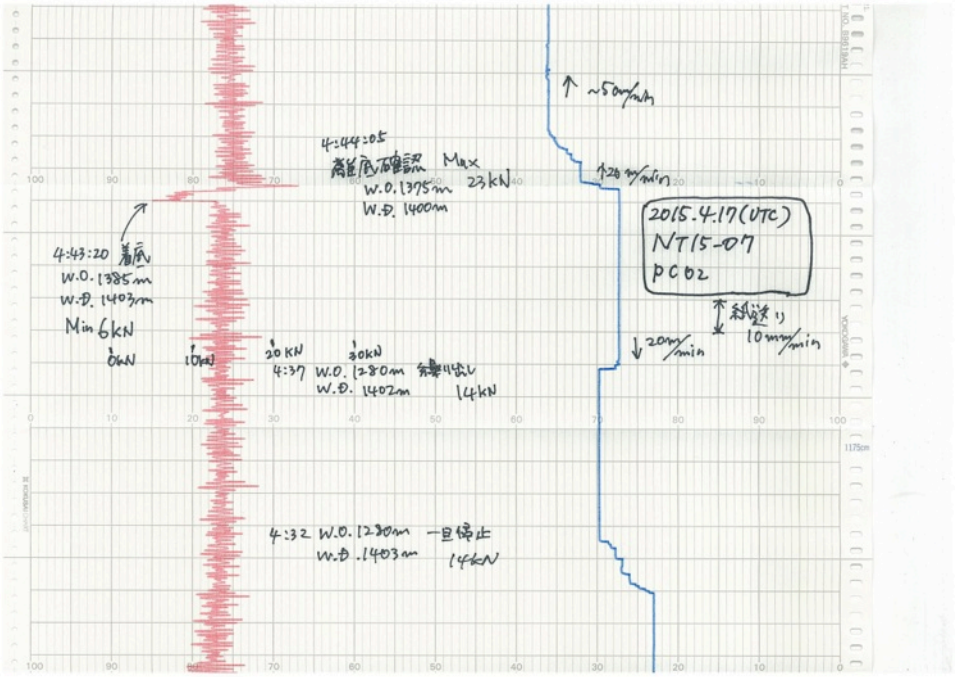

2015.4.16 (UTC)
NT15-07
CPT2-4
2015.4.16 (UTC)
NT15-07
CPT2-3
2015.4.16 (UTC)
NT15-07
CPT2-2
2015.4.16 (UTC)
NT15-07
CPT2-1
Min 6kN
Min 8kN
Min 5kN
Min 5kN
Max 11kN
Max 10kN
Max 11kN
Max 11kN
着底
着底
着底

Piston core winch tension records

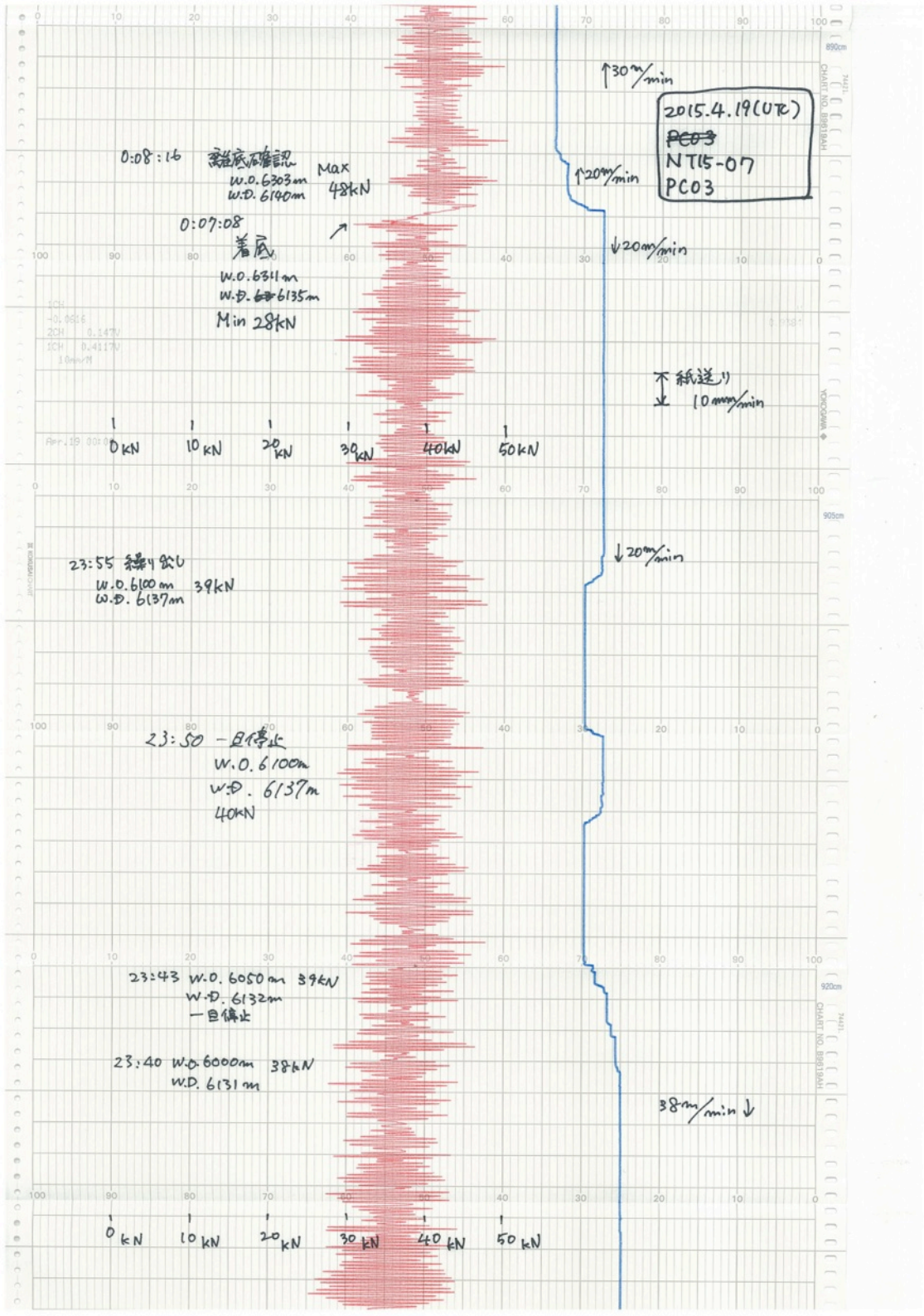
PC01


2015.4.17 (UTC)
NT15-07
PC01
↑50mm/min
↑20mm/min
2:11:53 着底
W.O. 1290m
W.D. 1310m
Min 6kN
2:12:30 離底確認
W.O. 1281m
W.D. 1313m
MAX 22kN
繰り出し 10mm/min
↓20mm/min
0kN
10kN
20kN
30kN
2:07 繰り出し W.O. 1210m 14kN
W.D. 1306m
2:02 W.O. 1210m 14kN
W.D. 1315m 一旦停止
1:57 W.O. 1000m 12kN
W.D. 1309m

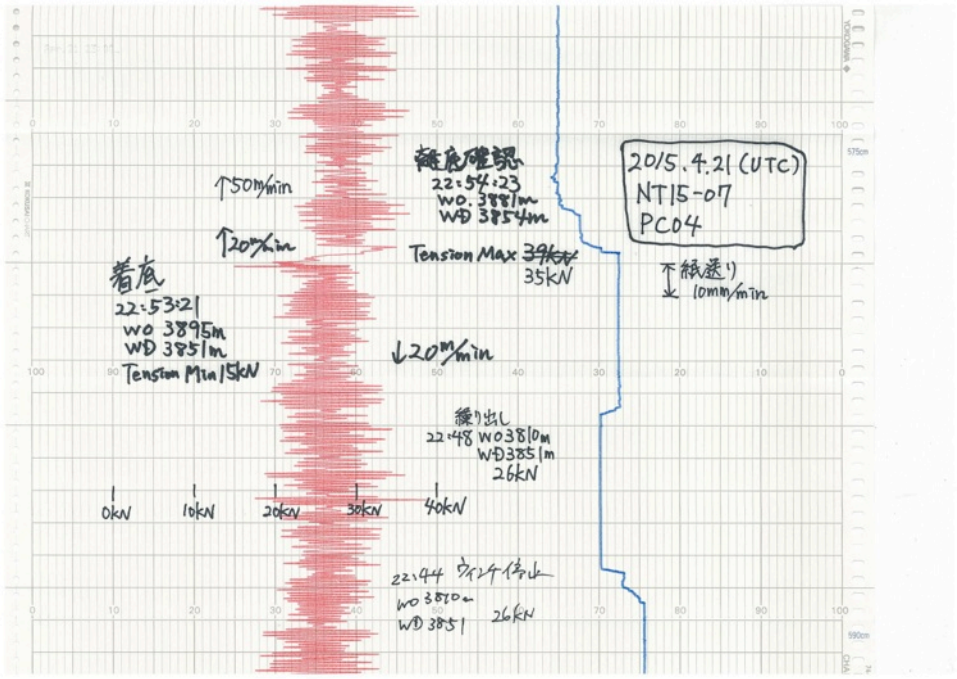
PC02


~50mm/min
4:44:05
離底確認 Max
W.O. 1375m 23kN
W.D. 1400m
2015.4.17 (UTC)
NT15-07
PC02
4:43:20 着底
W.O. 1385m
W.D. 1403m
Min 6kN
繰り出し 10mm/min
↓20mm/min
0kN
10kN
20kN
30kN
4:37 W.O. 1280m 繰り出し
W.D. 1402m 14kN
4:32 W.O. 1230m 一旦停止
W.D. 1403m 14kN

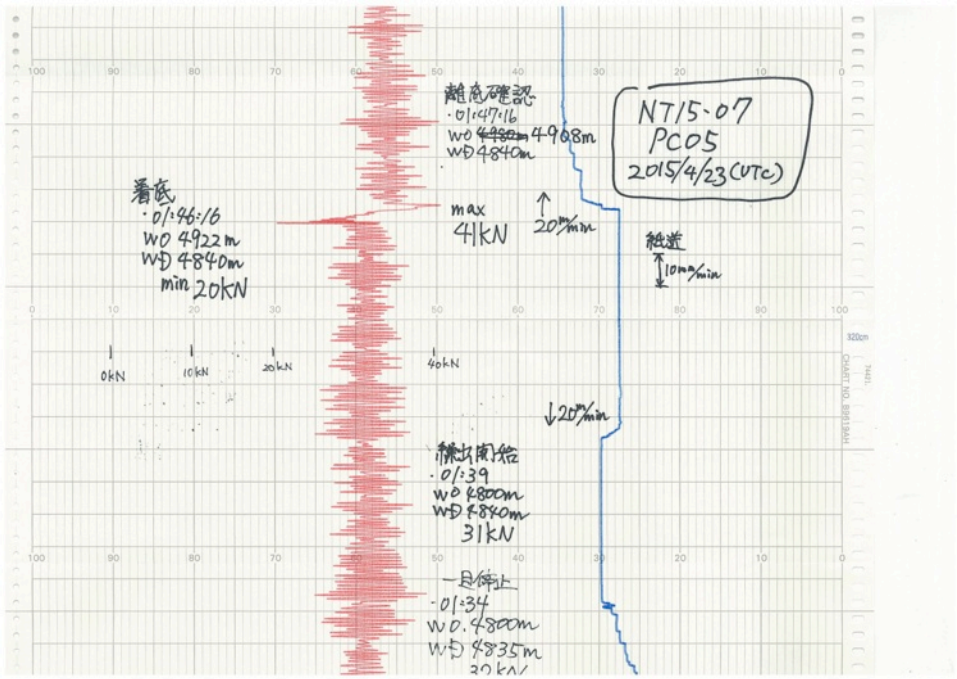
PC03


2015.4.19(UTC)
~~PC03~~
NT15-07
PC03
0:08:16 着底確認
W.O. 6303m
W.D. 6140m
Max 48kN
0:07:08 着底
W.O. 6311m
W.D. 6135m
Min 28kN
23:55 繰り出し
W.O. 6100m
W.D. 6137m
39kN
23:50 一旦停止
W.O. 6100m
W.D. 6137m
40kN
23:43 W.O. 6050m 39kN
W.D. 6132m
一旦停止
23:40 W.O. 6000m 38kN
W.D. 6131m
↑30m/min
↑20m/min
↓20m/min
紙送り
10mm/min
↓20m/min
38m/min ↓
0kN 10kN 20kN 30kN 40kN 50kN

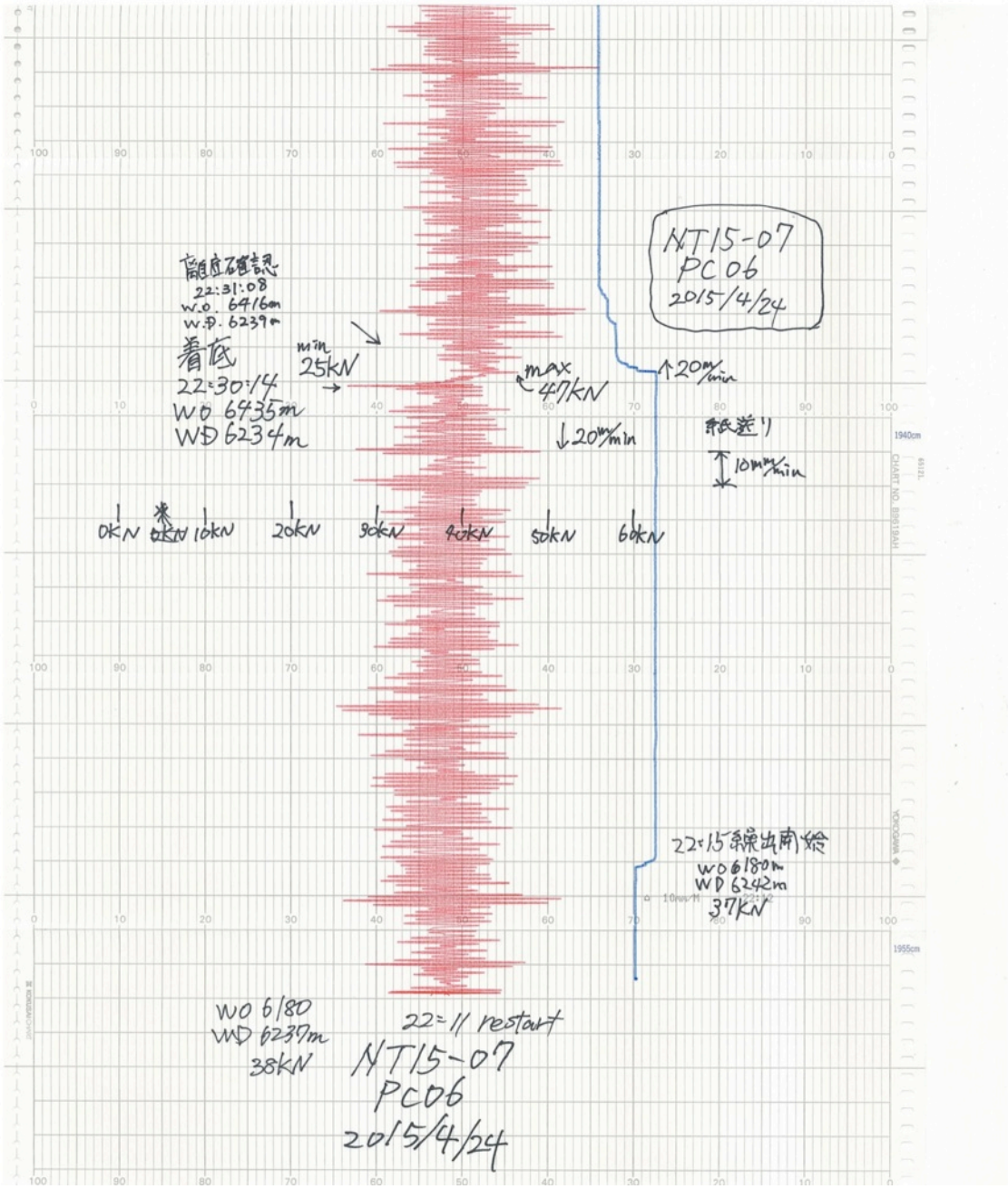
PC04


↑50m/min
↑20m/min
着底
22:53:21
WO 3895m
WD 3851m
Tension Min 15kN
離底確認
22:54:23
WO. 3881m
WD 3854m
Tension Max 39kN
35kN
2015.4.21 (UTC)
NT15-07
PC04
↓20m/min
繰り出し
22:48 WO3810m
WD3851m
26kN
0kN
10kN
20kN
30kN
40kN
22:44 ウインチ停止
WO 3810m
WD 3851
26kN

PC05


離底確認
・01:47:16
WO 4908m
WD4840m
NT15-07
PC05
2015/4/23(UTC)
着底
・01:46:16
WO 4922m
WD 4840m
min 20kN
max
41kN
↑20m/min
↓10m/min
0kN
10kN
20kN
40kN
↓20m/min
繰出開始
・01:39
WO 4800m
WD 4840m
31kN
一旦停止
・01:34
WO. 4800m
WD 4835m

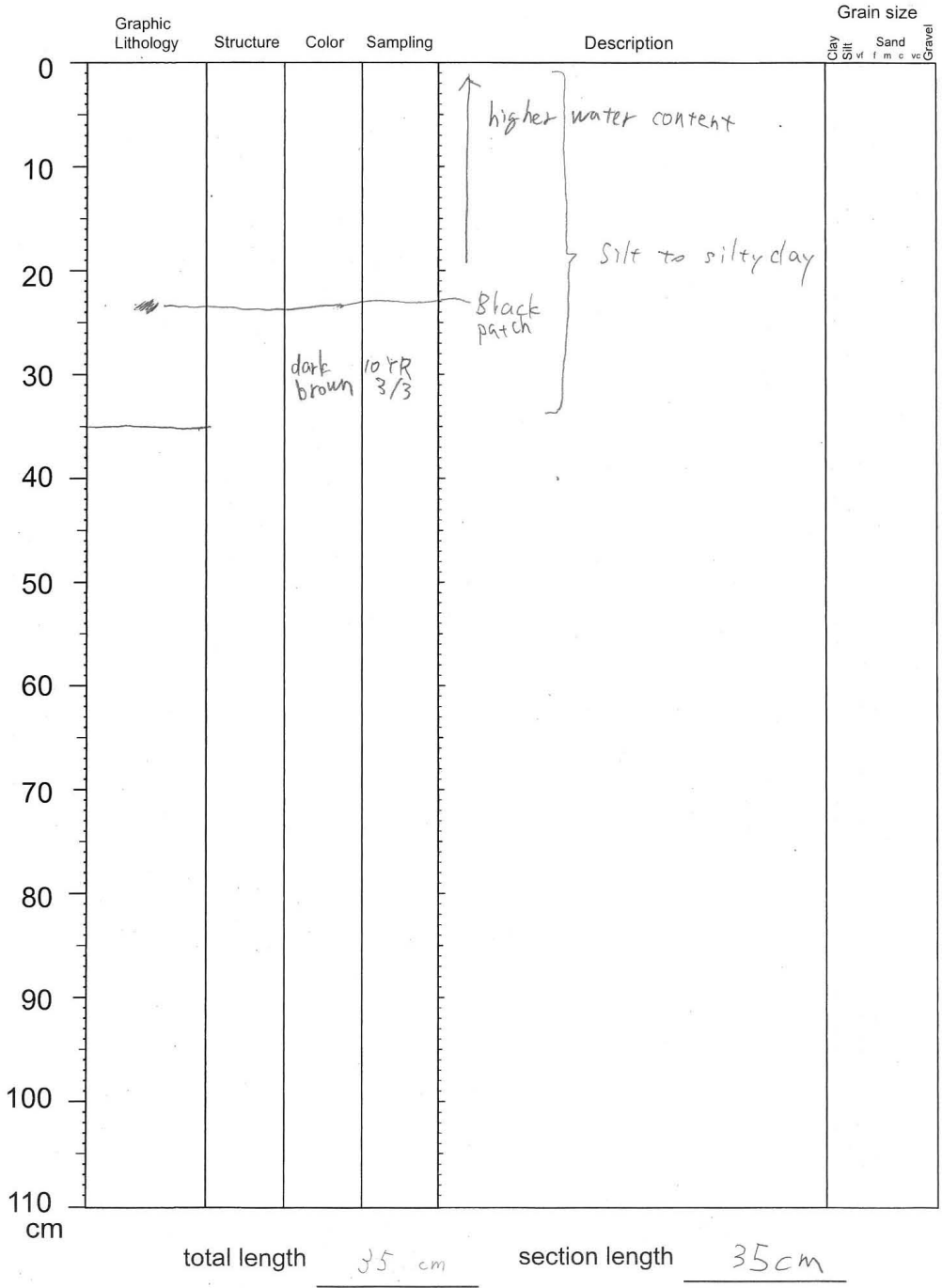
PC06


NT15-07
PC06
2015/4/24
着底
22:30:14
WO 6435m
WD 6234m
min
25kN
max
47kN
20m/min
20m/min
10mm/min
0kN
10kN
20kN
30kN
40kN
50kN
60kN
22:15 離出開始
WO 6180m
WD 6242m
37kN
WO 6180
WD 6239m
38kN
22:11 restart
NT15-07
PC06
2015/4/24

Visual Core Description

CORE: NT15-07 PC01 Date: 18 Apr. 2015

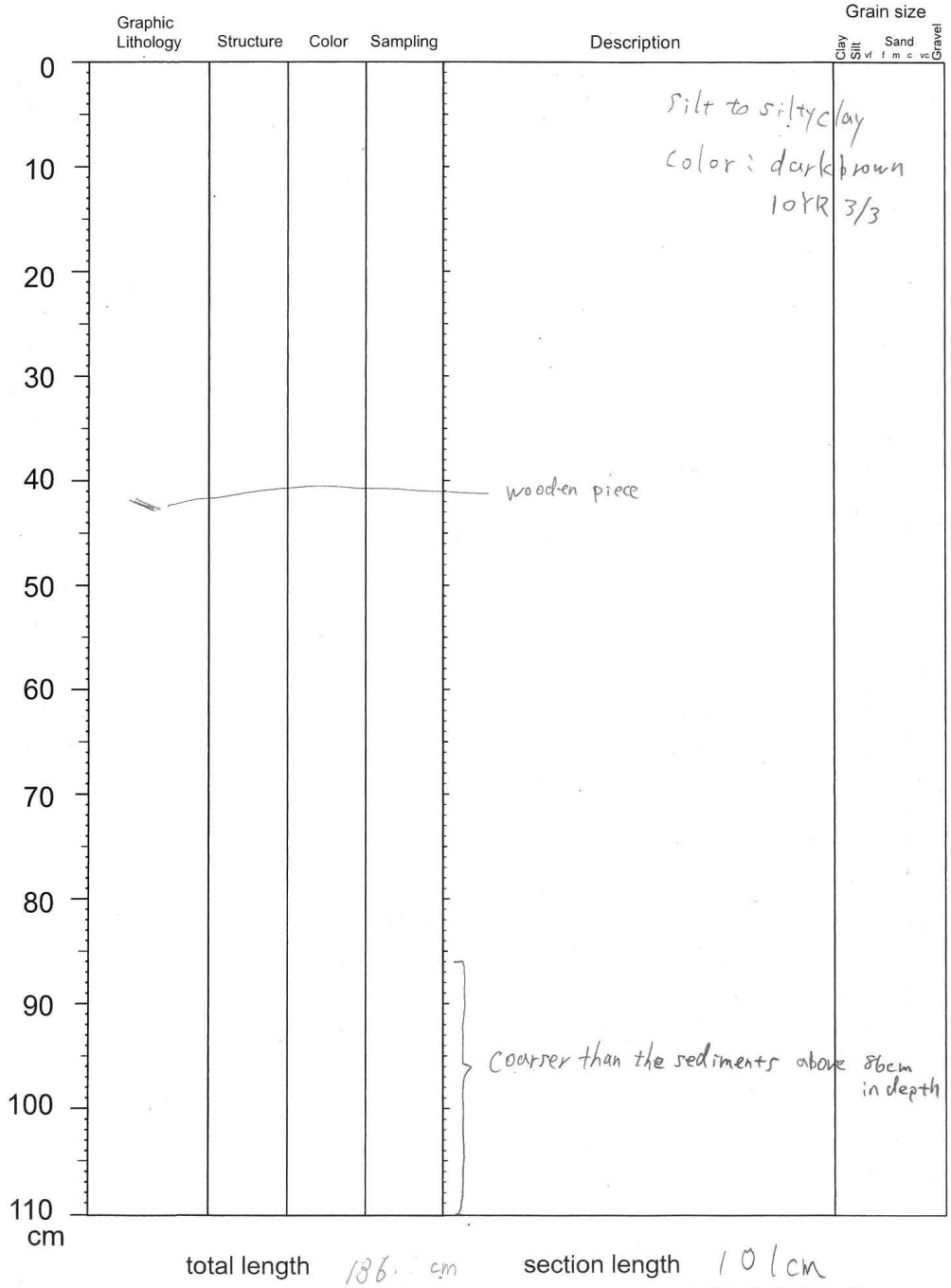
Section: 2 A / W by: Shuro Yoshikawa



total length 35 cm section length 35cm

CORE: NT15-07 PC01 Date: 18 Apr. 2015

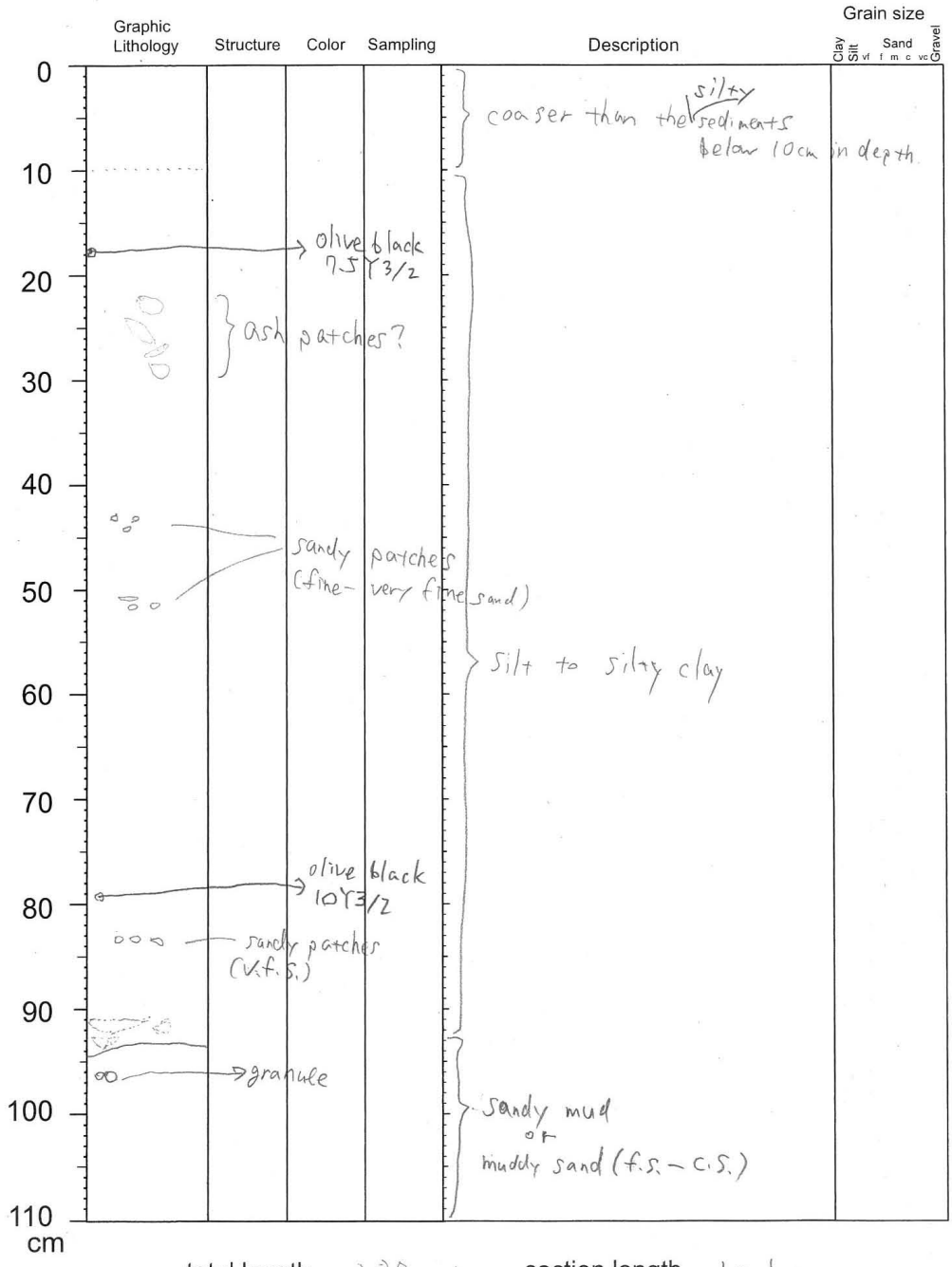
Section: 3 A / W by: Sharo Yoshikawa



total length 136. cm section length 101cm

CORE: NT15-07 PC01 Date: 18 Apr. 2015

Section: 4 A/(W) by: Shuro Kashikawa



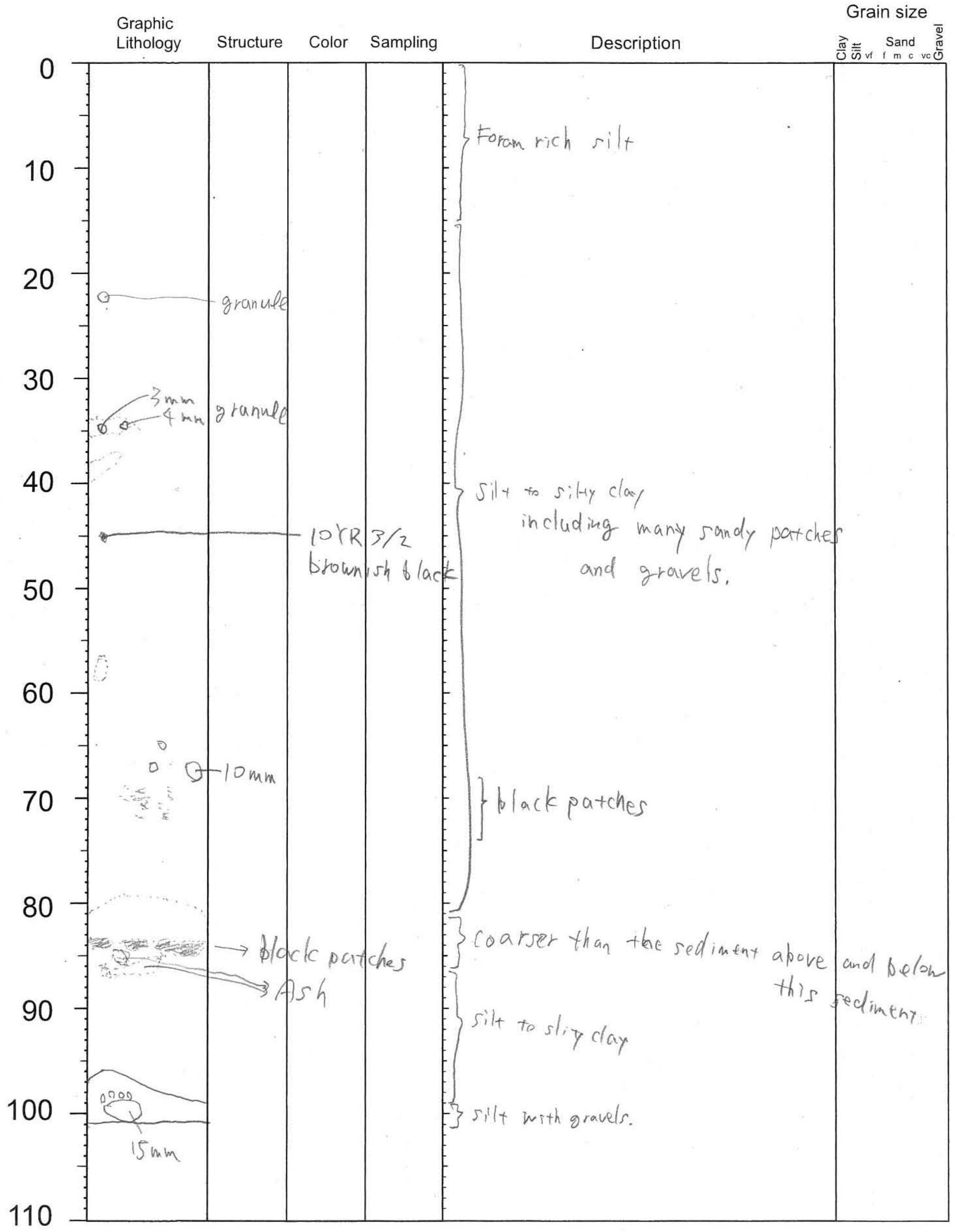
total length 287 cm section length 101 cm

CORE: NT15-07 PC01

Date: 18 Apr. 2015

Section: 5 A / W

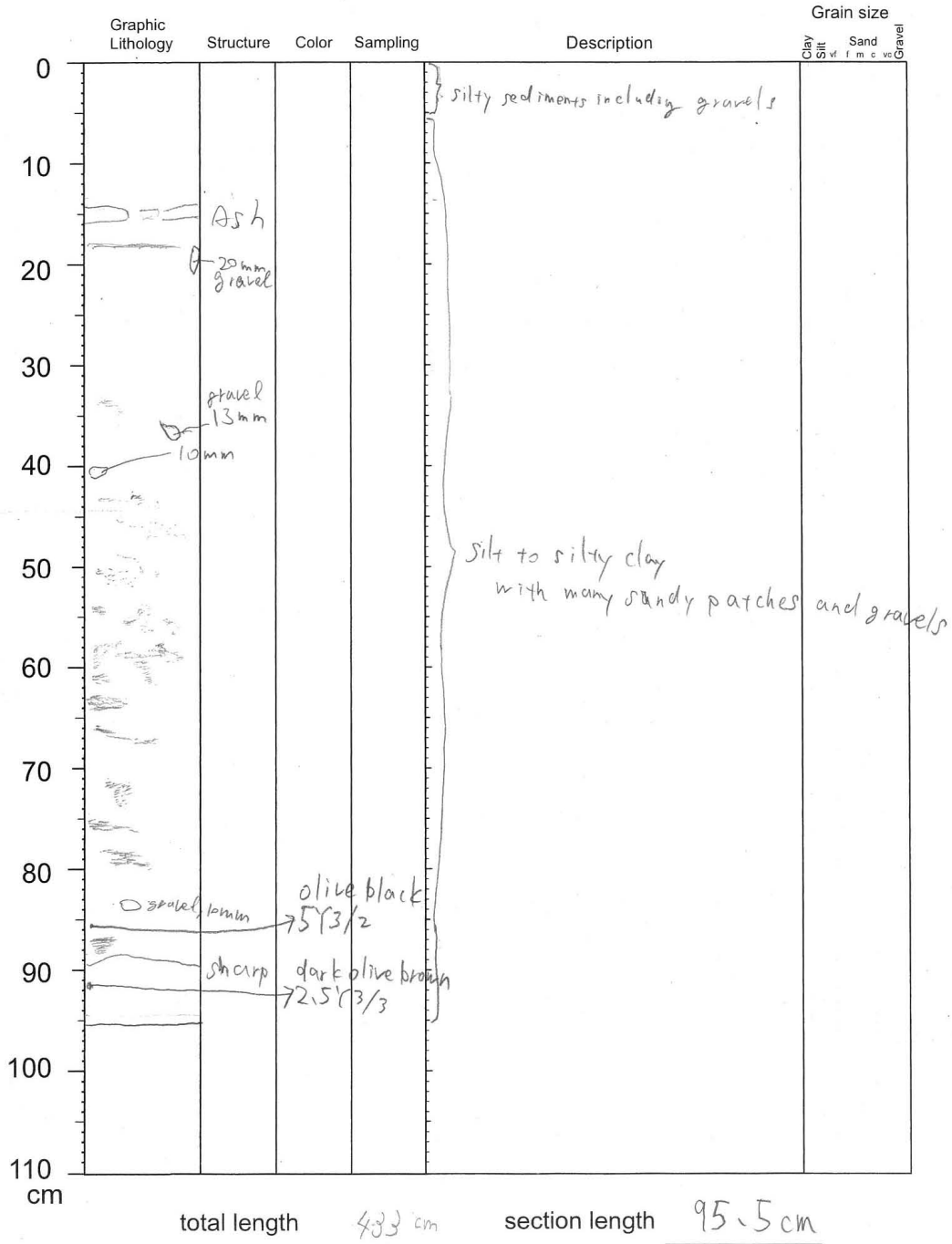
by: Shono Yoshikawa



total length 337.5 cm section length 100.5cm

CORE: NT15-07 PC01 Date: 18 Apr. 2015

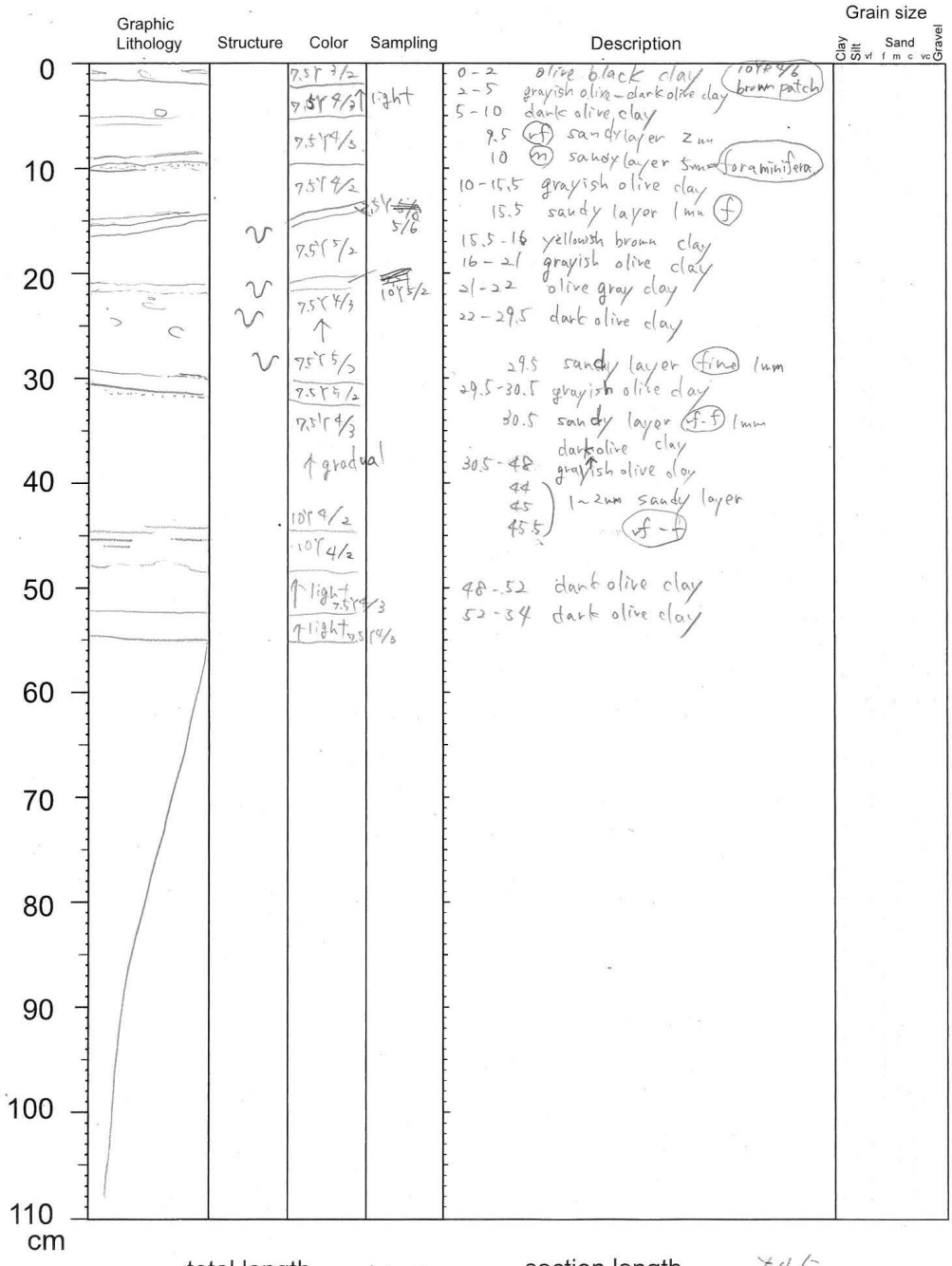
Section: 6 A/(W) by: Shuro Yoshikawa



total length 433 cm section length 95.5 cm

CORE: NT15-7 PL03 Date: 2015/4/20

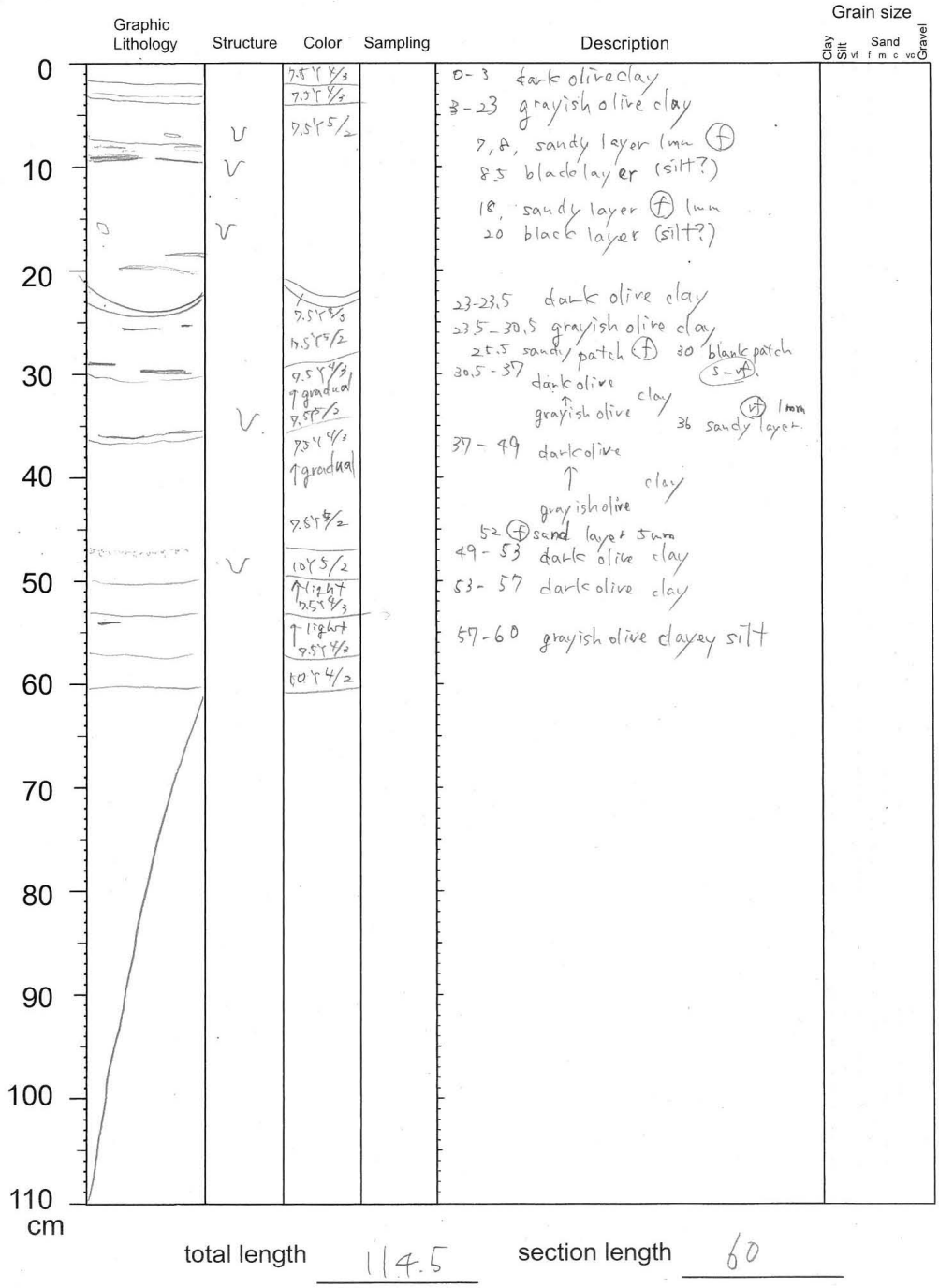
Section: 1 (A) W by: K. Arai



total length 54.5 section length 54.5

CORE: NT15-07 PL03 Date: 2015/K/20

Section: 2 (A)/W by: K Arai



total length 114.5 section length 60

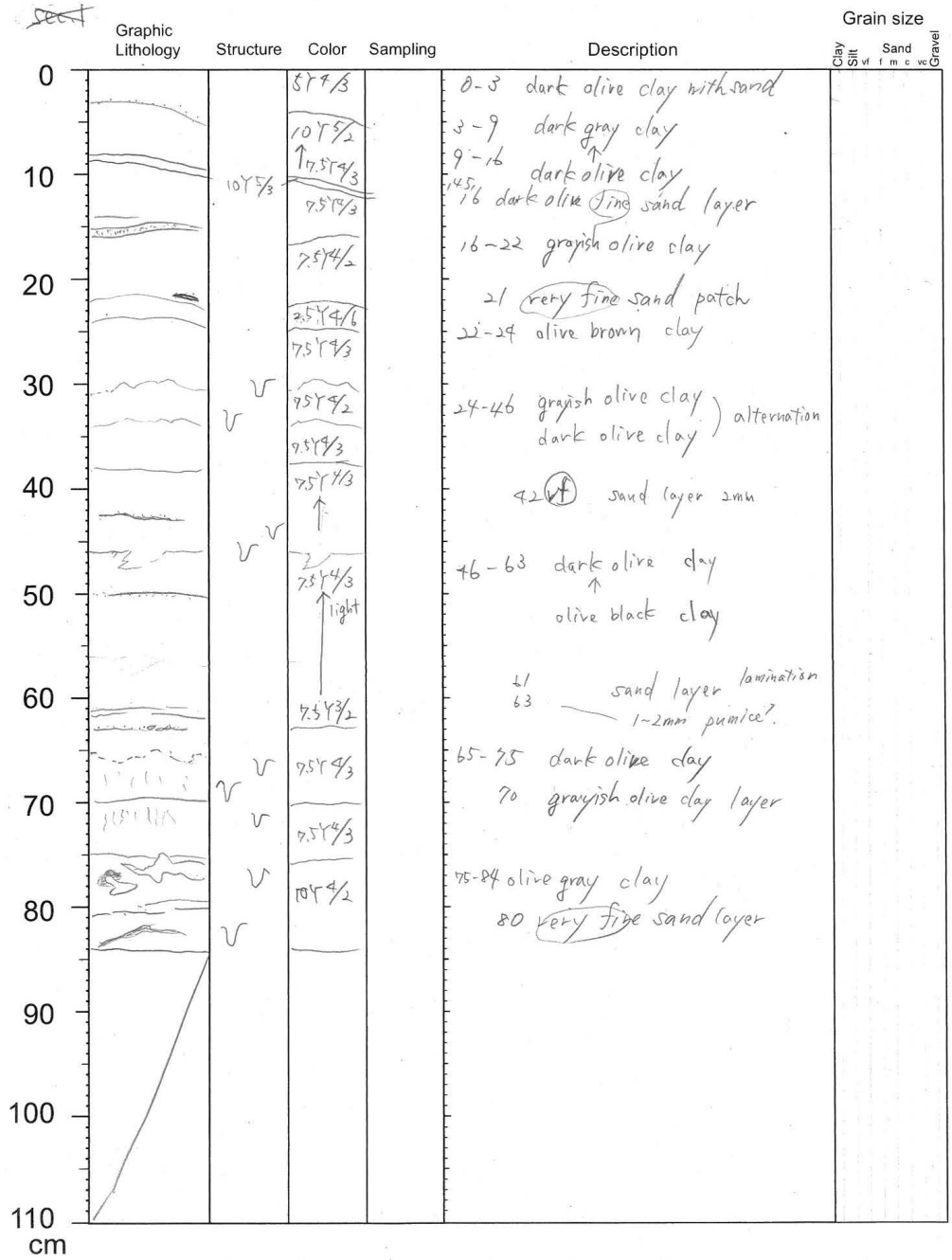
NTS-07

CORE: PC03

Date: 2015/4/20

Section: 2 (A)/W

by: K. Arai



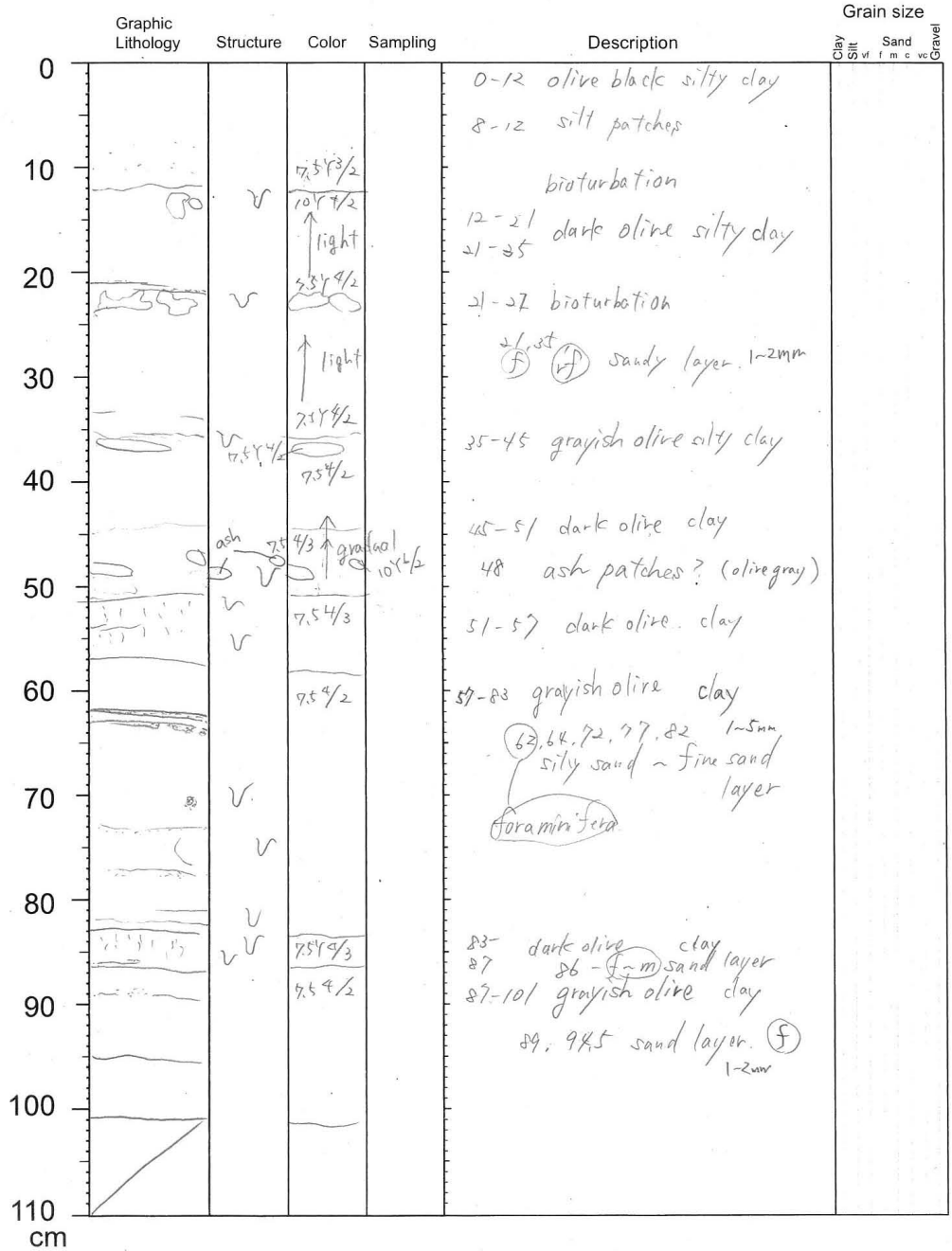
total length 84 cm

section length 84

NT13-07

CORE: PC03 sec.3 Date: 2015/4/20

Section: 3 (A)/W by: K. Arai



total length 185 section length 101

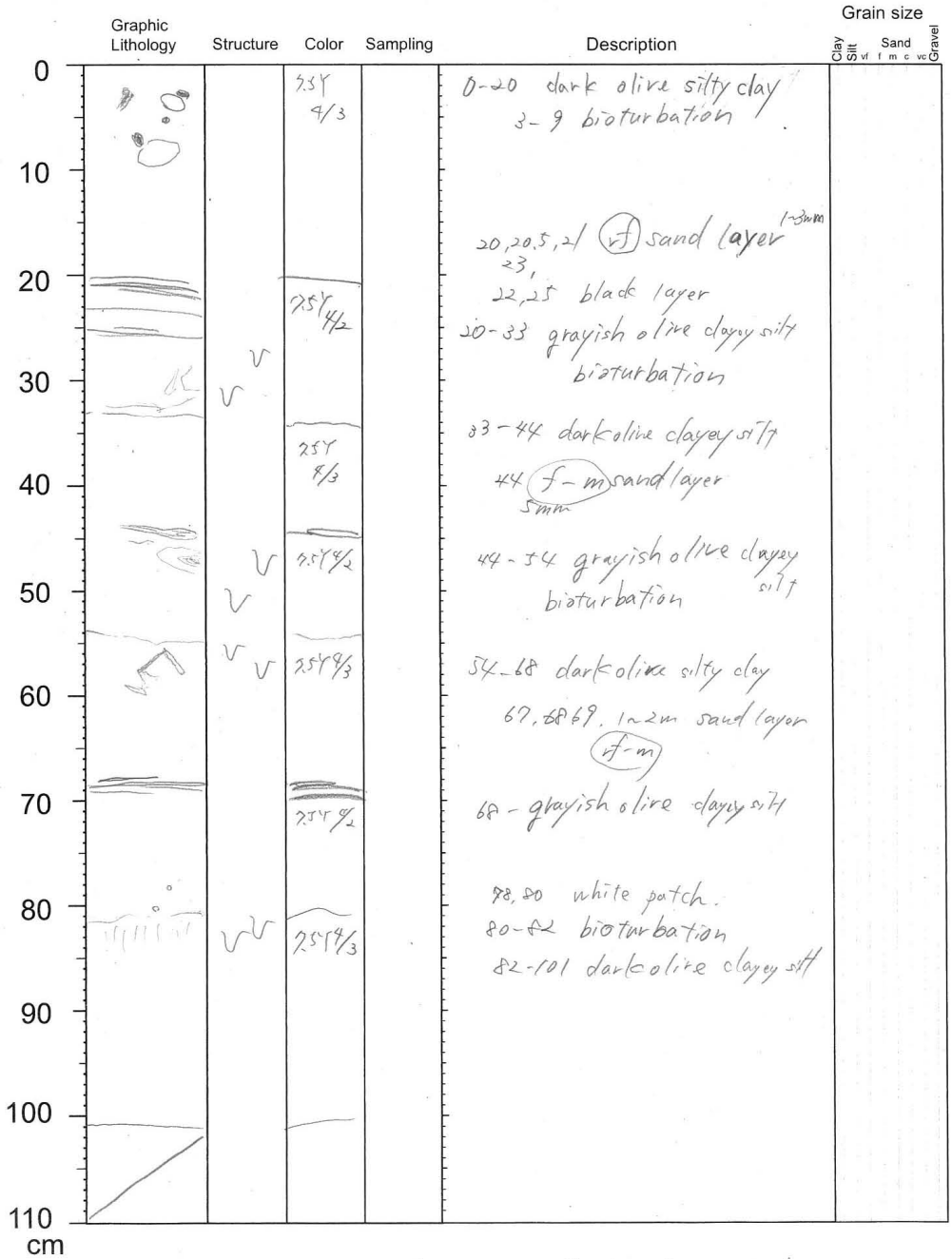
NT15-07

CORE: PC03

Date: 2015/4/20

Section: 4 (A) / W

by: K. Arai



total length 286

section length 101

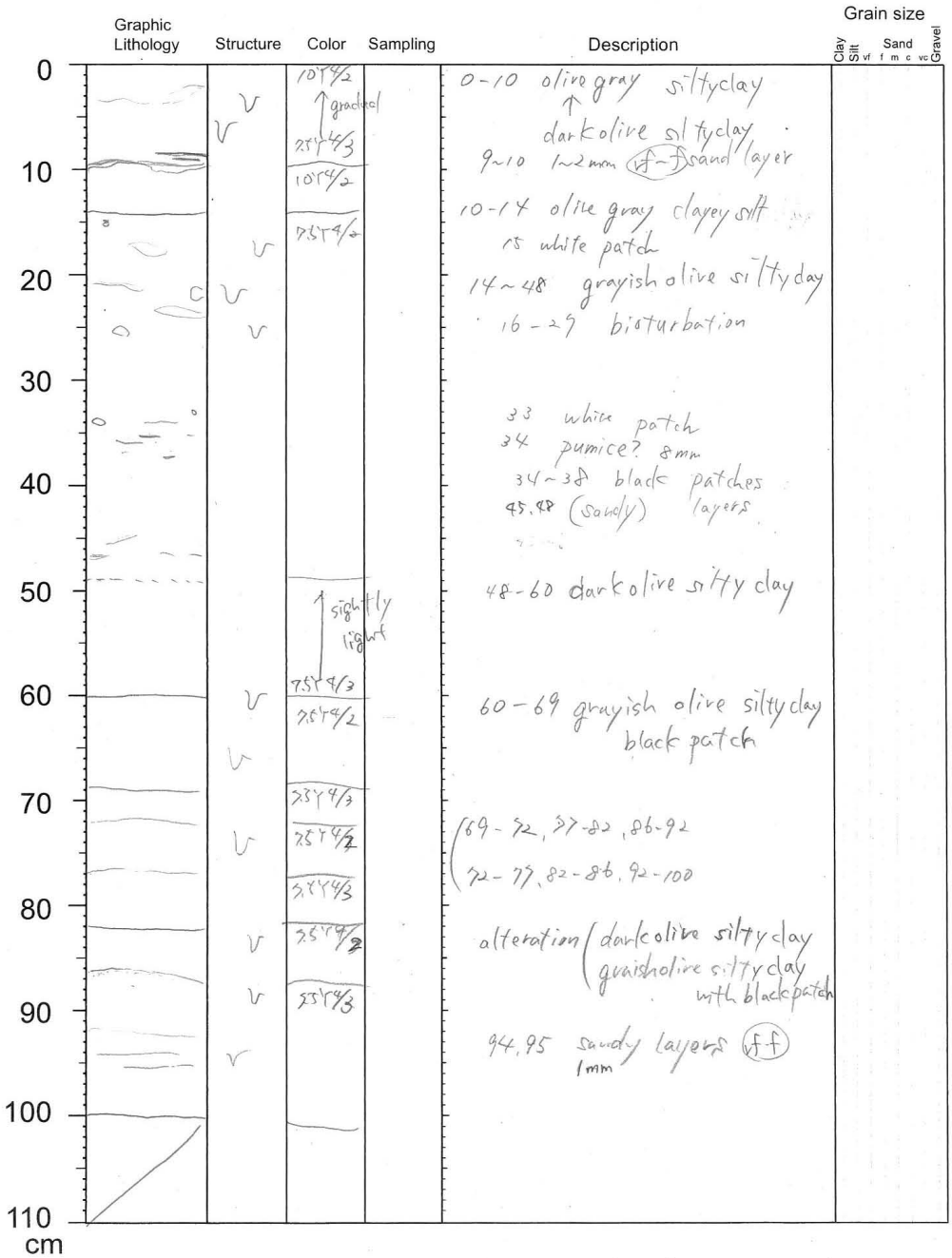
NT15-07

CORE: PC03

Date: 2015/4/20

Section: 5 (A) / W

by: K. Arai



total length 386

section length 100

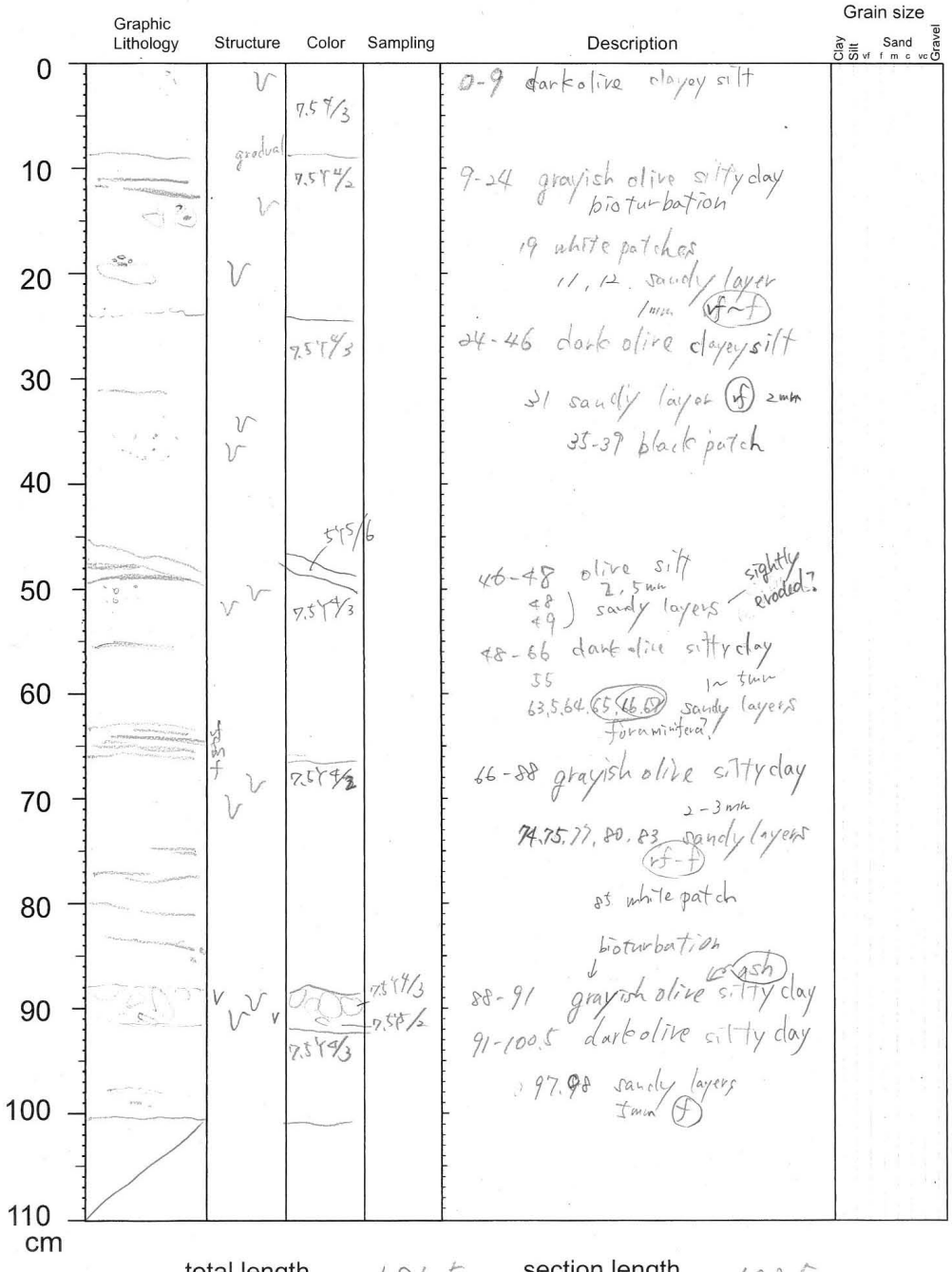
NT15-07

CORE: PC03

Date: 2015/4/26

Section: 6 (A) / W

by: K. Arai

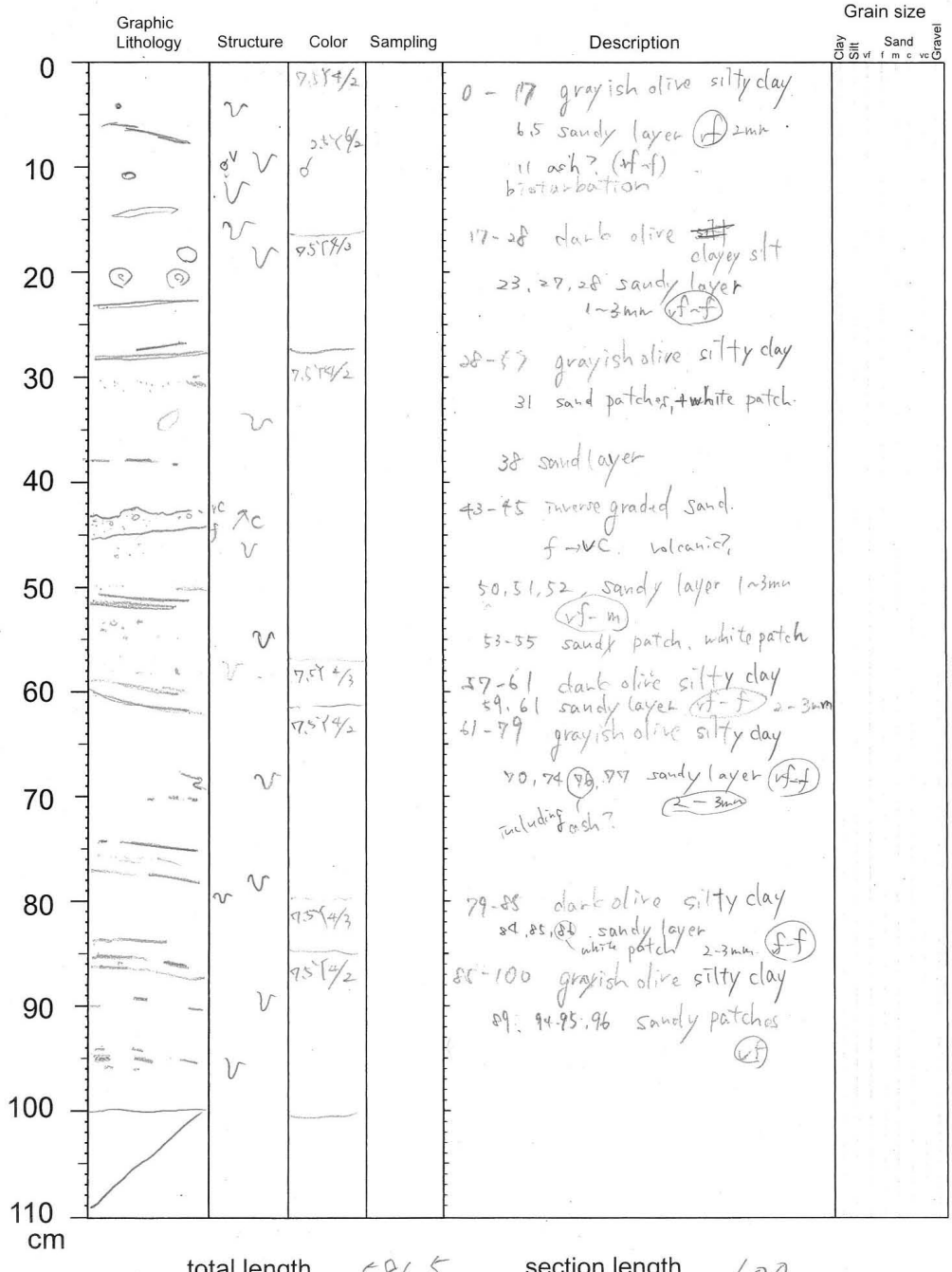


total length 486.5

section length 100.5

CORE: NT15-07 pc03 Date: 2015/4/20

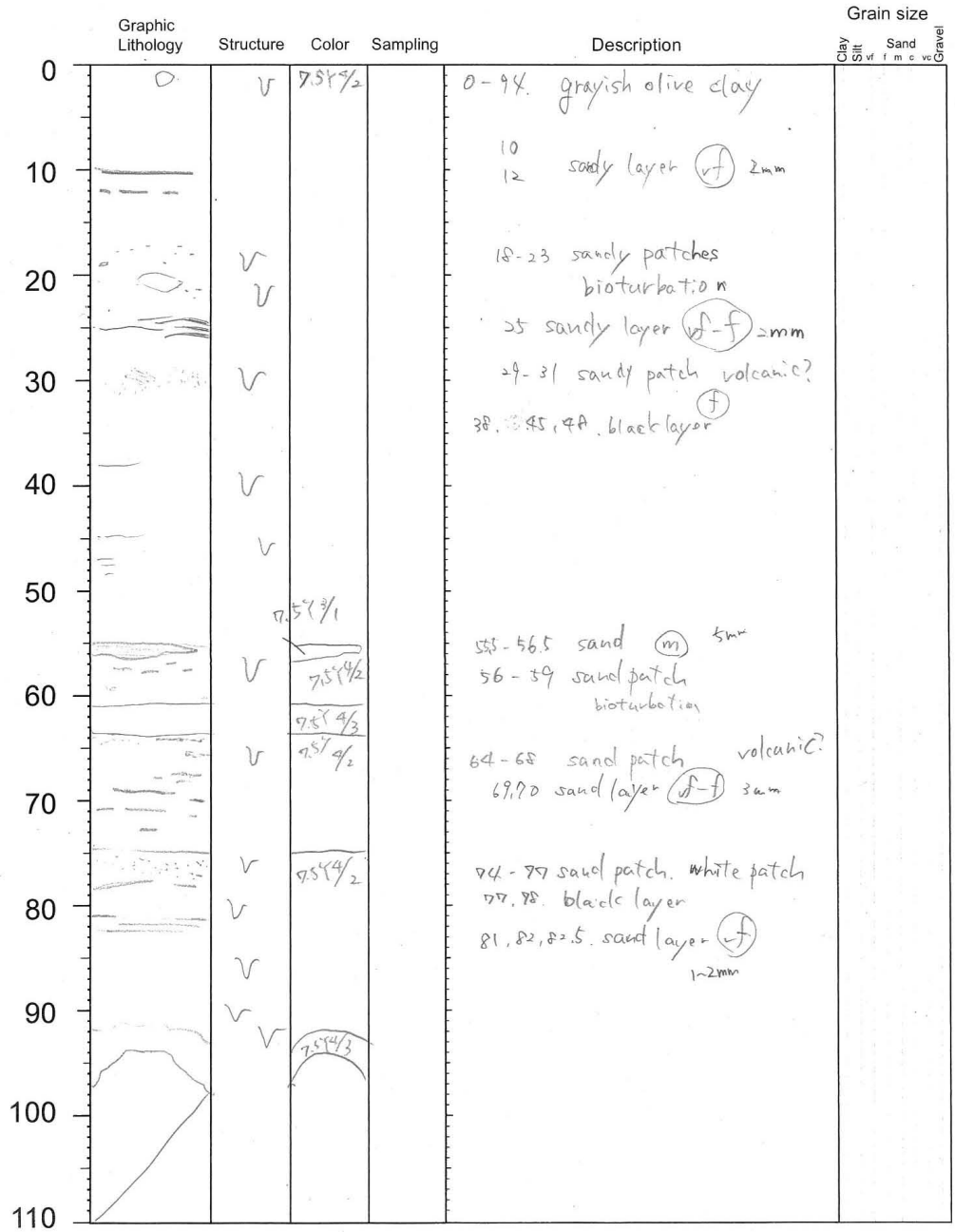
Section: 7 (A) / W by: K. Arai



total length 586.5 section length 100

CORE: NT15-07 PC03 Date: 2015/4/20

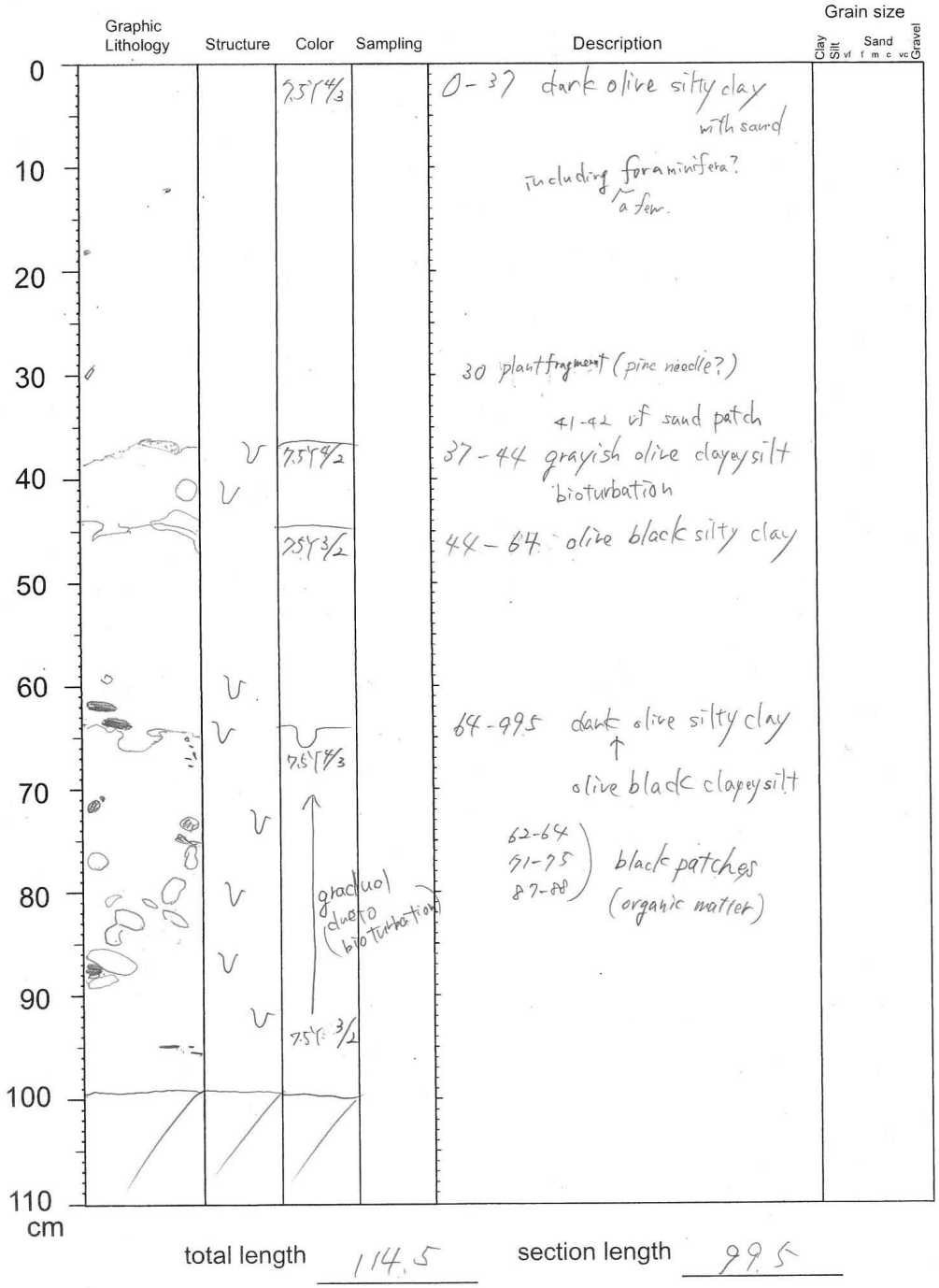
Section: 8 A / W by: K. Arai



total length 681 section length 94.5

CORE: NT15-07 P04 Date: 2015/4/22

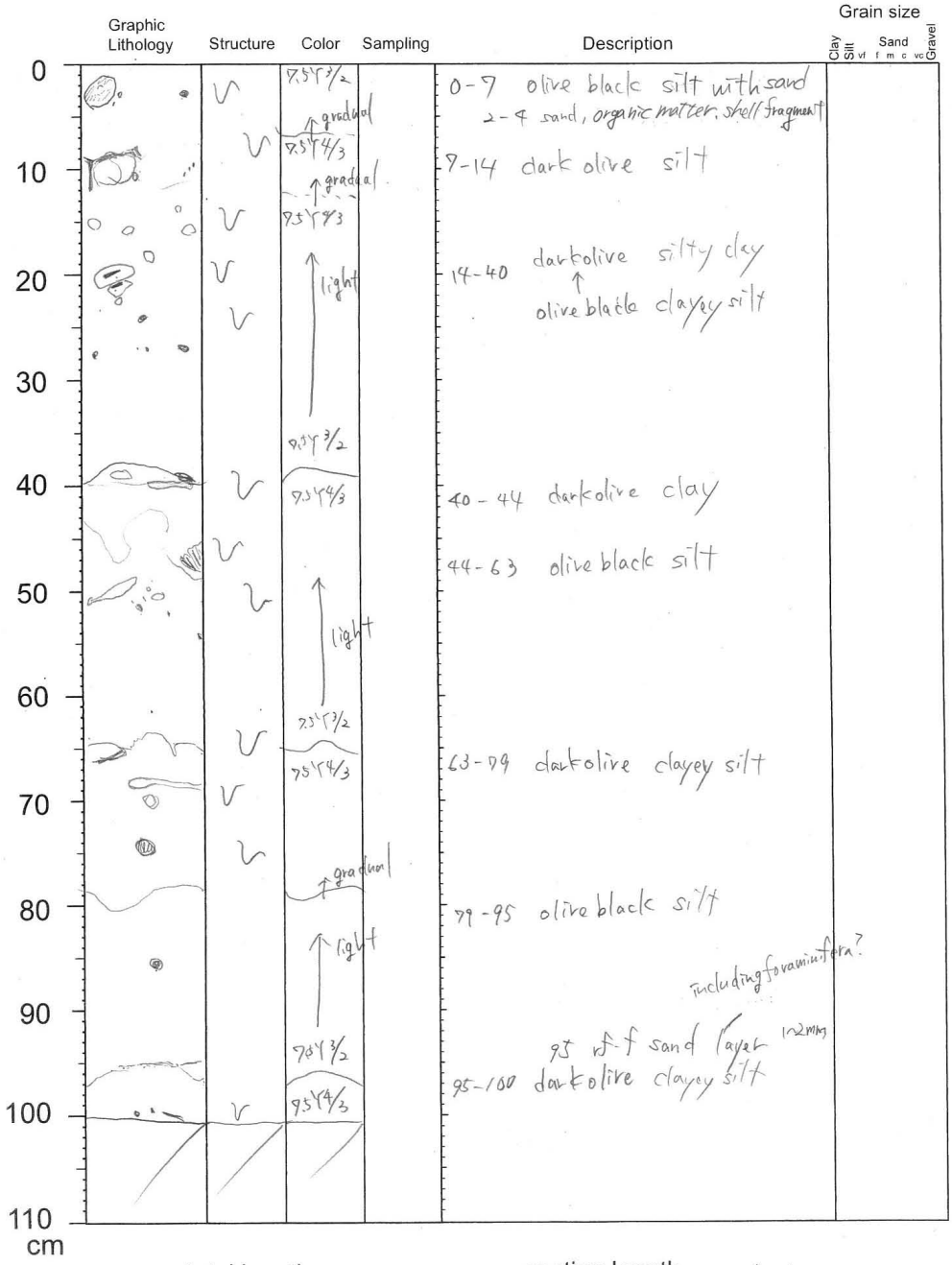
Section: 2 (A)/W by: K. Arai



total length 114.5 section length 99.5

CORE: NT15-07 PC04 Date: 2015/4/22

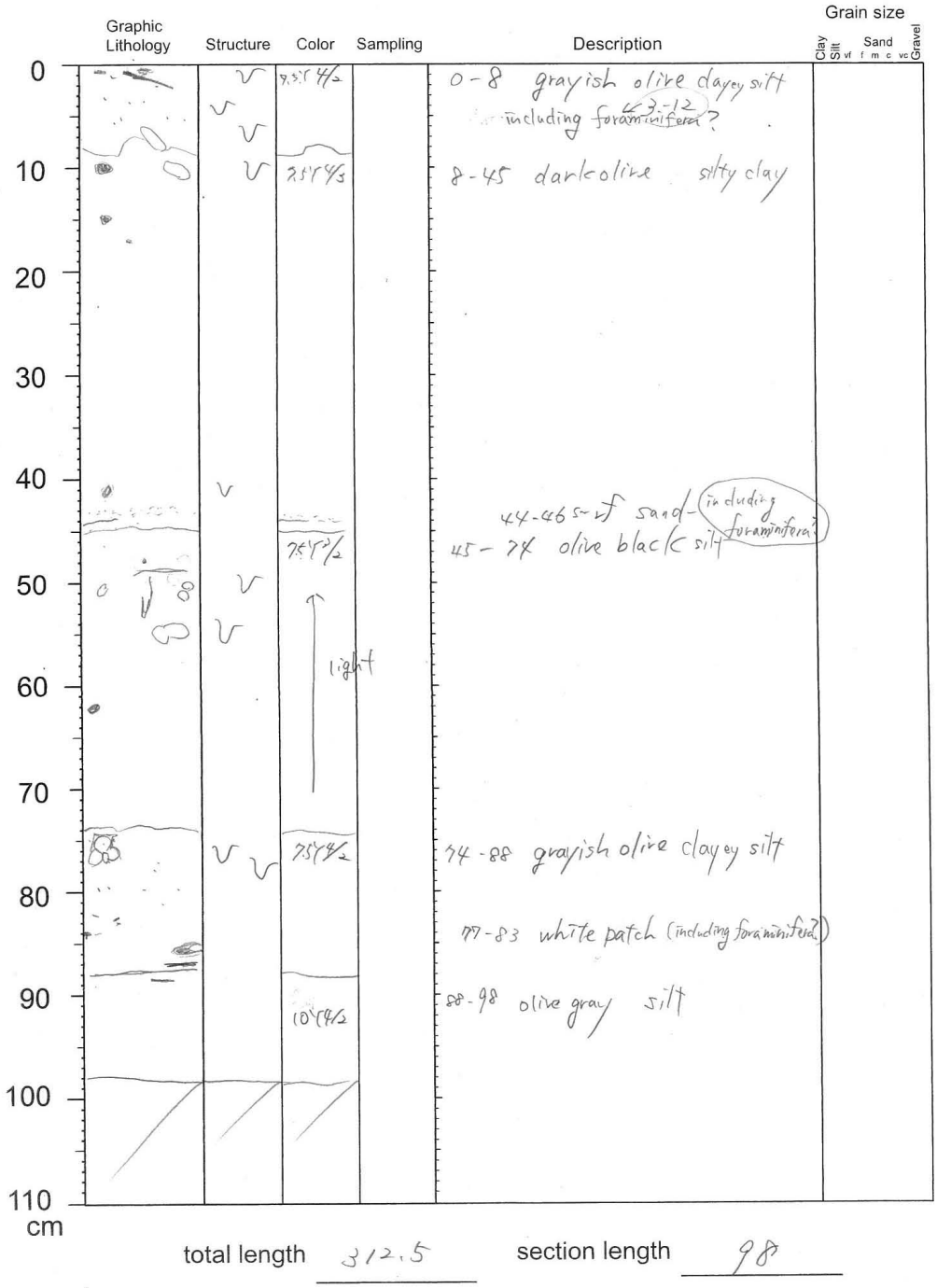
Section: 3 (A)/W by: K. Arai



total length 214.5 section length 100

CORE: NT15-07 PC04 Date: 2015/4/22

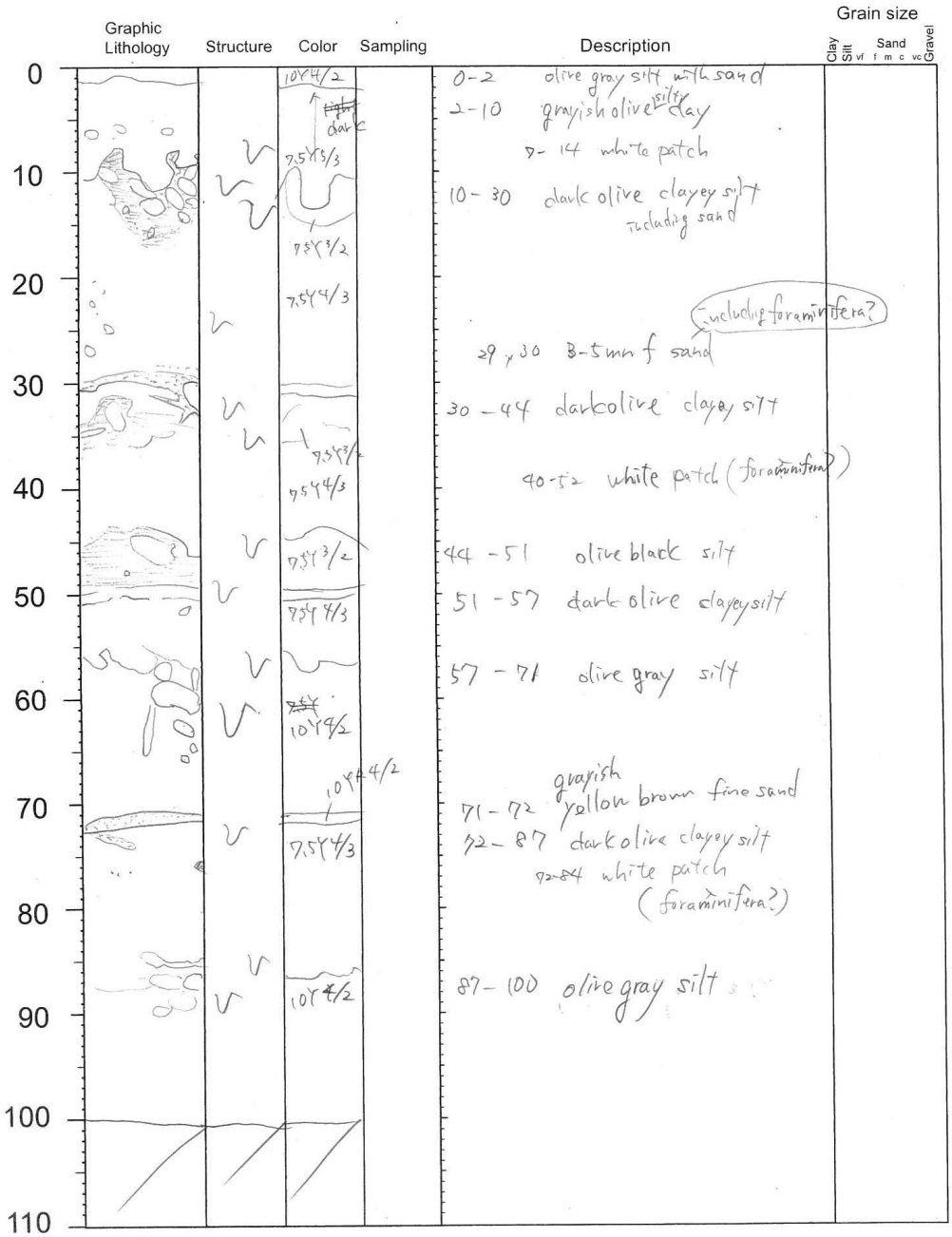
Section: 4 (A) W by: K. Arai



total length 312.5 section length 98

CORE: NT15-07 PC04 Date: 2015/4/22

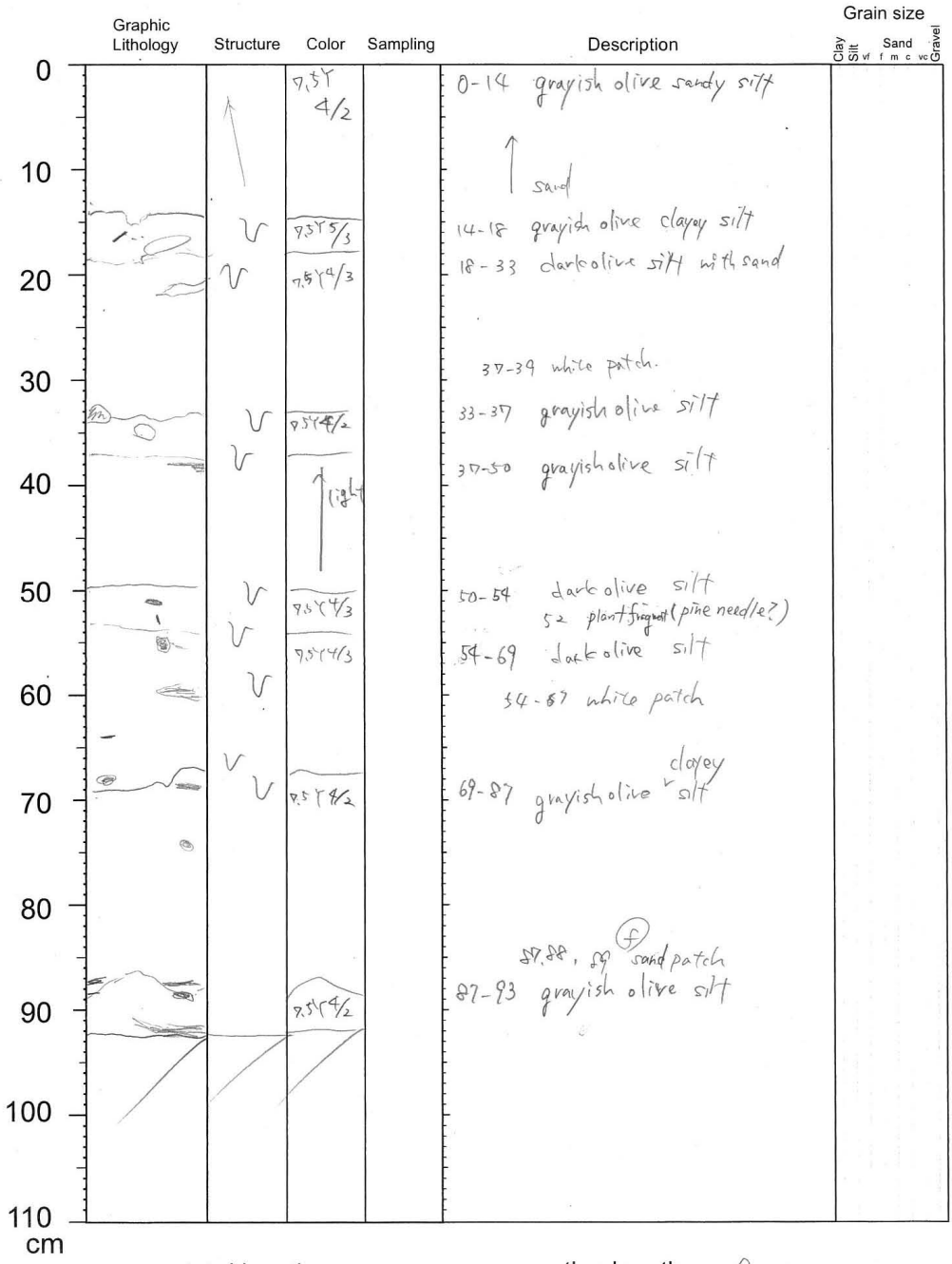
Section: 5 (A)/W by: K. Arai



total length 412.5 section length 100

CORE: NT15-07 PC04 Date: 2015/4/22

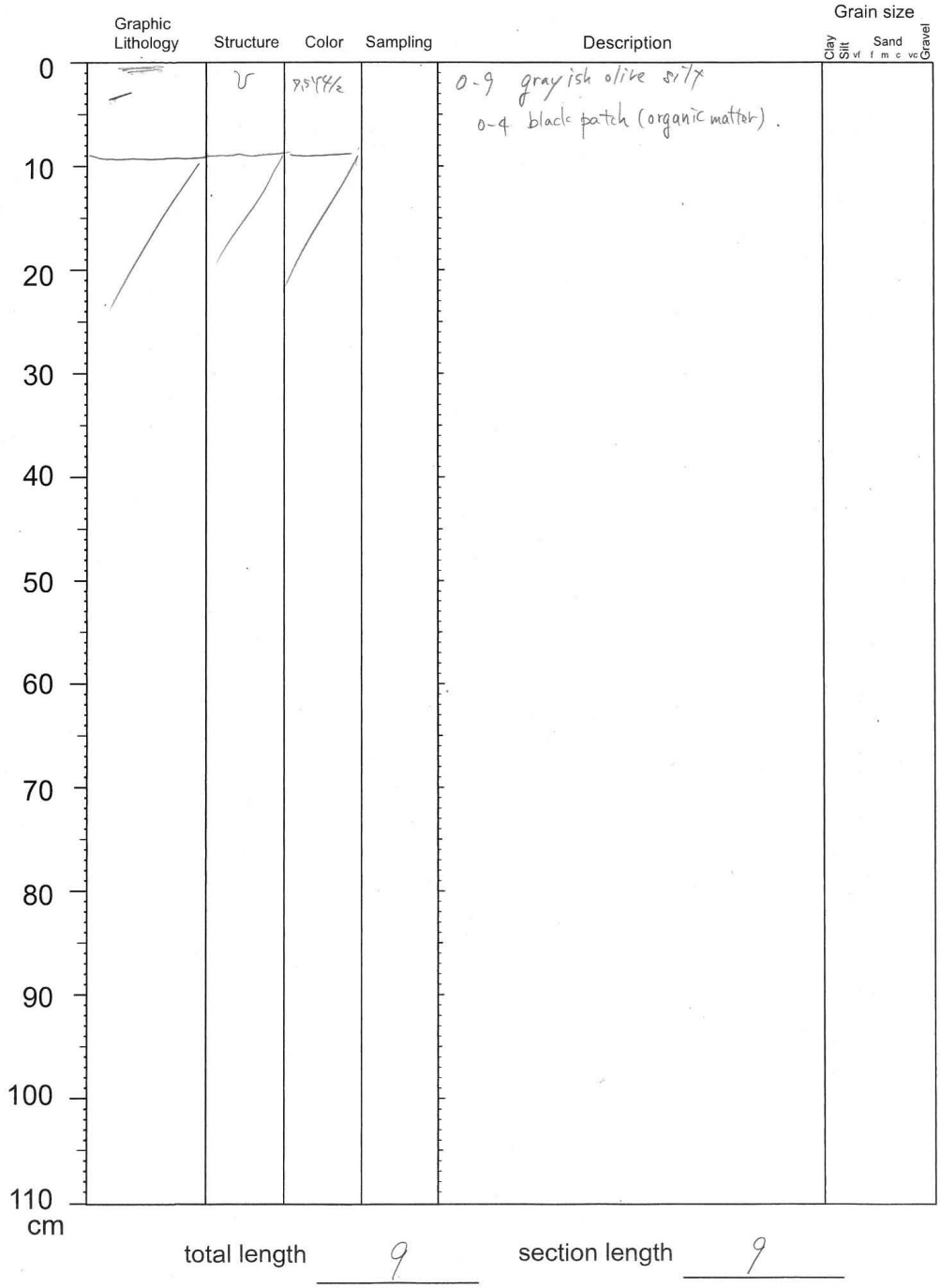
Section: 6 (A)/ W by: K. Arai



total length 505.5 section length 93

CORE: NT15-09 PC04 Date: 2015/4/22

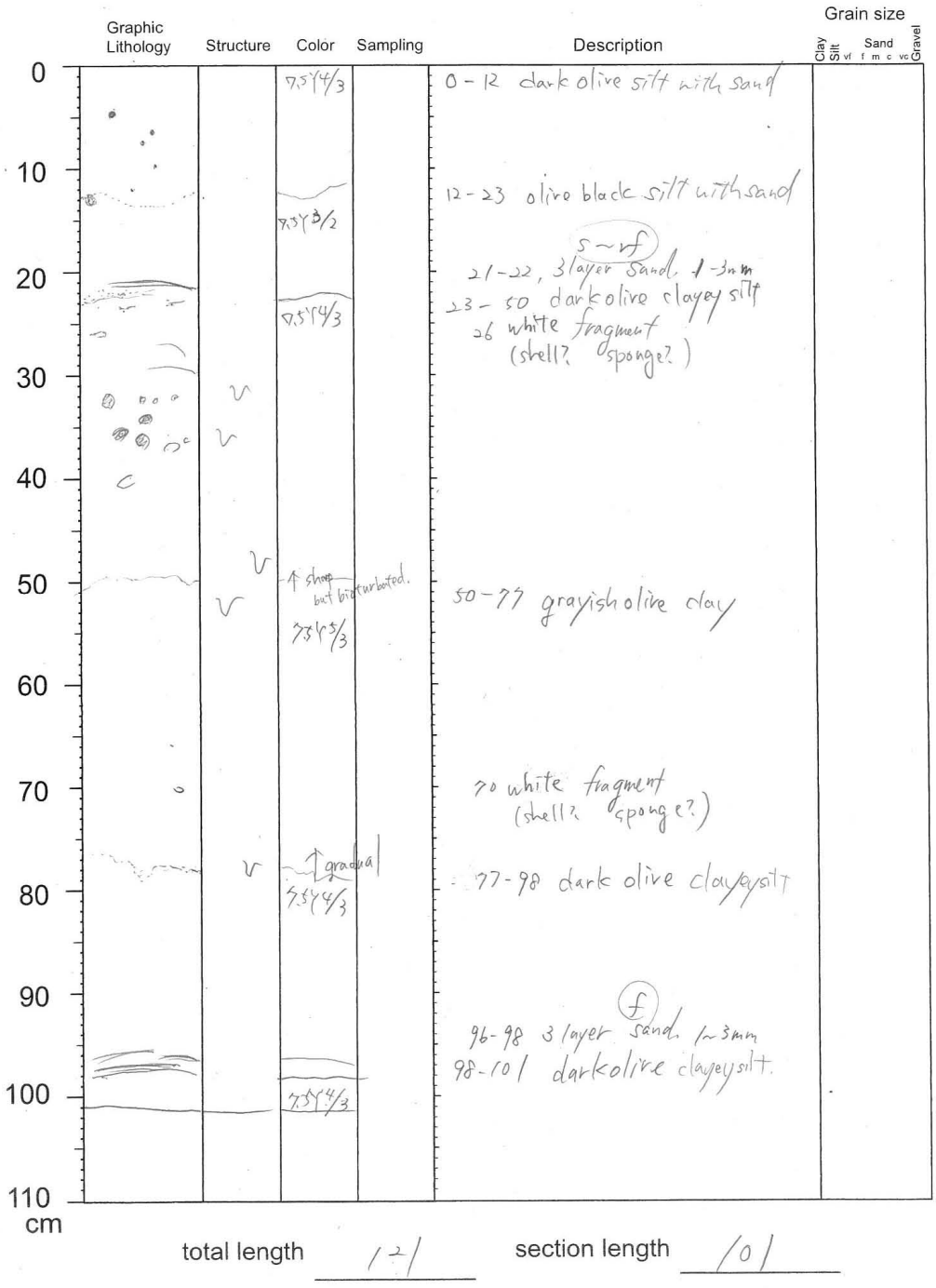
Section: CC (A) W by: K. Arai



total length 9 section length 9

CORE: NT15-07 PC05T Date: 2015/4/23

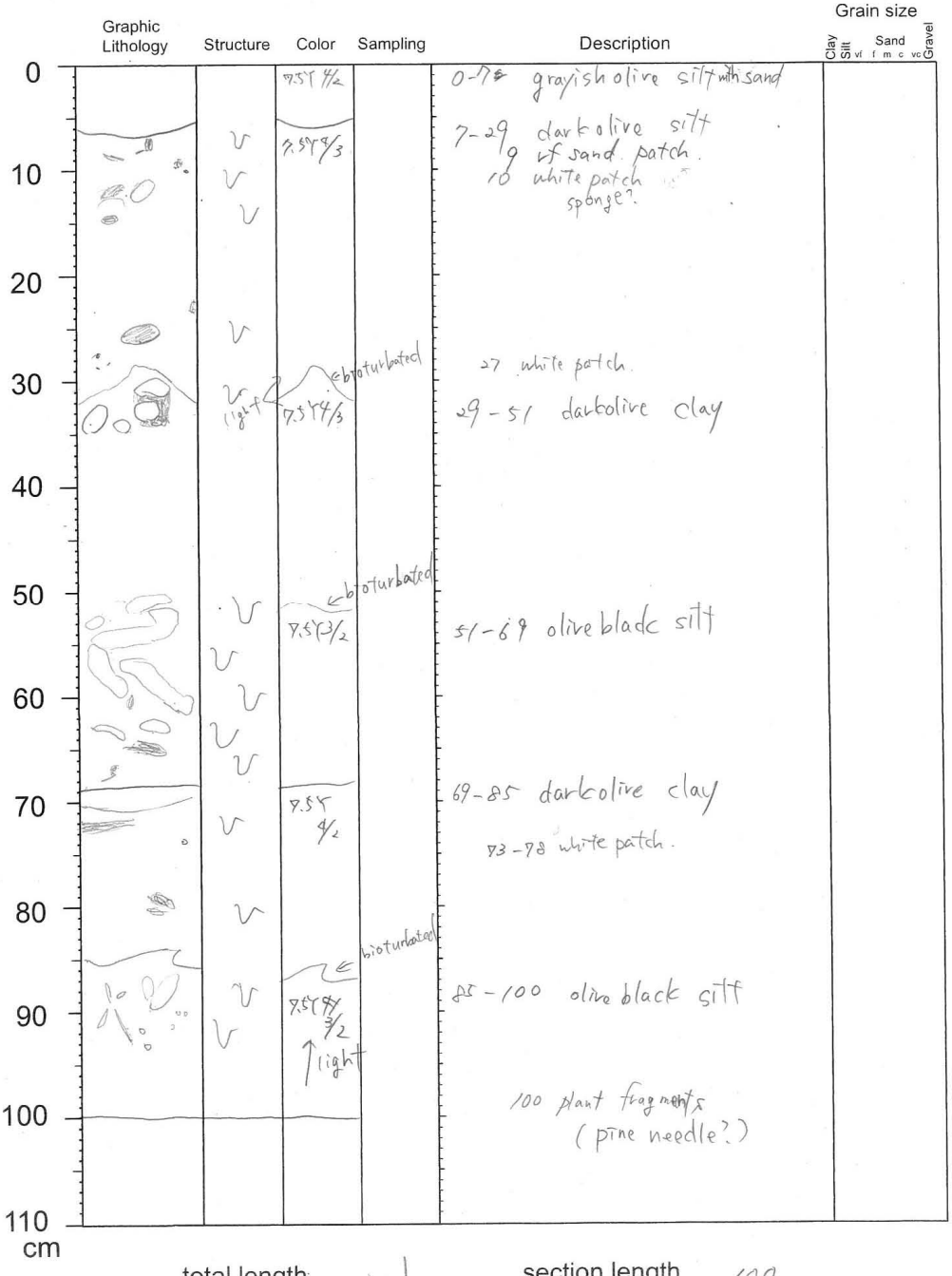
Section: 3 (A) W by: K. Arai



total length 121 section length 101

CORE: NT15-07 PC05 Date: 2015/4/23

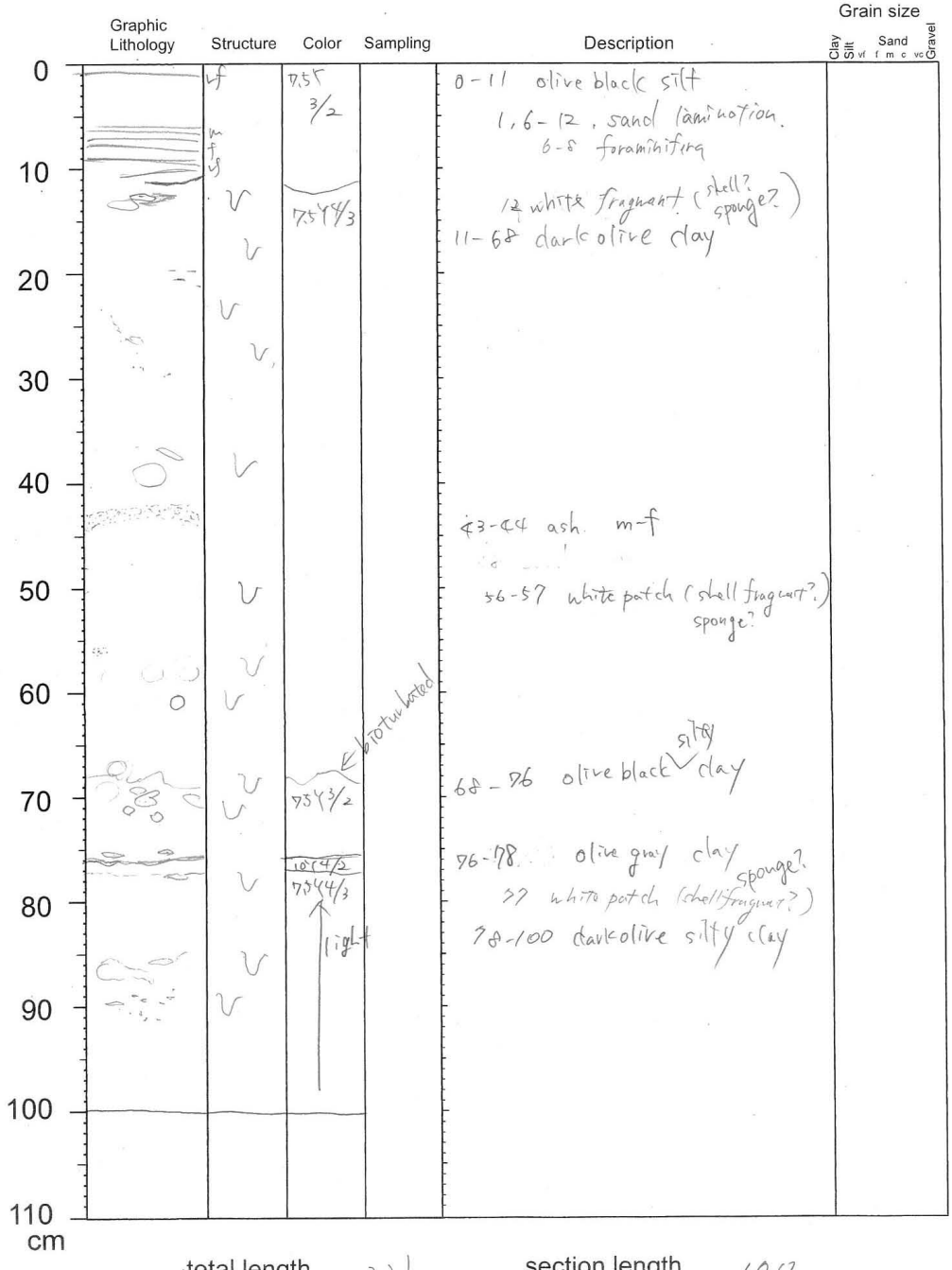
Section: 4 A / W by: K. Arai



total length 221 section length 100

CORE: NT15-07 PC05 Date: 2015/4/23

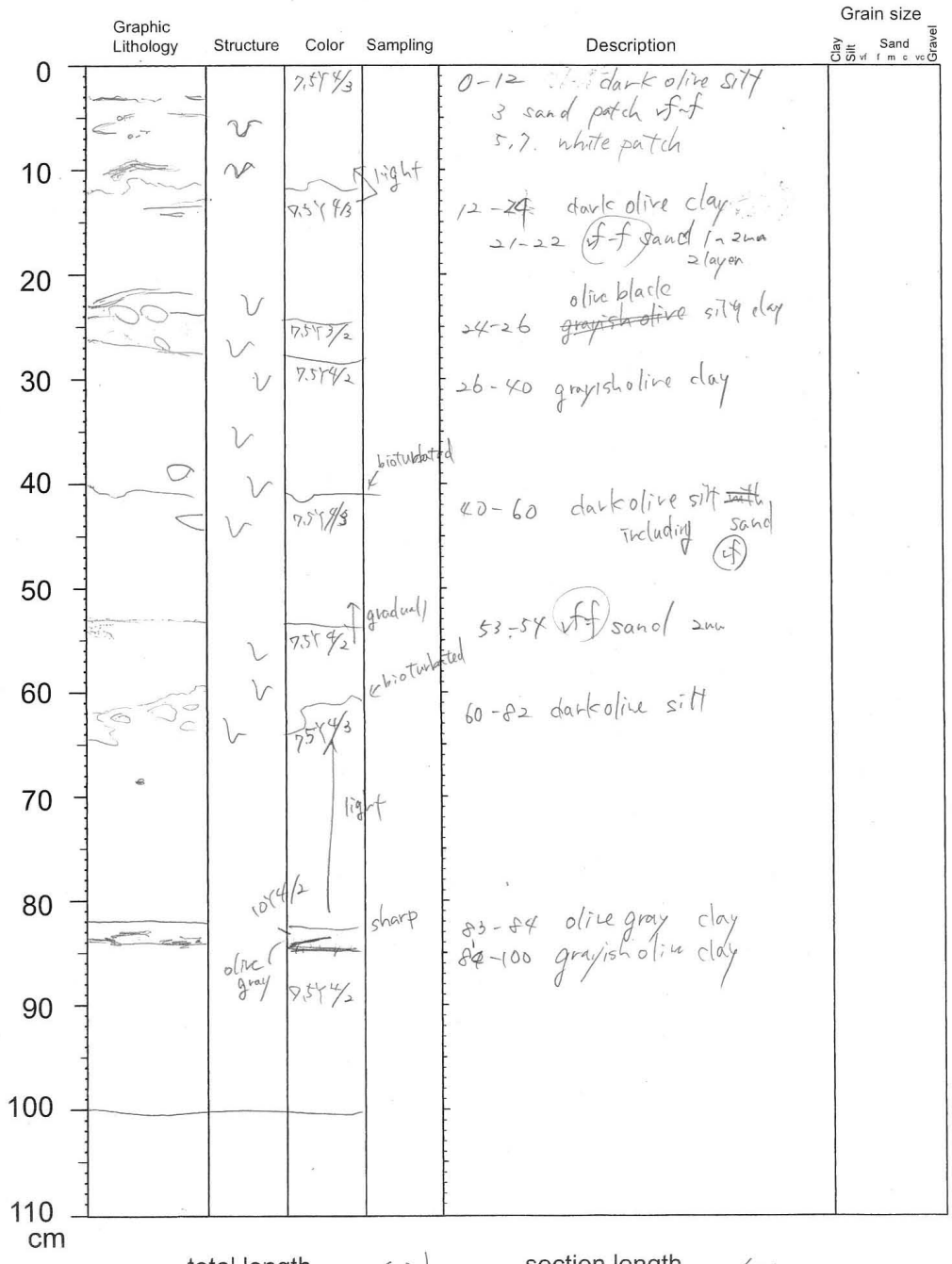
Section: 5 (A) W by: K. Arai



total length 321 section length 100

CORE: NT15-07 P105 Date: 2015/4/22

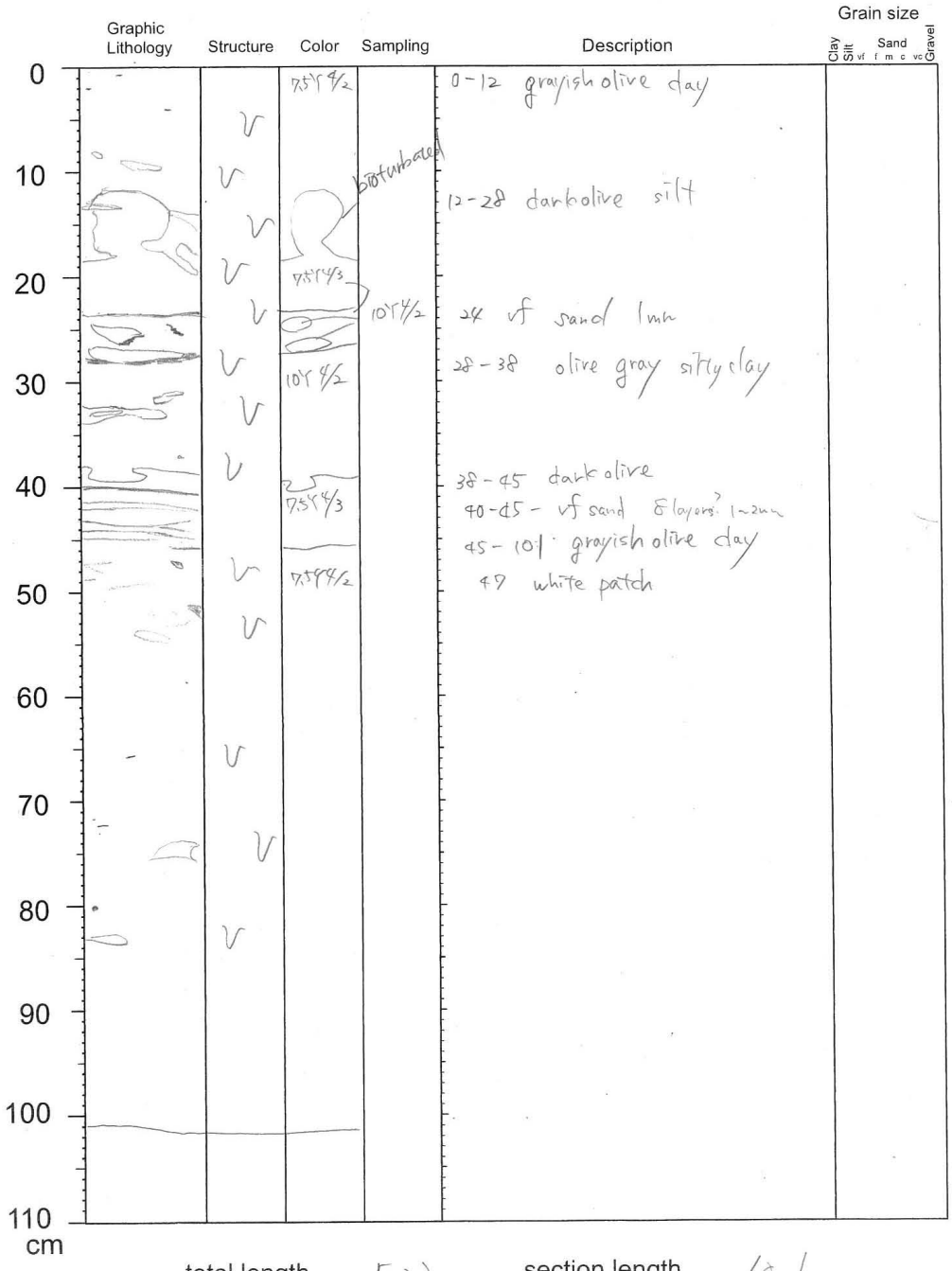
Section: 6 A/ W by: K Arai



total length 421 section length 100

CORE: NT15-07 PC05 Date: 2015/4/23

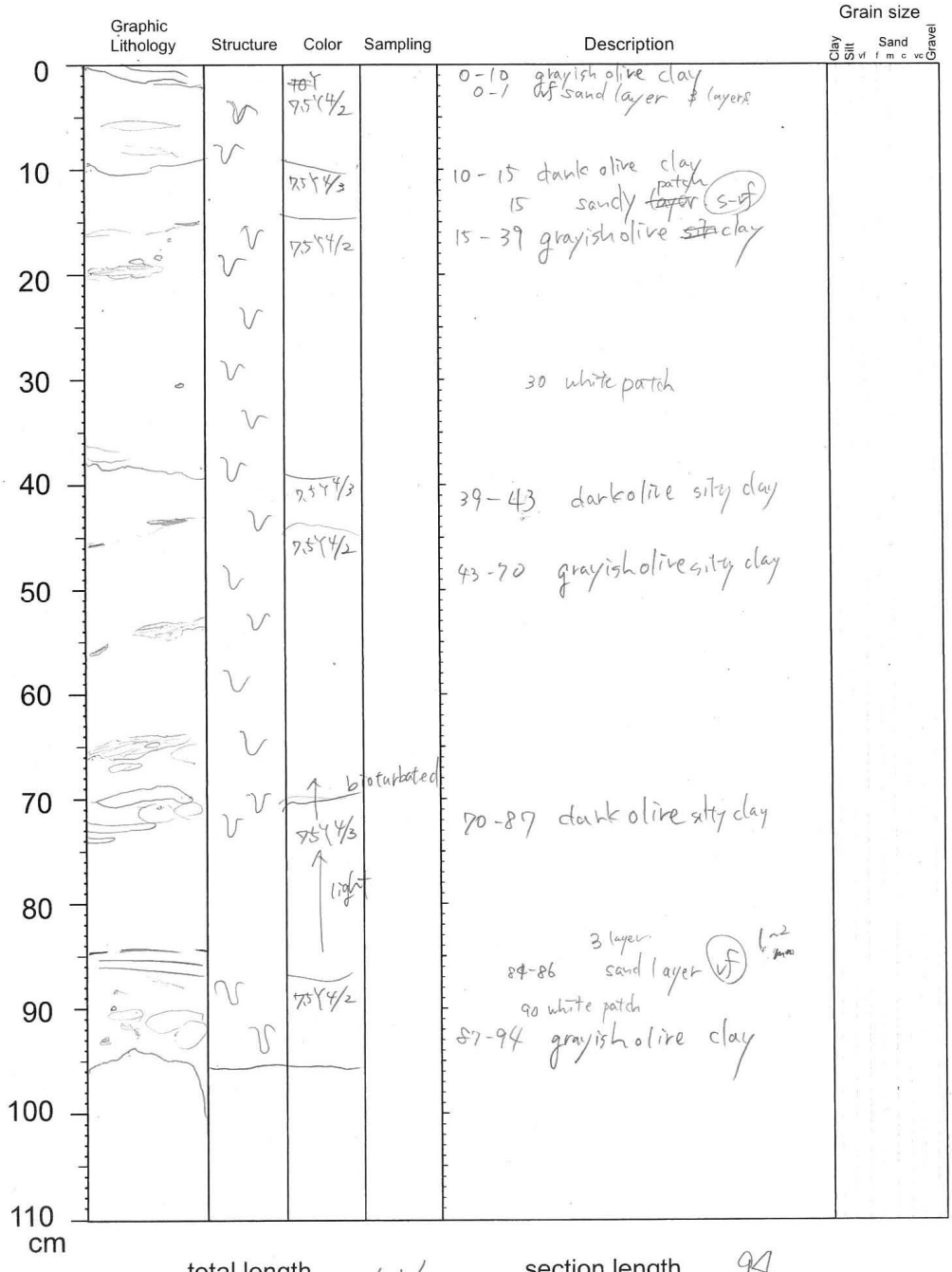
Section: 7 (A)/W by: K. Arai



total length 522 section length 101

CORE: NT15-07 pc05 Date: 2015/4/23

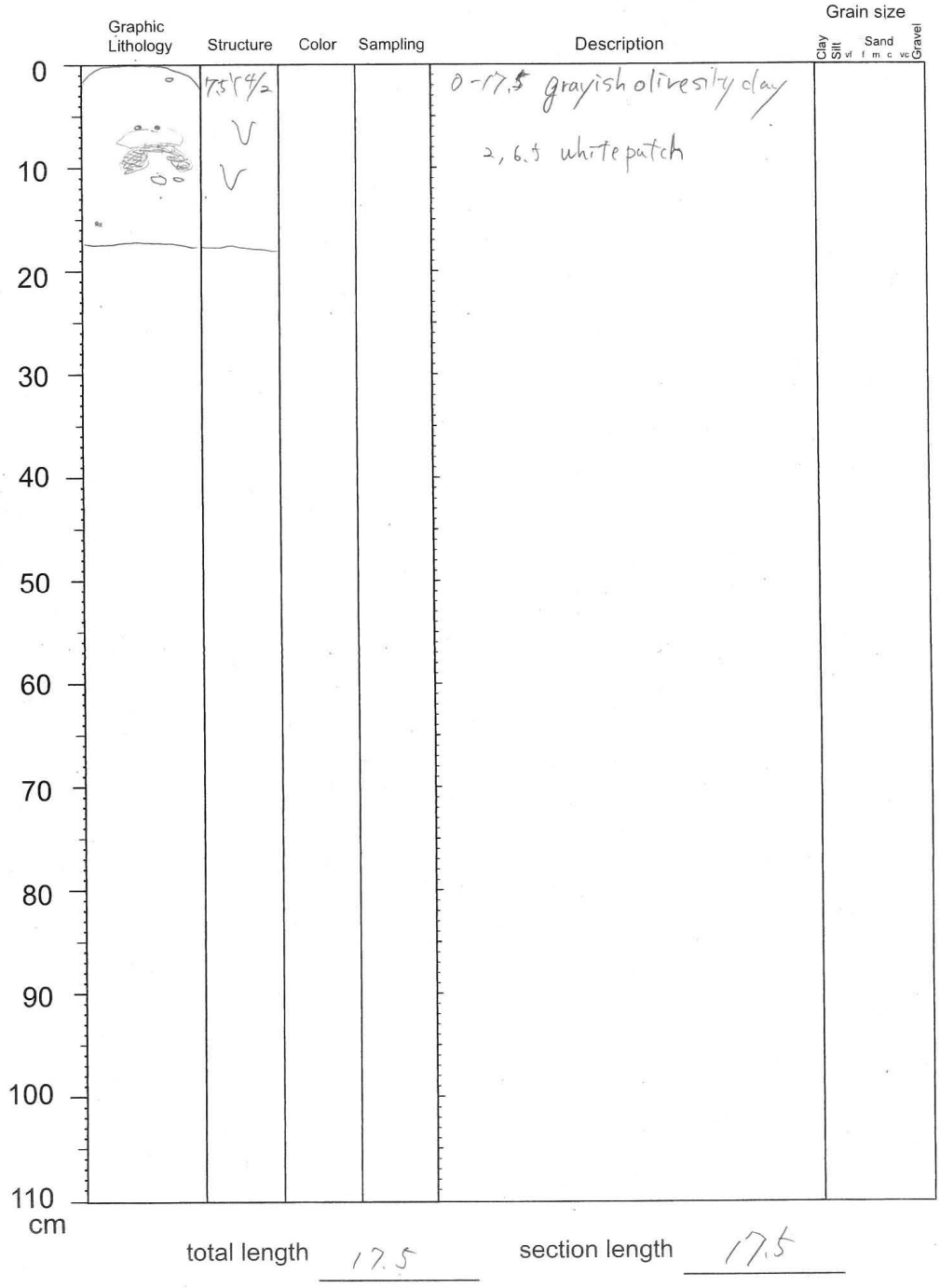
Section: δ A / W by: K. Arai



total length 616 section length 94

CORE: NT15-07 PC05 Date: 2015/4/23

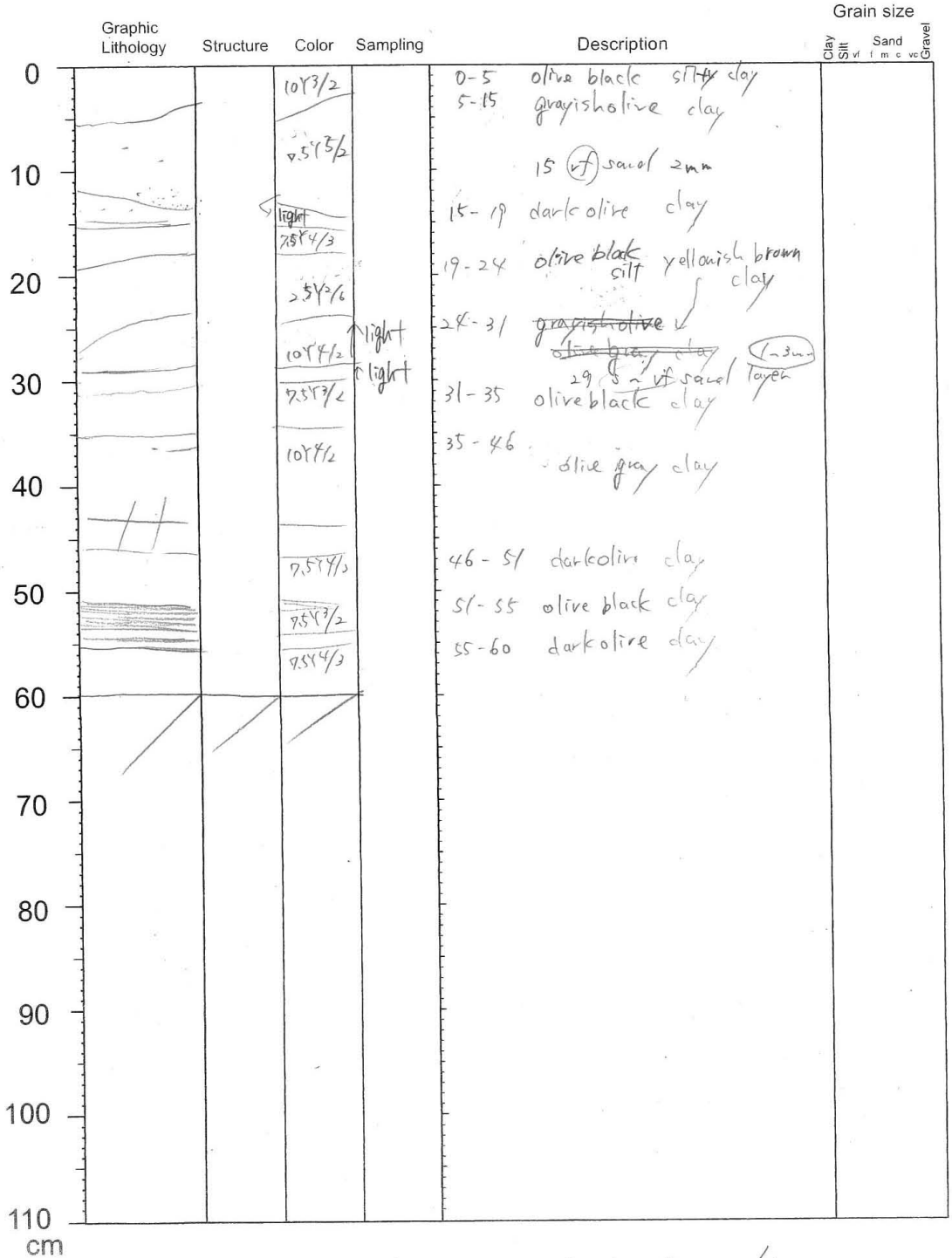
Section: CC (A) W by: K. Arai



total length 17.5 section length 17.5

CORE: NT15-07 PL06 Date: 2015/4/25

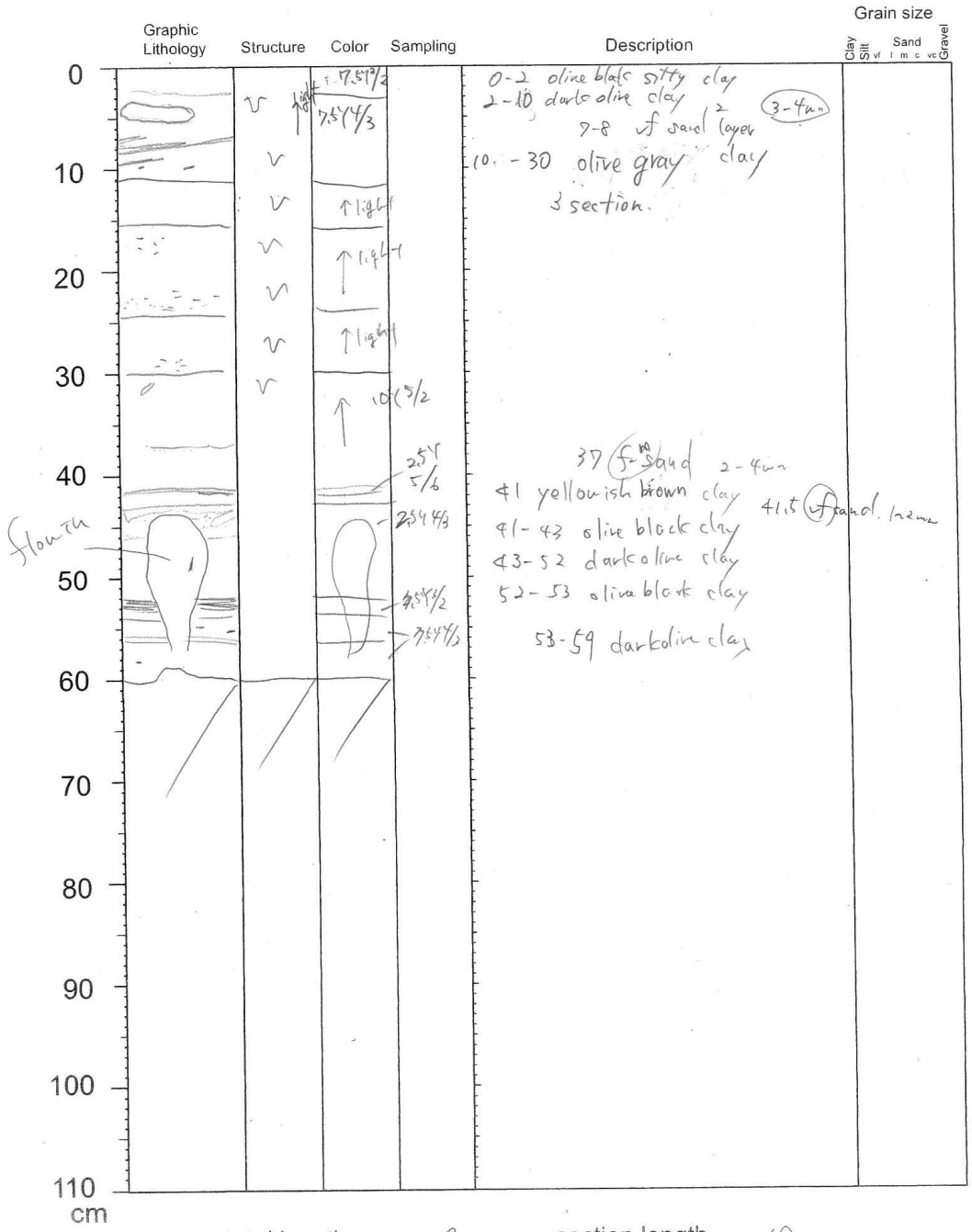
Section: 1 (A)/ W by: K. Arai



total length 60 section length 60

CORE: NT15-07 PL06 Date: 2015/4/25

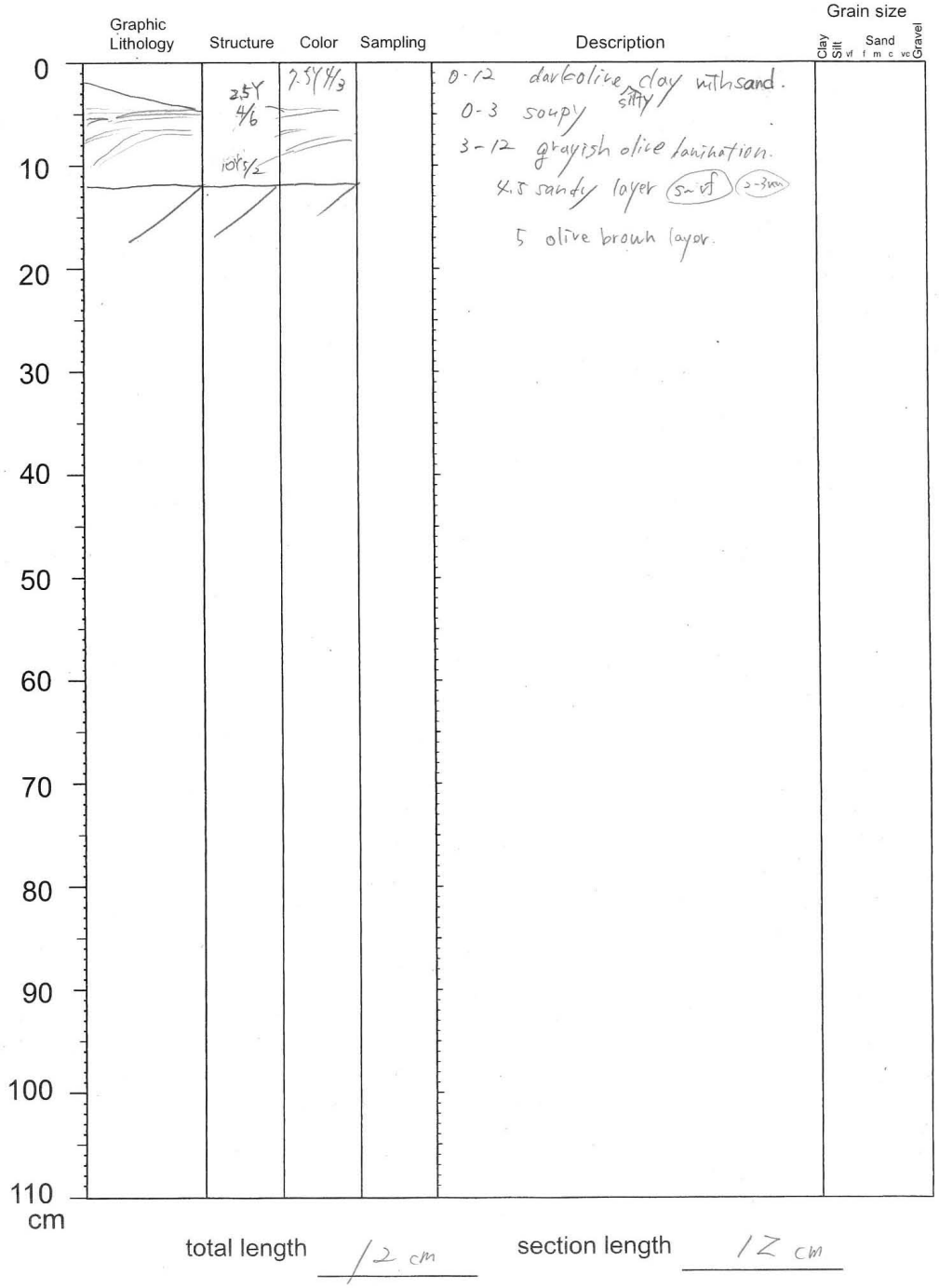
Section: 2 (A) W by: K. Arai



total length 119 section length 39

CORE: NT15-07 PC06 Date: 2015/4/25

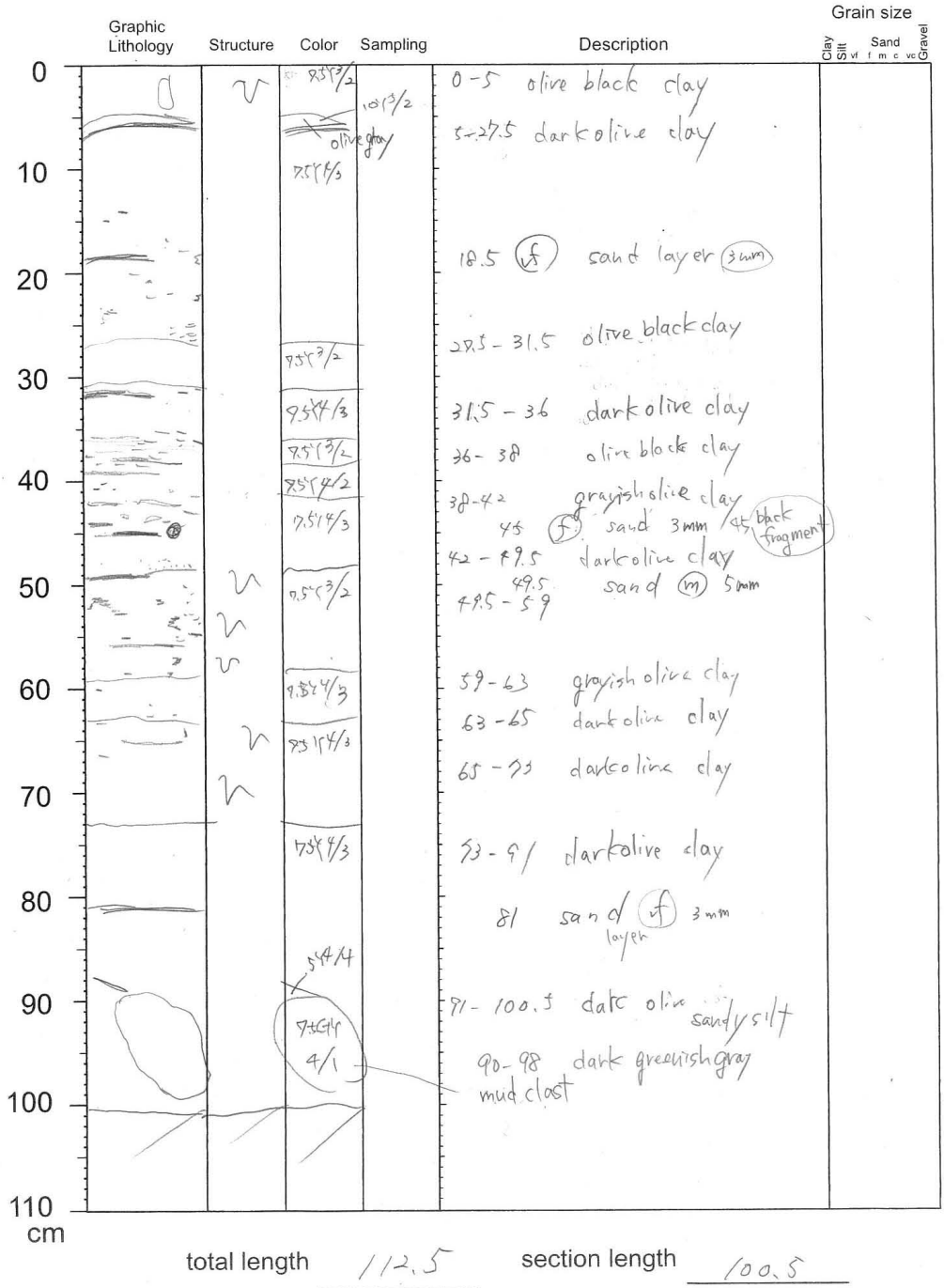
Section: 1 (A)/ W by: K. Arai



total length 12 cm section length 12 cm

CORE: NT15-07 PC06 Date: 2015/4/25

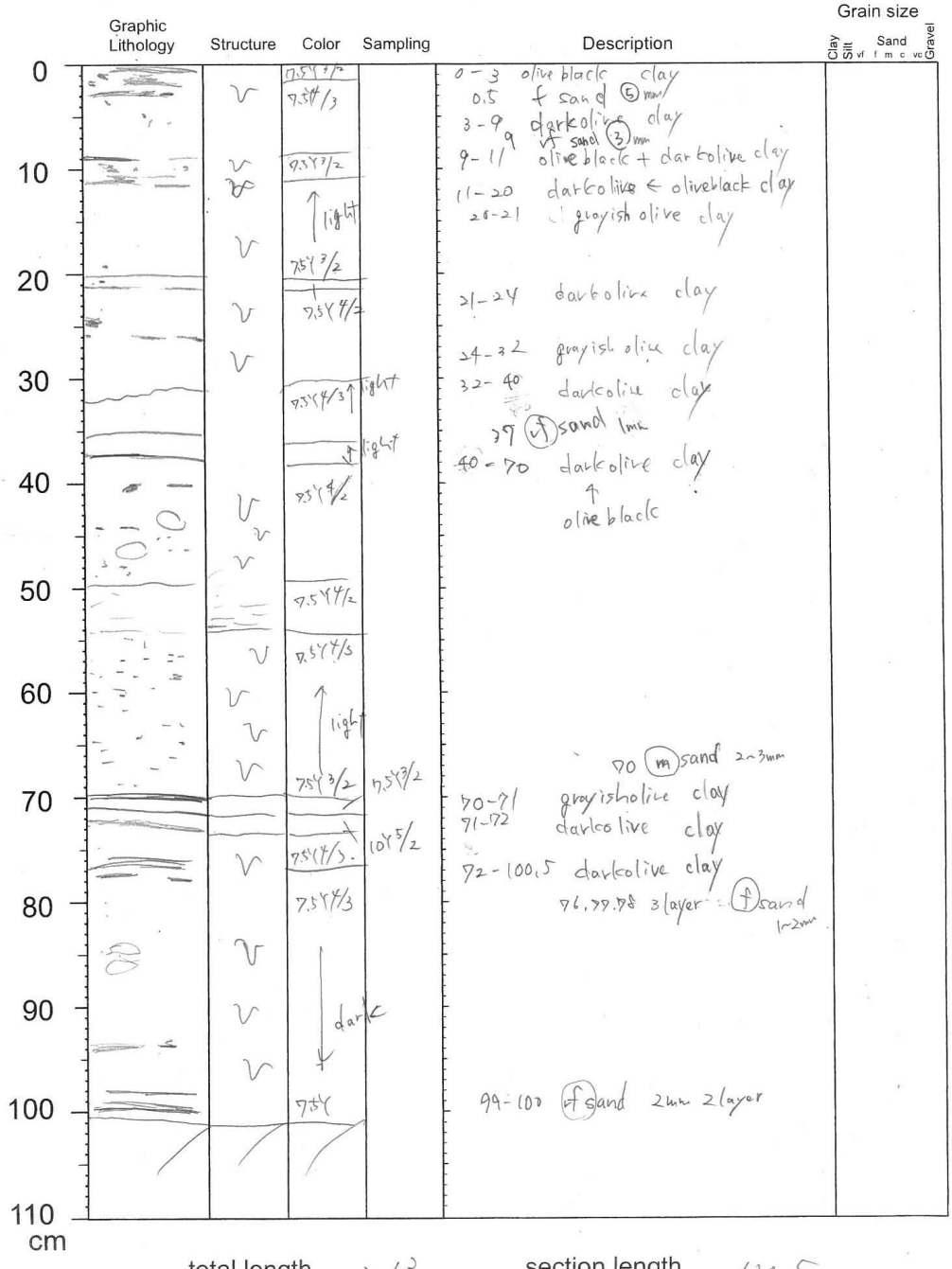
Section: 2 (A) W by: K. Arai



total length 112.5 section length 100.5

CORE: NT15-07 PC06 Date: 2015/9/25

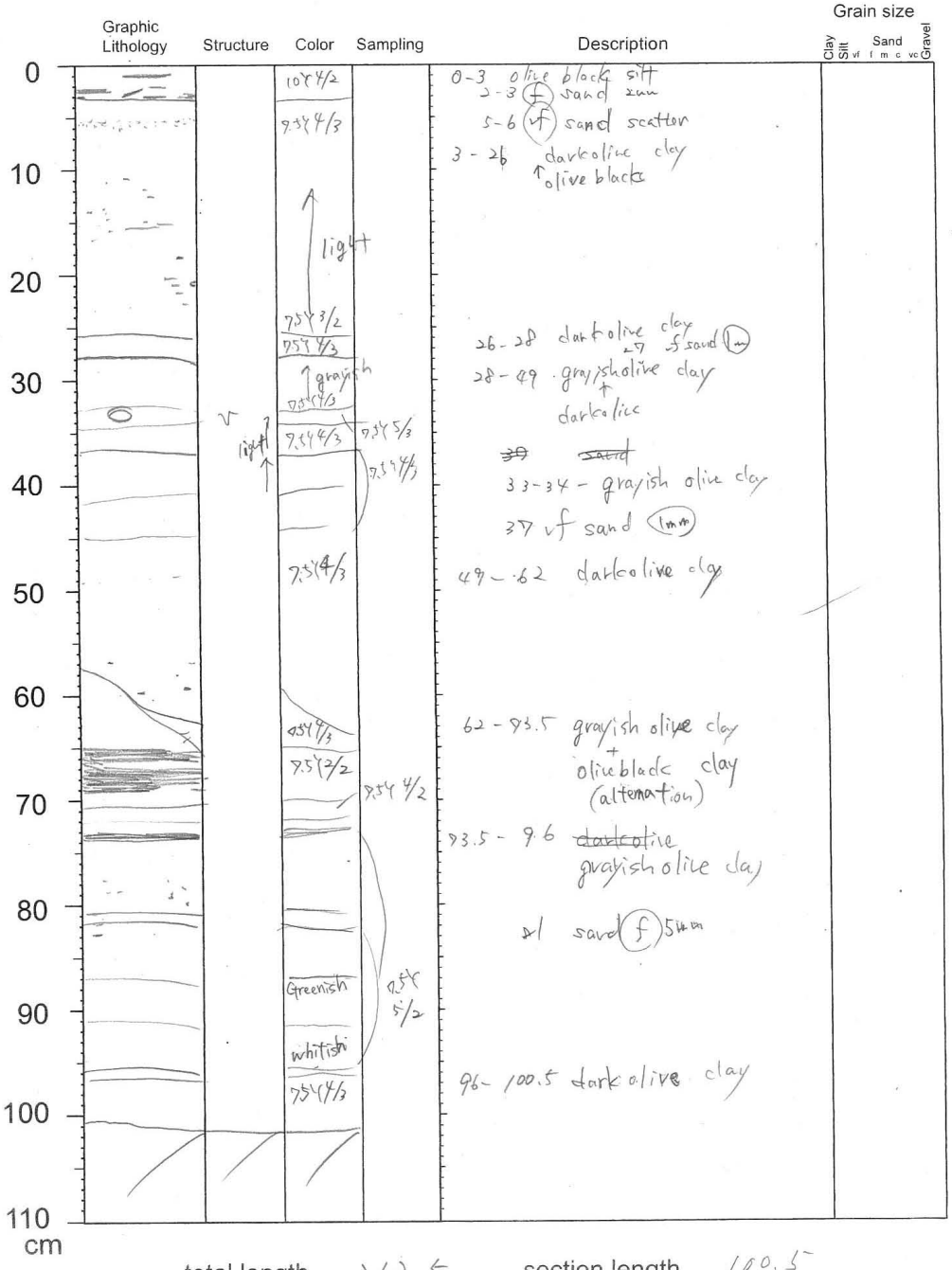
Section: 3 (A) / W by: K. Arai



total length 213 section length 100.5

CORE: NT15-07 PC06 Date: 2015/4/5

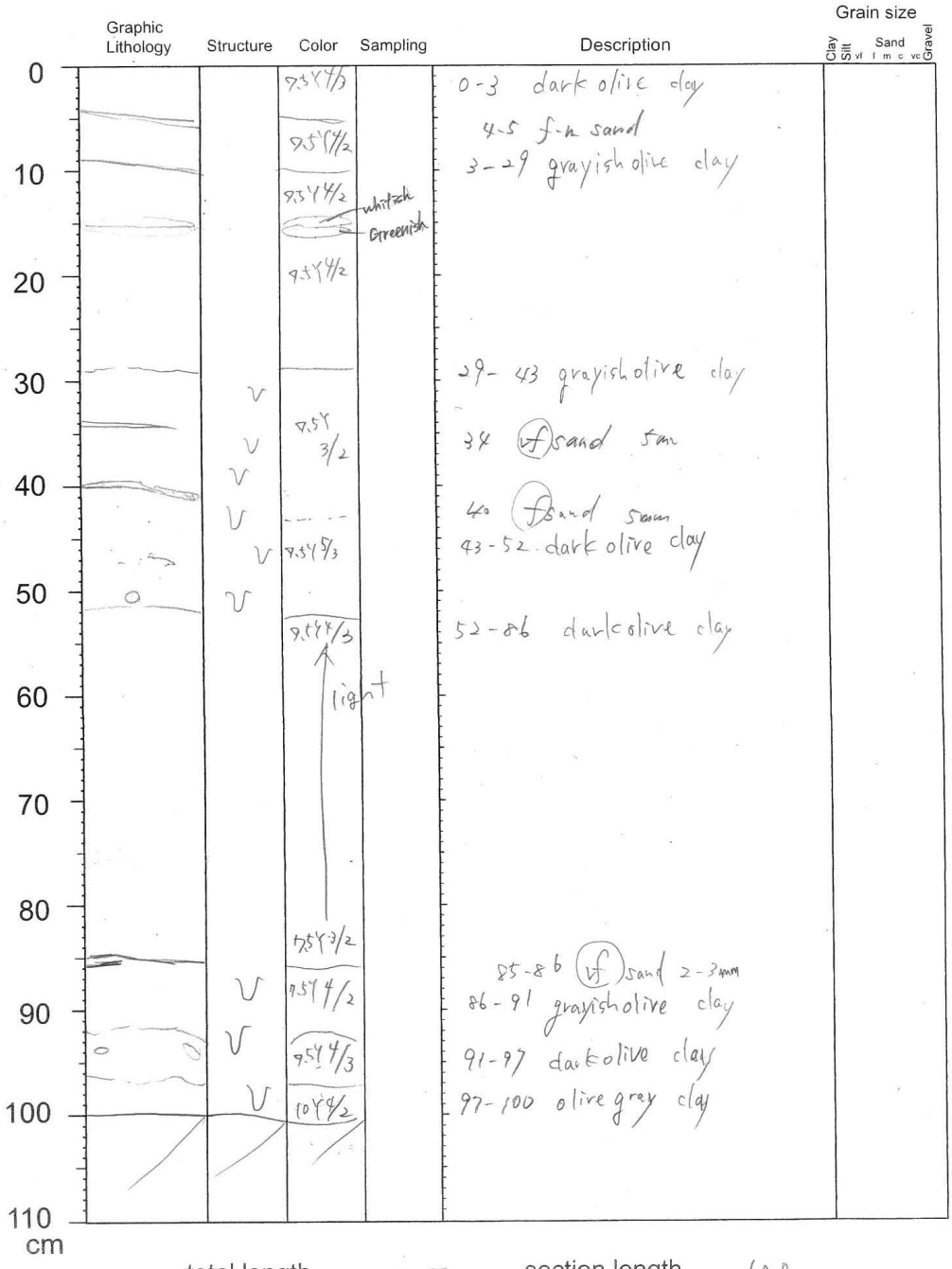
Section: 4 (A)/ W by: K. Arai



total length 113.5 section length 100.5

CORE: NT15-07 Pc06 Date: 2015/4/25

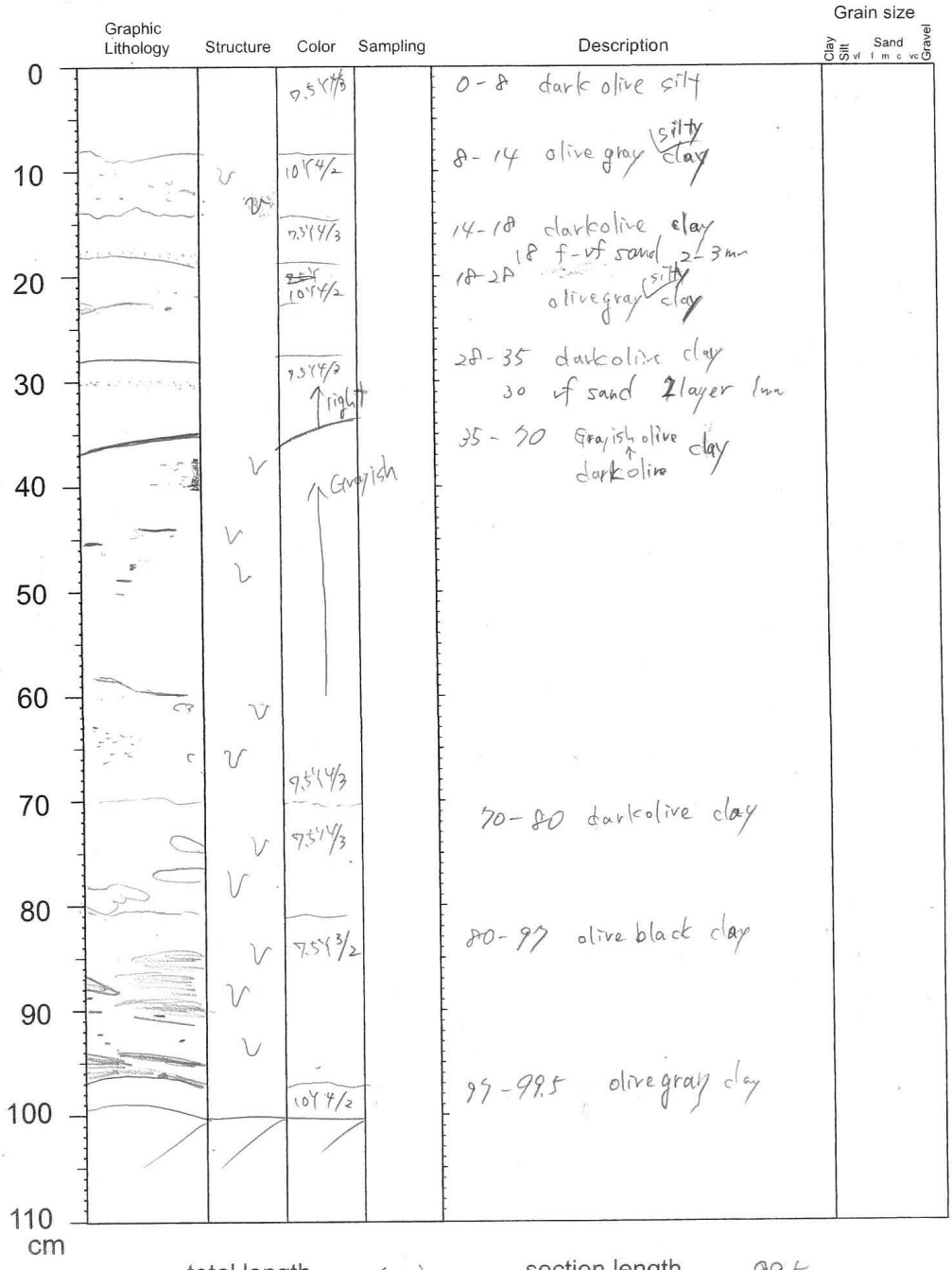
Section: 5 (A)/ W by: K. Arai



total length 143.5 section length 100

CORE: NT15-07 PC06 Date: 2015/4/25

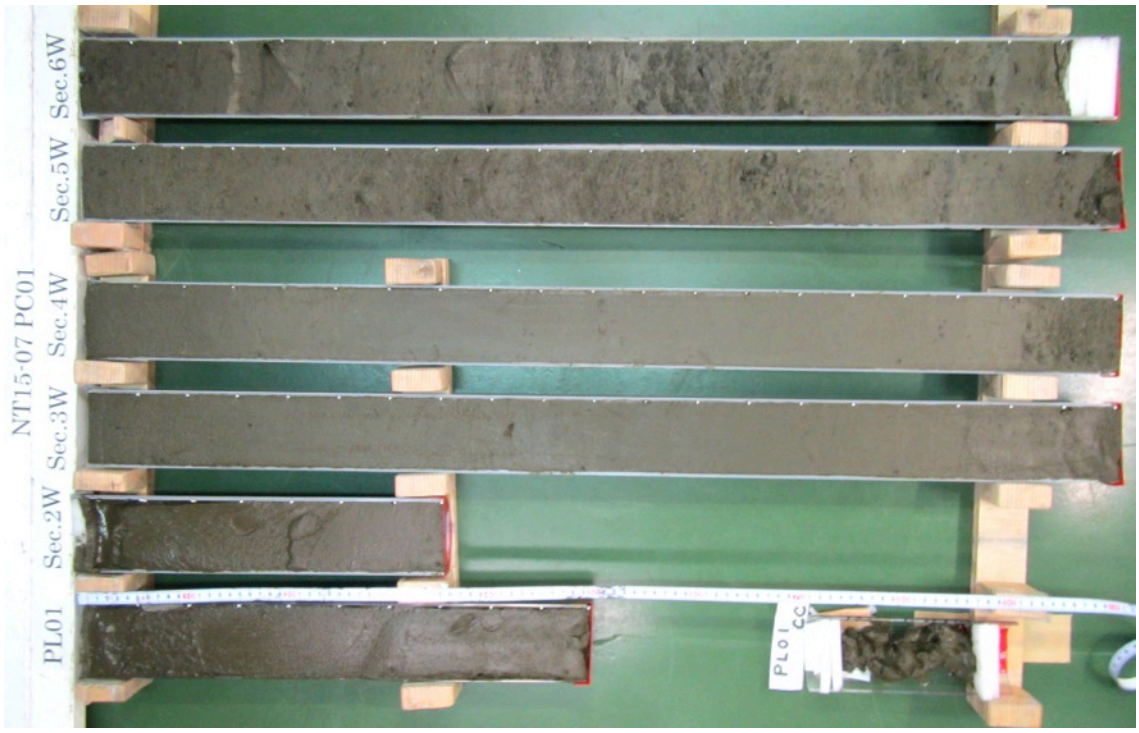
Section: 6 (A)W by: K. Arai



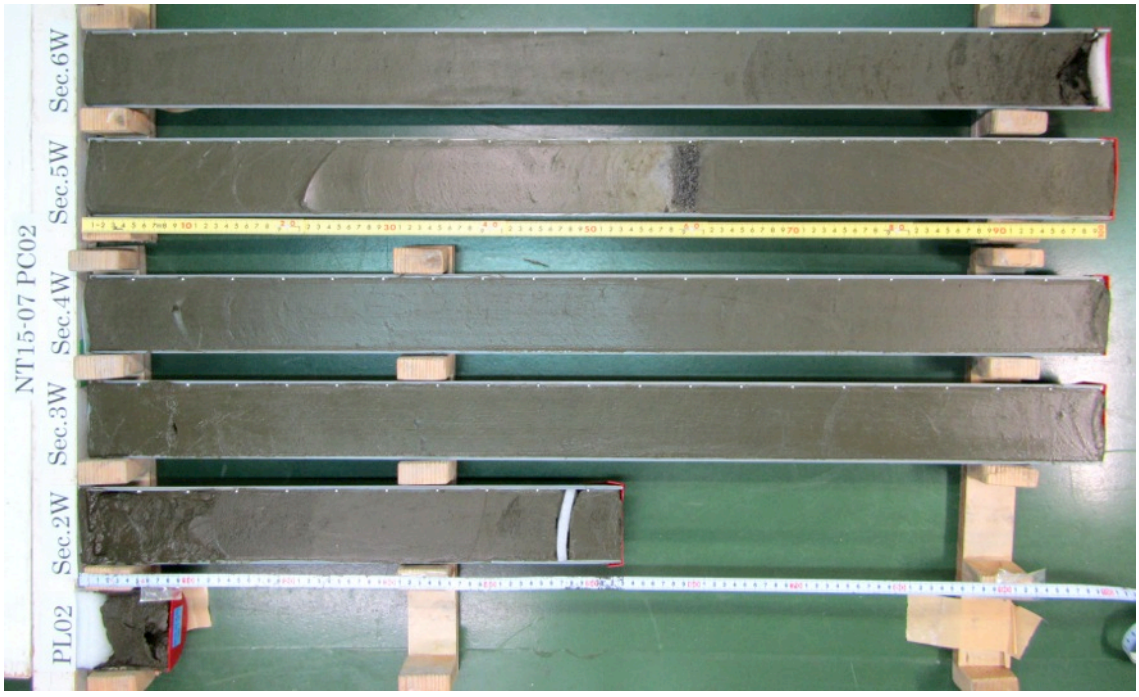
total length 513 section length 99.5

Core Photo

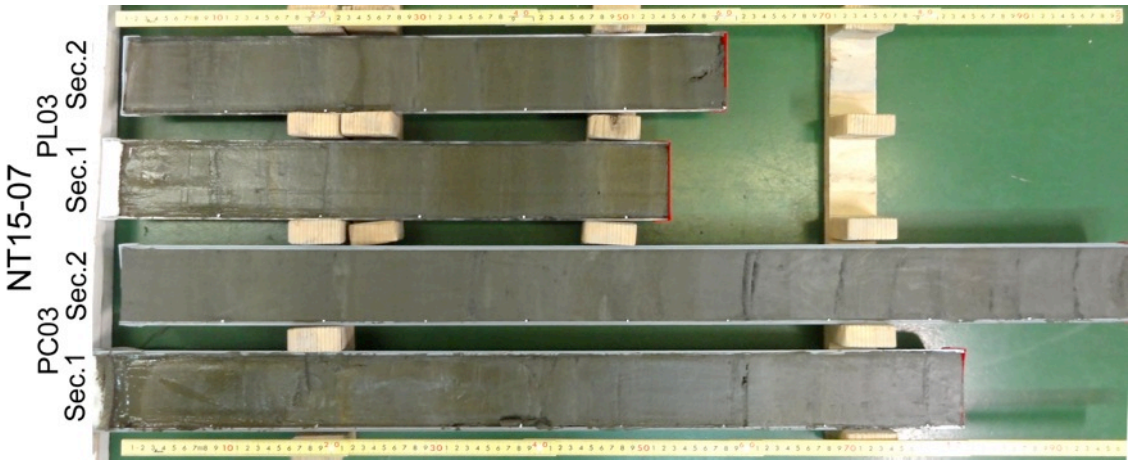
PL01 & PC01



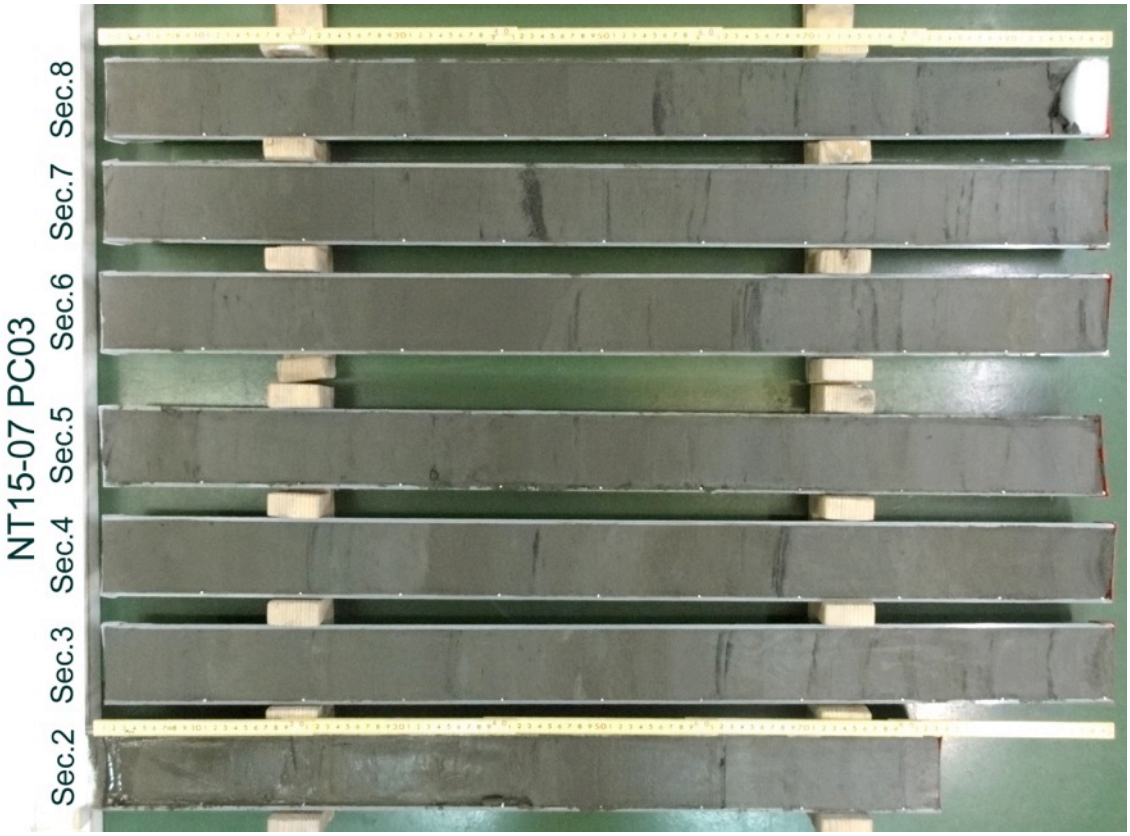
PL02 & PC02



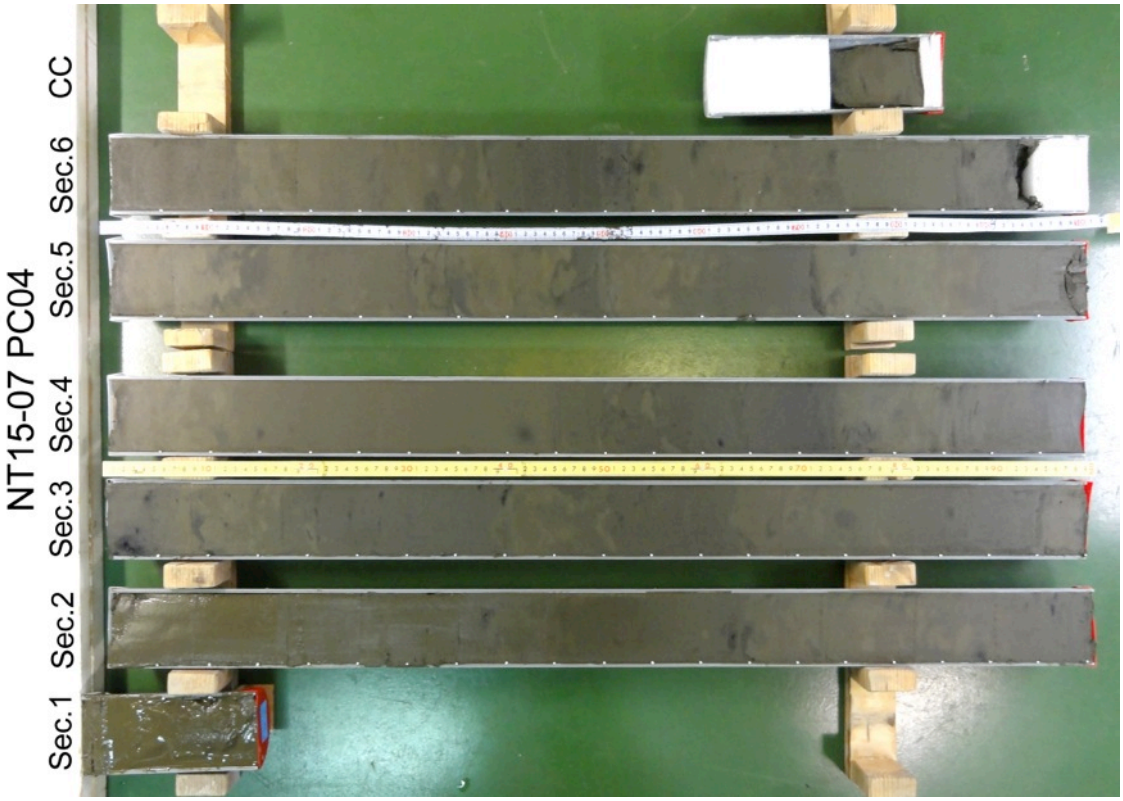
PL03


NT15-07
PC03
Sec.1
Sec.2
PL03
Sec.1
Sec.2

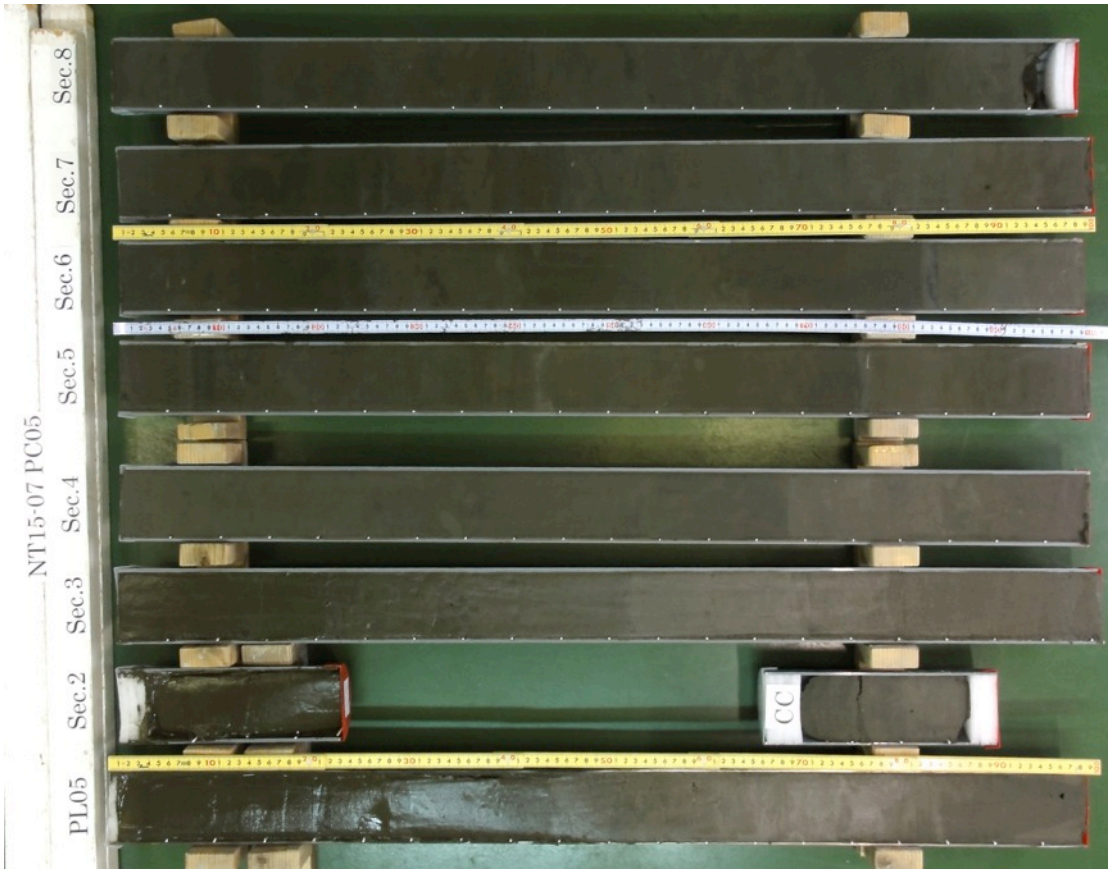
PC03


NT15-07 PC03
Sec.2
Sec.3
Sec.4
Sec.5
Sec.6
Sec.7
Sec.8

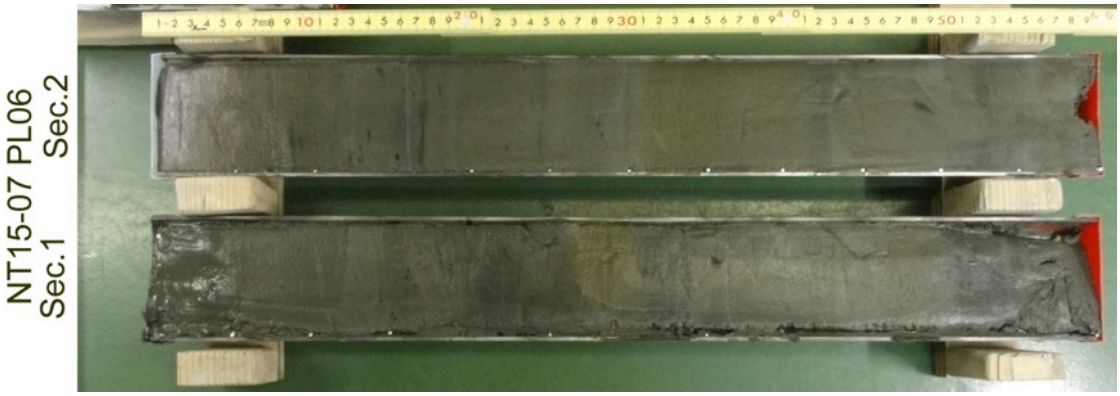
PC04



PL05&PC05



PL06



PC06