

DRAFT CRUISE INSTRUCTIONS

CCGS *Sir Wilfrid Laurier*

Cruise No: LA-01-01

FOCI No: none

Area: Bering Sea and North Pacific Ocean

Itinerary (dates are approximate)

October 5, 2001: Nome, Alaska

October 9, 2001: Dutch Harbor, Alaska (Touch and Go)

October 14, 2001: Dutch Harbor, Alaska

Participating organizations:

NOAA - Pacific Marine Environmental Laboratory (PMEL)

University of Alaska Fairbanks (UAF)

CRUISE DESCRIPTION:

Fisheries-Oceanography Coordinated Investigations (FOCI) is an effort by NOAA and associated academic scientists. At present, FOCI consists of a Shelikof Strait (western Gulf of Alaska) walleye pollock project, and a NOAA Coastal Ocean Program project: Southeast Bering Sea Carrying Capacity. FOCI also supports associated projects, such as the Steller Sea Lion (SSL) Research Initiative, Arctic Research Initiative, U.S. GLOBEC, and NSF Inner Front Study, that address scientific issues related to FOCI's. FOCI's goal is to understand the effects of abiotic and biotic variability on ecosystems of the North Pacific Ocean and Bering Sea in order to discern the physical and biological processes that determine recruitment variability of commercially valuable finfish and shellfish stocks in Alaskan waters.

CRUISE OBJECTIVES:

1. Recover and deploy moorings at the FOCI study areas site #2 and site #4
2. Recover and deploy moorings for the SSL project in the Aleutian Islands study areas
3. Conduct CTD casts at all mooring sites and possibly other stations
4. Deploy six satellite-tracked drifters at designated sites

1.0. PERSONNEL

1.1. Chief Scientist:

William Floering

M

PMEL

206-526-6480

william.floering@noaa.gov

The Chief Scientist has the authority to revise or alter the technical portion of the instructions as work progresses provided that, after consultation with the Commanding Officer, it is ascertained that the proposed changes will not: (1) jeopardize the safety of personnel or the ship; (2) exceed the overall time allotted for the project; (3) result in undue additional expenses; (4) alter the general intent of these project instructions.

1.2. Participating Scientists

Carol DeWitt	F	PMEL	USA
William Floering	M	PMEL	USA
Susan Henrichs	F	UAF	USA
Dave Kachel	M	PMEL	USA
PMEL Engineer	M	PMEL	USA
Sarah Thornton	F	UAF	CANADIAN
Dave Wisegarver	M	PMEL	USA

NOTE: Susan Henrichs and Sara Thornton will depart the ship on the first Dutch Harbor touch and go.

1.3. NOAA / PMEL Operations Contact:

Carrie Hadden
NOAA/PMEL (R/PM)
7600 Sand Point Way NE
Seattle, WA 98115-6349
(206) 526-4485
Carrie.Hadden@noaa.gov

1.4. Program Contacts:

Dr. Phyllis Stabeno
PMEL
7600 Sand Point Way NE
Seattle, WA 98115-6349
(206) 526-6453
stabeno@pmel.noaa.gov

Dr. Jeff Napp
AFSC
7600 Sand Point Way NE
Seattle, WA 98115-6349
(206) 526-4148
jeff.napp@noaa.gov

1.5 Canadian Coast Guard Contacts:

Dr. Eddy Carmack
Research Scientist
Pacific Region
Institute of Ocean Sciences
9860 West Saanich Road
Sidney, BC Canada V8L 4B2
250-363-6585
CarmackE@pac.dfo-mpo.gc.ca

Chief Scientist:
Bon van Hardenberg
vanHardenbergB@pac.dfo-mpo.gc.ca
250-363-6373

2.0. OPERATIONS

A standard physical oceanographic watch will be utilized that consists of a winch operator, a scientist and a Survey Tech (or equivalent) on deck. A nutrient/chlorophyll scientist will participate as necessary. Mooring scientists and deck department personnel will be required for all mooring operations. Operations will occur 24 hours per day.

2.1. SUMMARY OF ACTIVITIES:

Operations during Cruise LA-01-01 will consist of mooring recoveries, mooring deployments, CTD casts, water sample collections, drifter deployments and CalVET plankton tows.

CTD casts optimally are performed before each mooring recovery and after each mooring deployment. For expediency, a single cast may be made in lieu of two at the discretion of the Chief Scientist. The Chief Scientist may order additional CTDs. Water samples shall be taken as possible to insure accuracy of sensors and to measure nutrient levels.

Mooring Operations (see Appendices):

Site # 4	Recover one mooring; deploy one mooring
Site # 2	Recover four moorings; deploy three moorings
Akutan Pass	Recover and deploy two moorings
Amukta Pass	Recover and deploy four moorings
Seguam Pass	Recover and deploy two moorings

The Chief Scientist may adjust the schedule to provide daylight for recovery operations. In the event that conditions prohibit mooring deployments/recoveries, operations will focus on CTD lines to be selected by the Chief Scientist.

2.2. PROCEDURES FOR OPERATIONS: The following are operations to be conducted on this cruise. Details and times of operations are appended to these instructions. The Chief Scientist will provide to ship's personnel before the start of the cruise, any modifications to the operations, locations, or mooring diagrams contained in these instructions. The expected order of operations is:

- Mooring calibration CTDs will be completed while on site of each mooring recovery/deployment.
- At site #4, one subsurface mooring will be recovered and deployed, and CTDs will be conducted at the mooring location.
- On the way from site #4 to site #2, four CTDs may be conducted with water samples collected for nutrients and chlorophyll at four locations around site #2.
- Upon completion of site #2 operations, the ship will proceed to Dutch Harbor for a touch and go to load equipment needed for the remainder of the cruise, to drop off two scientists and pick up one more.
- At Akutan Pass, two subsurface moorings will be recovered and deployed. If operations are running ahead of schedule by several hours, then following Akutan Pass operations, the ship will steam southwest for about four hours, and then deploy three satellite-tracked drifters. Four ADCP subsurface moorings will be recovered and deployed at Amukta Pass. Three satellite-tracked drifters will be deployed along the Amukta Pass mooring line during CTD operations.
- After Amukta Pass operations, Canadian scientists will service a mooring for several hours.
- The last NOAA moorings will be at Seguam Pass where two subsurface moorings will be recovered and deployed.

This will complete the planned operations for LA-01-01.

For descriptions of operations see the following paragraphs from the PMEL/FOCI Standard Operating instructions:

CTD/Water samples (SOI 2.2.1)

We will be using the ship's Sea Bird CTD system for CTD operations. The CTD should descend at a rate of 15 to 30 m/min for the first 200 m and 40 m/min below that. The ascent rate should be 50 m/min. One exception to the descent rate occurs on the Bering Shelf in water less than 150 m deep. In this case, the CTD should descend at 30 m/min during the entire cast. We request that the bridge staff maintain a log of all operations to include, time, lat., long, depth and weather information.

CTD Calibration: Salinity samples will be taken on every cast (or as specified by the Chief Scientist). No reversing thermometers will be required. If an AutoSal or other equivalent equipment is available, we will process our salinity samples on board.

Satellite-tracked drifter buoy (SOI 2.2.11)

Two to three working days before deployment, the Chief Scientist or designated person will secure the drifter on the back deck, turn it on (usually by removing the magnet), and send an e-mail message to Dr. Phyllis Stabeno (stabeno@ pmel.noaa.gov) stating the serial number that is stamped on the drifter and the time that it was turned on. The method of deployment of the drifter is dependent upon the particular make of drifter and is to be directed by the Chief Scientist or designated person.

3.0. FACILITIES AND EQUIPMENT

The following systems and their associated support services are essential to the cruise. Sufficient consumable, back-up units, and on-site spares and technical support must be in place to assure that operational interruptions are minimal. All measurement instruments are expected to have current calibrations, and all pertinent calibration information shall be included in the data package.

3.1. Equipment and Capabilities to be Provided by the Ship

- Capstan or winch system for recovery and deployment of moorings
- Oceanographic winch and CTD
- EK-500 or suitable water depth indication to 1500 meters
- Wire speed indicators for CTD winch
- Meteorological observations each hour and for each operation
- Laboratory space, sink, lab tables and storage space
- Adequate deck lighting for night-time operations
- Navigational equipment including GPS and radar
- Safety harnesses for working on quarter deck and fantail

3.2. Equipment to be Provided by the Project

- Subsurface moorings
- Miscellaneous scientific sampling and processing equipment
- Cruise Operations Database (COD) software and forms

4.0. MISCELLANEOUS

INVENTORY:

NOAA nutrient chemicals on board *Sir Wilfrid Laurier*

Mercuric chloride 0.9 grams (Henricks)
Sulfamic acid 500 grams (Henricks)
Hydrochloric Acid (1 liter) (Wisegarver and Thorton)
N-1-Naphthylethylenediamine Dihydrochloride (Wisegarver and Thorton) 3 grams
Potassium Nitrate (2 x 3.5g, 7g total) (Wisegarver and Thorton)
Sulfanilamide (14 x 10g, 140g) (Wisegarver and Thorton)
Sodium Nitrite (Wisegarver and Thorton) 15 grams

5.0. COMMUNICATIONS

5.1. Important phone numbers, fax numbers and e-mail addresses:

PMEL/Director: (206) 526-6800
PMEL/CARD Fax: (206) 526-6485
PMEL/ADMIN Fax: (206) 526-6815
PMEL person: LastName@pmel.noaa.gov OR FirstName.LastName@noaa.gov

CCGS Sir Wilfrid Laurier
Attn: (person's name)
C/O Victoria Base
25 Huron Street
Victoria, BC V8V 4V9
laurier@pac.dfo-mpo.gc.ca
To contact *Sir Wilfrid Laurier* at sea, call the Regional Operations Centre at 250-413-2800.

6.0. APPENDICES

6.1. Figure 1 and Table 1 with probable order and summary of operations (A through H).

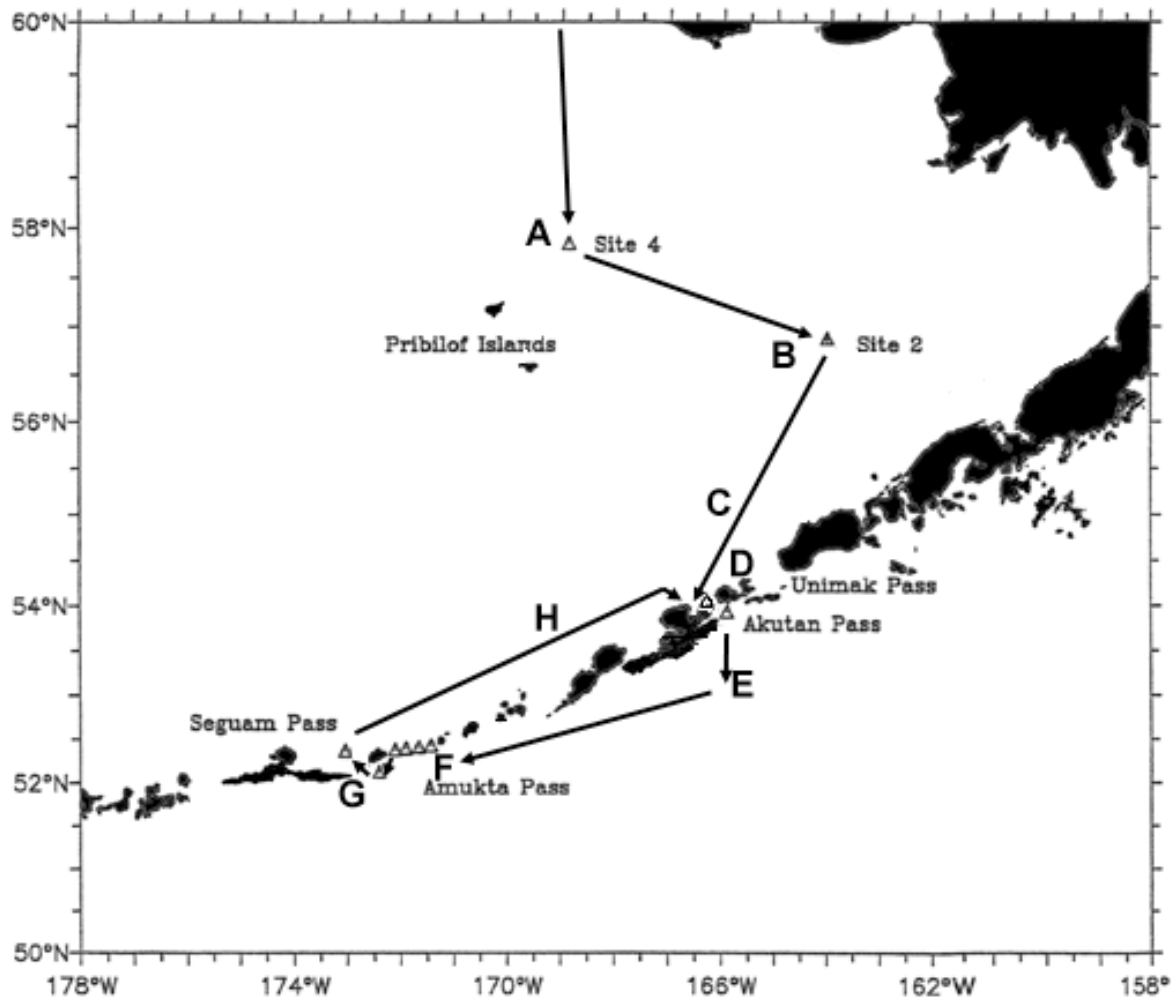


Fig. 1. Probable order of operations during LA-01-01.

Table 1. Operations summary

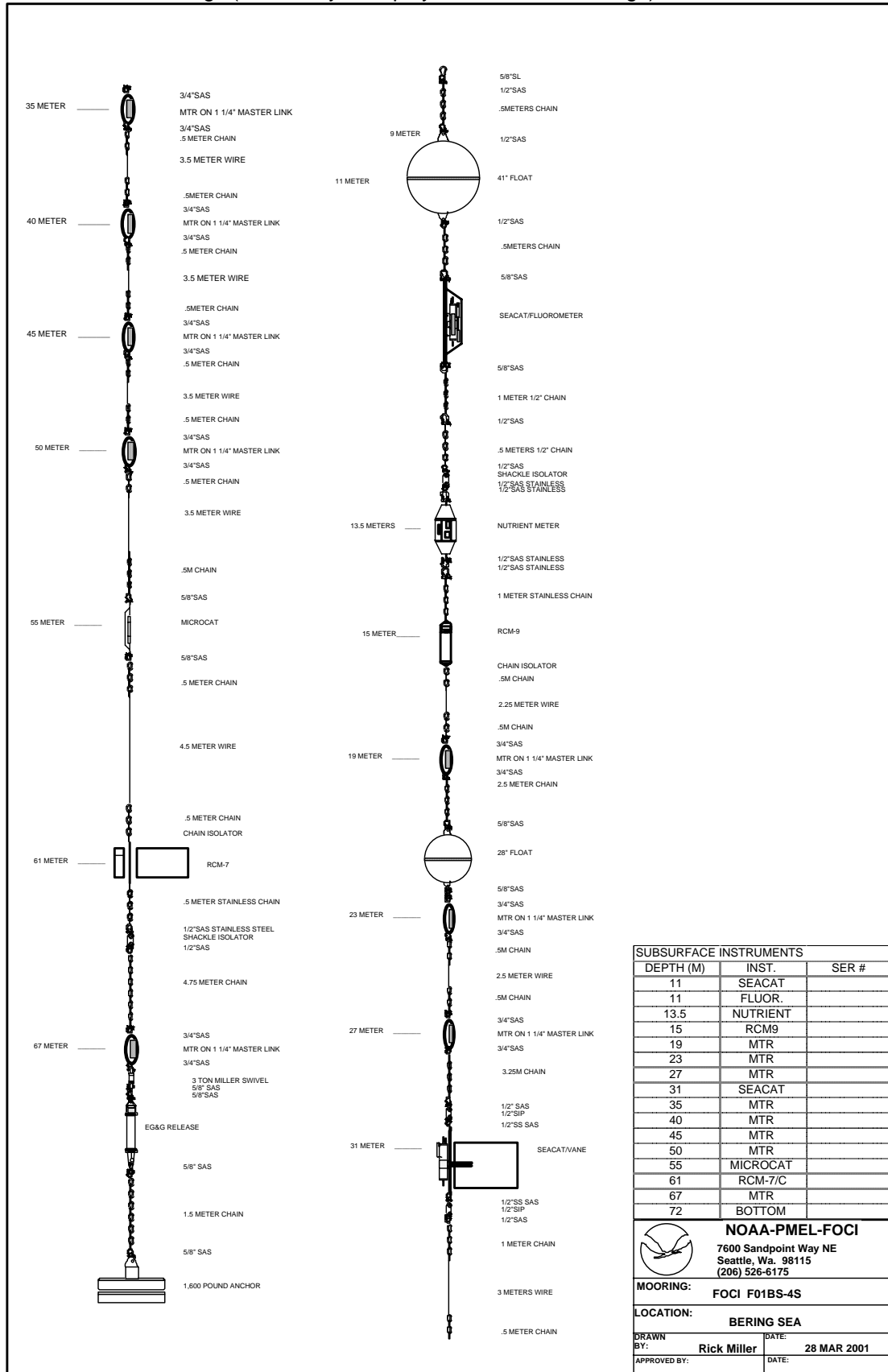
Segment	Recoveries	Deployments	CTDs	Drifters
A	1	1	1	0
B	4	3	6	0
C	no operations			
D	2	2	2	0
E	0	0	0	3
F	4	4	4	3
G	2	2	2	0
H	no operations			

6.2. Table 2 with projected cruise schedule, mooring locations.

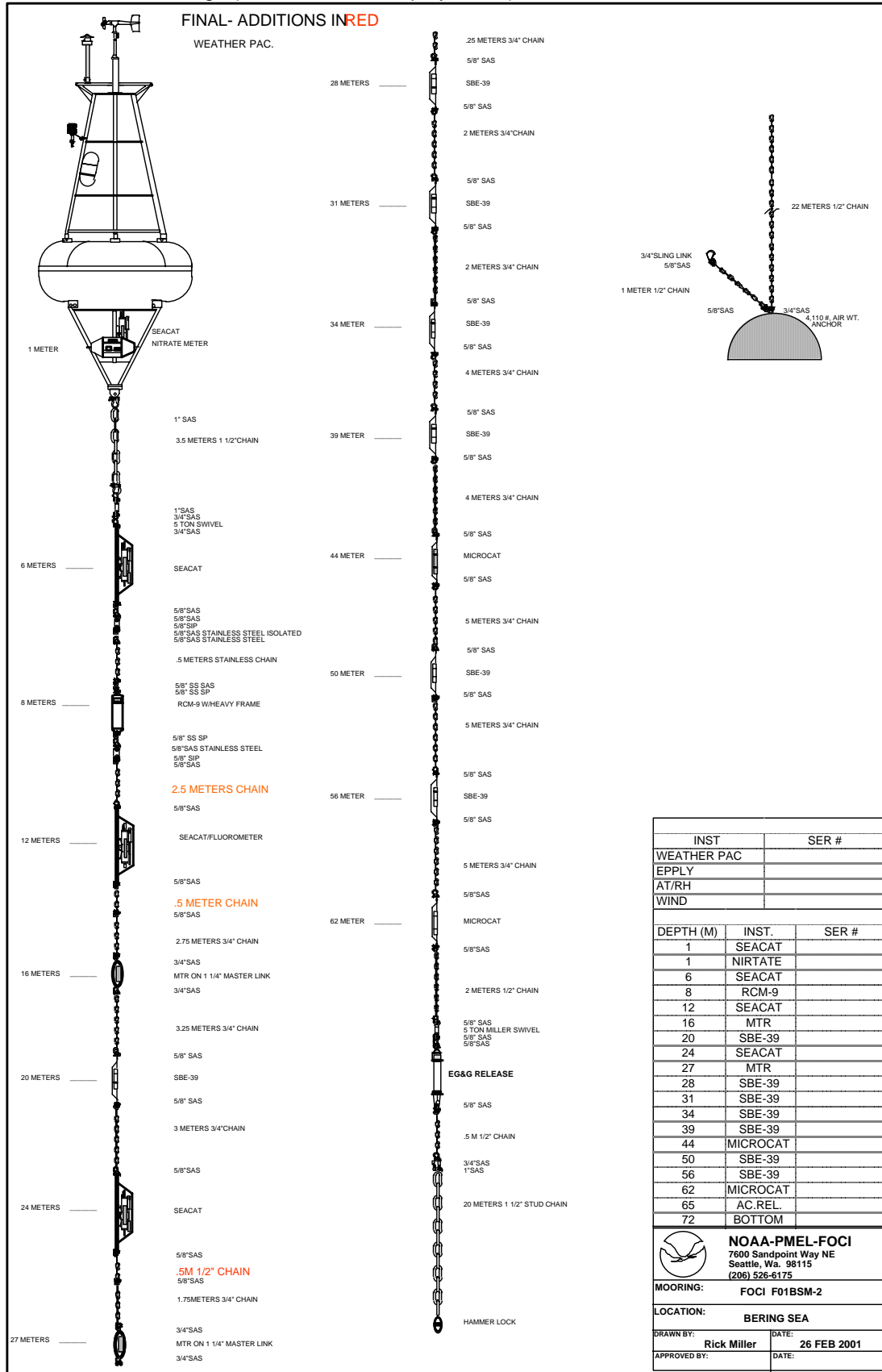
Activity	North Latitude (deg min)		N	West Longitude (deg min)		W	Distance (nm)	Ship's Speed (kts)	Hours to Station	Hours on Station	Arrival Time (ADT)	Departure Time (ADT)
Depart Nome	64	30.3	N	165	20.5	W						05-Oct-01 15:00
Recover/CTD BS-4	57	51.0	N	168	52.0	W	412.0	10.0	41.2	1.8	07-Oct-01 08:11	07-Oct-01 10:00
Deploy BS-4	57	51.0	N	168	52.0	W	0.0	10.0	0.0	1.5	07-Oct-01 10:00	07-Oct-01 11:30
CTD M2-west	56	46.0	N	164	20.0	W	160.6	10.0	16.1	0.3	08-Oct-01 03:34	08-Oct-01 03:53
CTD M2-north	57	01.0	N	164	13.0	W	15.5	10.0	1.5	0.3	08-Oct-01 05:26	08-Oct-01 05:44
CTD M2-east	56	56.5	N	163	50.0	W	13.3	10.0	1.3	0.3	08-Oct-01 07:04	08-Oct-01 07:23
CTD M2-south	56	40.0	N	163	52.0	W	16.5	10.0	1.7	0.3	08-Oct-01 09:02	08-Oct-01 09:21
CTD/recover sfc BS-2	56	52.9	N	164	03.5	W	14.4	10.0	1.4	2.8	08-Oct-01 10:47	08-Oct-01 13:36
Recover ADCP BS-2	56	52.9	N	164	03.5	W	0.0	10.0	0.0	1.0	08-Oct-01 13:36	08-Oct-01 14:36
Recover sed trap 1 BS-2	56	52.9	N	164	03.5	W	0.0	10.0	0.0	1.0	08-Oct-01 14:36	08-Oct-01 15:36
Recover sed trap 2 BS-2	56	52.9	N	164	03.5	W	0.0	10.0	0.0	1.0	08-Oct-01 15:36	08-Oct-01 16:36
Deploy ADCP BS-2	56	52.9	N	164	03.5	W	0.0	10.0	0.0	1.0	08-Oct-01 16:36	08-Oct-01 17:36
Deploy sed trap BS-2	56	52.9	N	164	03.5	W	0.0	10.0	0.0	1.0	08-Oct-01 17:36	08-Oct-01 18:36
Deploy subsfc/CTD BS-2	56	52.9	N	164	03.5	W	0.0	10.0	0.0	1.8	08-Oct-01 18:36	08-Oct-01 20:25
Dutch Harbor touch and go	53	54.5	N	166	30.9	W	198.0	10.0	20.0	18.0	09-Oct-01 16:25	10-Oct-01 10:25
Recover/CTD AKP-1	54	04.0	N	166	18.0	W	12.2	10.0	1.2	0.8	10-Oct-01 11:38	10-Oct-01 12:27
Deploy AKP-1	54	04.0	N	166	18.0	W	0.0	10.0	0.0	1.0	10-Oct-01 12:27	10-Oct-01 13:27
Recover/CTD AKP-2	53	56.0	N	165	55.0	W	15.7	10.0	1.6	0.8	10-Oct-01 15:01	10-Oct-01 15:50
Deploy AKP-2	53	56.0	N	165	55.0	W	0.0	10.0	0.0	1.0	10-Oct-01 15:50	10-Oct-01 16:50
Deploy drifter	53	18.0	N	166	37.9	W	45.7	10.0	3.8	0.2	10-Oct-01 20:39	10-Oct-01 20:49
Deploy drifter	53	02.5	N	166	46.8	W	16.4	10.0	1.4	0.2	10-Oct-01 22:10	10-Oct-01 22:20
Deploy drifter	52	57.8	N	166	52.0	W	5.6	10.0	0.6	0.2	10-Oct-01 22:54	10-Oct-01 23:04
Recover AMP-1	52	26.0	N	171	27.0	W	169.6	10.0	17.0	0.8	11-Oct-01 16:02	11-Oct-01 16:52
Recover AMP-2	52	25.0	N	171	40.0	W	8.0	10.0	0.8	0.8	11-Oct-01 17:40	11-Oct-01 18:30
Recover AMP-3	52	24.0	N	171	55.0	W	9.2	10.0	0.9	0.8	11-Oct-01 19:25	11-Oct-01 20:15
Recover/CTD AMP-4	52	23.0	N	172	07.0	W	7.4	10.0	0.7	1.3	11-Oct-01 20:59	11-Oct-01 22:17
Deploy drifter	52	23.5	N	172	01.0	W	3.7	10.0	0.4	0.1	11-Oct-01 22:39	11-Oct-01 22:44
CTD/deploy AMP-3	52	24.0	N	171	55.0	W	3.7	10.0	0.4	1.3	11-Oct-01 23:07	12-Oct-01 00:24
CTD/deploy/drifter AMP-2	52	25.0	N	171	40.0	W	9.2	10.0	0.9	1.4	12-Oct-01 01:19	12-Oct-01 02:42
CTD/deploy/drifter AMP-1	52	26.0	N	171	27.0	W	8.0	10.0	0.7	4.4	12-Oct-01 03:24	12-Oct-01 07:47
Recover/CTD SMP-2	52	08.0	N	172	25.0	W	39.8	10.0	4.0	1.2	12-Oct-01 11:46	12-Oct-01 12:56
Deploy SMP-2	52	08.0	N	172	25.0	W	0.0	10.0	0.0	0.7	12-Oct-01 12:56	12-Oct-01 13:36
Recover/CTD SMP-1	52	16.0	N	172	45.0	W	14.6	10.0	1.5	1.2	12-Oct-01 15:04	12-Oct-01 16:18
Deploy SMP-1	52	16.0	N	172	45.0	W	0.0	10.0	0.0	0.7	12-Oct-01 16:18	12-Oct-01 16:58
Arrive Dutch Harbor	53	54.5	N	166	30.9	W	254.9	10.0	21.4	0.0	13-Oct-01 14:22	

6.3. Mooring Diagrams

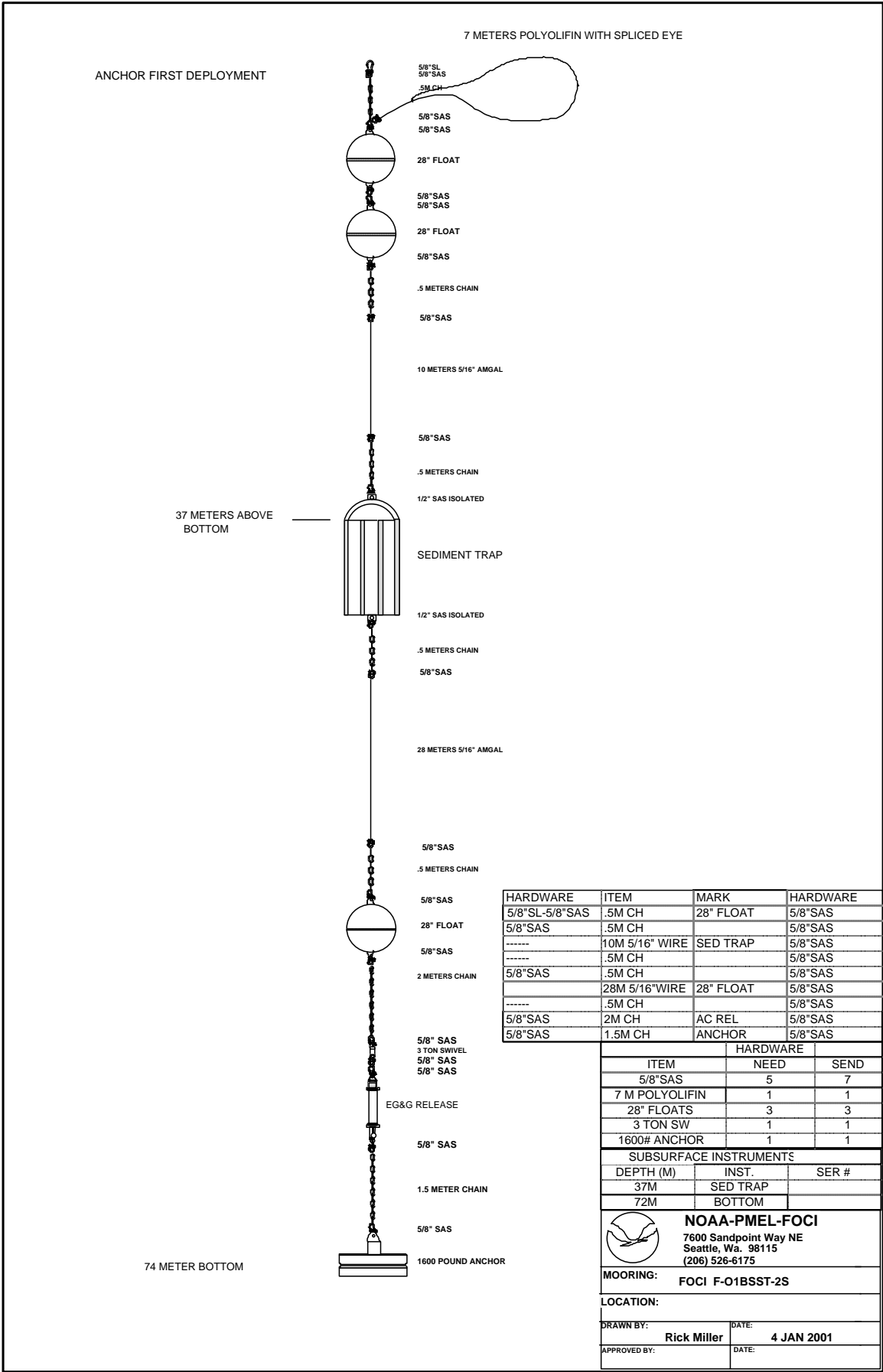
6.3.1. Site #4 moorings (1 recovery, 1 deployment, similar moorings)



6.3.2. Site #2 moorings (4 recoveries, 3 deployments)



6.3.3 Missing ADCP mooring diagram



7 METERS POLYOLIFIN WITH SPLICED EYE

ANCHOR FIRST DEPLOYMENT

37 METERS ABOVE
BOTTOM

74 METER BOTTOM

HARDWARE	ITEM	MARK	HARDWARE
5/8"SL-5/8"SAS	.5M CH	28" FLOAT	5/8"SAS
5/8"SAS	.5M CH		5/8"SAS
-----	10M 5/16" WIRE	SED TRAP	5/8"SAS
-----	.5M CH		5/8"SAS
5/8"SAS	.5M CH		5/8"SAS
-----	28M 5/16"WIRE	28" FLOAT	5/8"SAS
-----	.5M CH		5/8"SAS
5/8"SAS	2M CH	AC REL	5/8"SAS
5/8"SAS	1.5M CH	ANCHOR	5/8"SAS

ITEM	HARDWARE	
	NEED	SEND
5/8"SAS	5	7
7 M POLYOLIFIN	1	1
28" FLOATS	3	3
3 TON SW	1	1
1600# ANCHOR	1	1

SUBSURFACE INSTRUMENTS		
DEPTH (M)	INST.	SER #
37M	SED TRAP	
72M	BOTTOM	

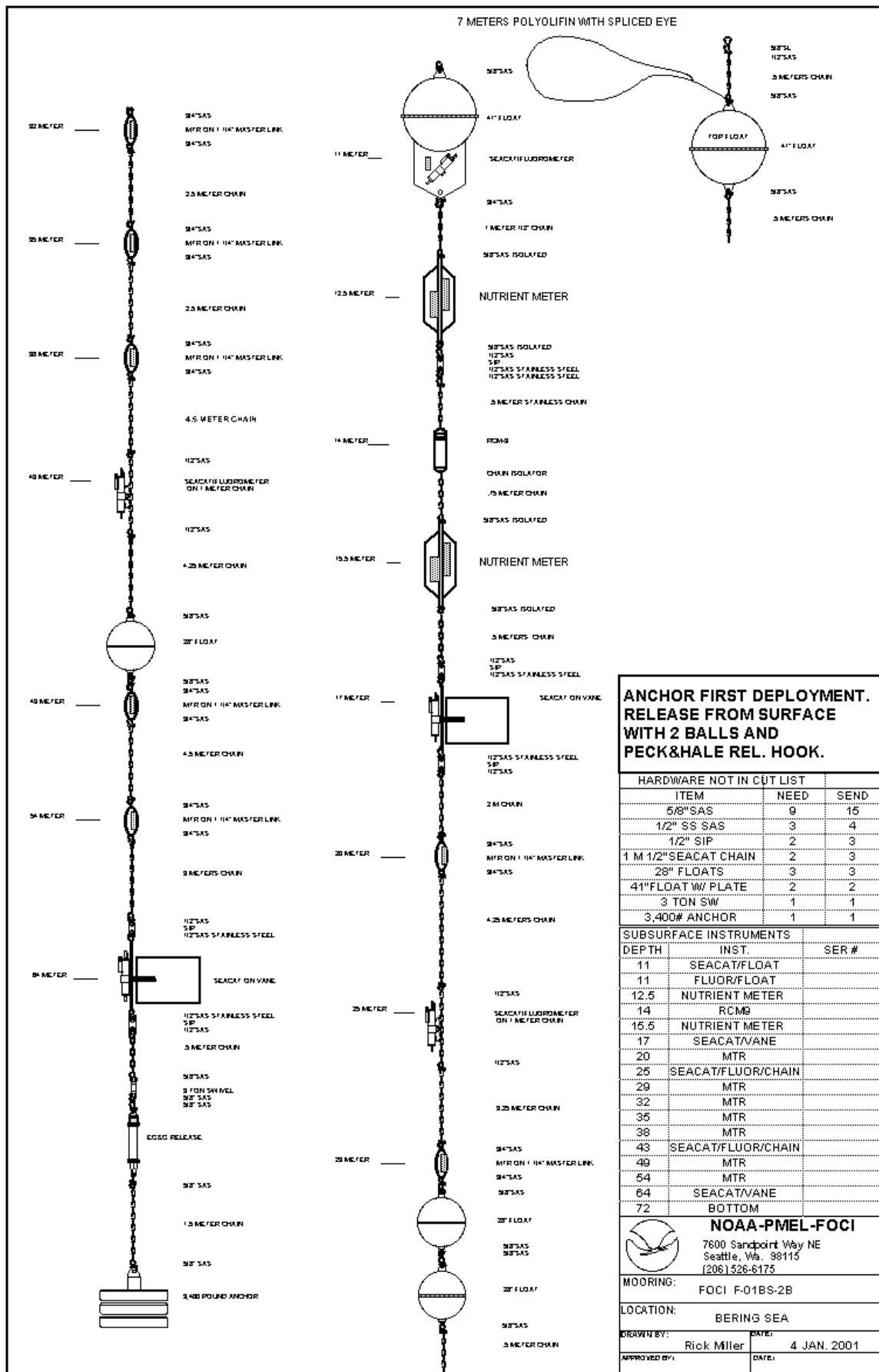
NOAA-PMEL-FOCI
 7600 Sandpoint Way NE
 Seattle, Wa. 98115
 (206) 526-6175

MOORING: FOCI F-01BSST-2S

LOCATION:

DRAWN BY: Rick Miller DATE: 4 JAN 2001

APPROVED BY: DATE:



ANCHOR FIRST DEPLOYMENT. RELEASE FROM SURFACE WITH 2 BALLS AND PECK&HALE REL. HOOK.

HARDWARE NOT IN CUT LIST		
ITEM	NEED	SEND
5/8" SAS	9	15
1/2" SS SAS	3	4
1/2" SIP	2	3
1 M 1/2" SEACAT CHAIN	2	3
28" FLOATS	3	3
41" FLOAT W/ PLATE	2	2
3 TON SW	1	1
3,400# ANCHOR	1	1

SUBSURFACE INSTRUMENTS		
DEPTH	INST.	SER #
11	SEACAT/FLOAT	
11	FLUOR/FLOAT	
12.5	NUTRIENT METER	
14	RCM9	
15.5	NUTRIENT METER	
17	SEACAT/VANE	
20	MTR	
25	SEACAT/FLUOR/CHAIN	
29	MTR	
32	MTR	
35	MTR	
38	MTR	
43	SEACAT/FLUOR/CHAIN	
49	MTR	
54	MTR	
64	SEACAT/VANE	
72	BOTTOM	

NOAA-PMEL-FOCI
 7600 Sandpoint Way NE
 Seattle, Wa. 98115
 (206) 526-6175

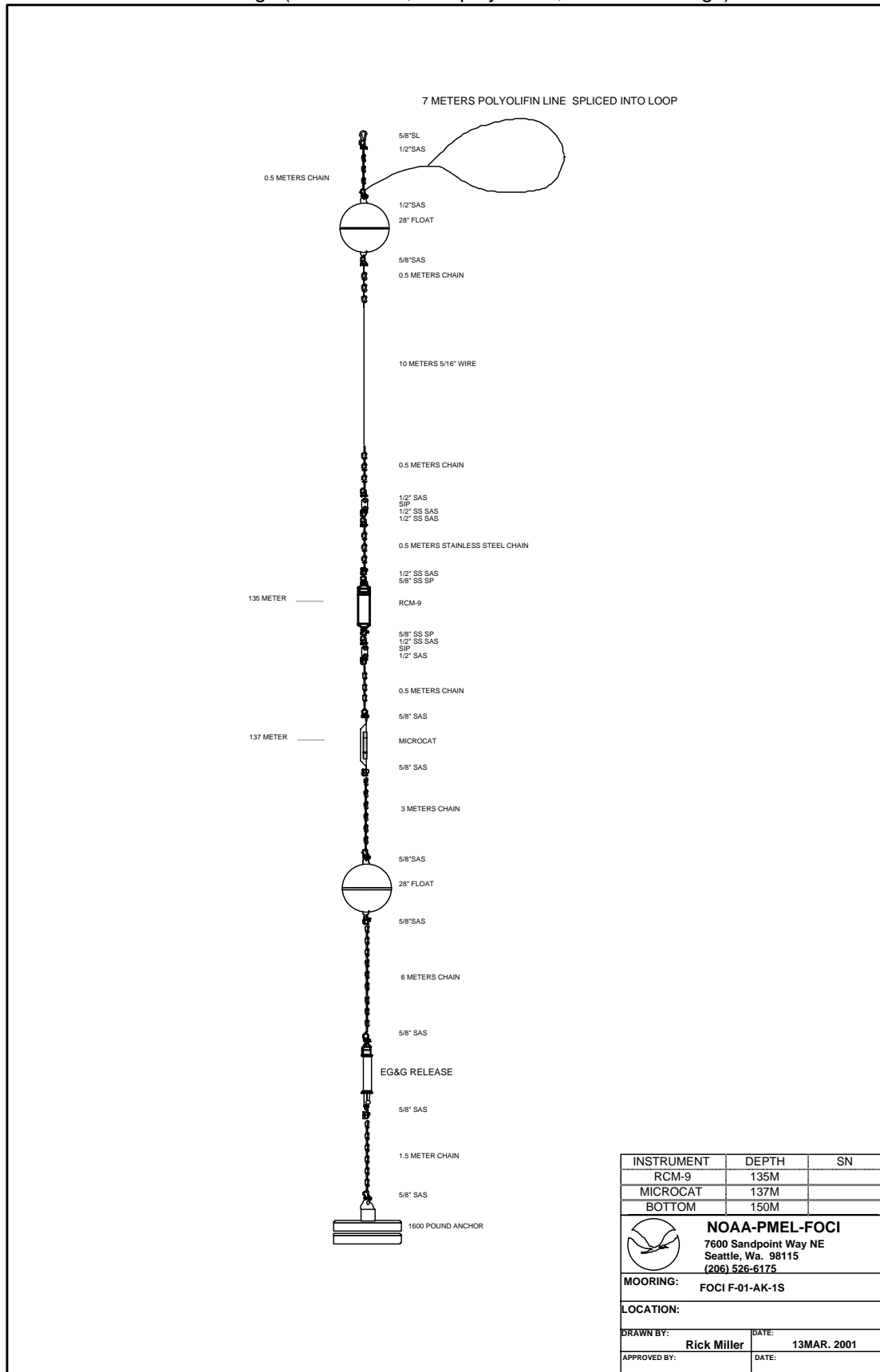
MOORING: FOCI F-01BS-2B

LOCATION: BERING SEA

DRAWN BY: Rick Miller DATE: 4 JAN. 2001

APPROVED BY: DATE:

6.3.6. Akutan Pass moorings (2 recoveries, 2 deployments, similar moorings)



INSTRUMENT	DEPTH	SN
RCM-9	135M	
MICROCAT	137M	
BOTTOM	150M	

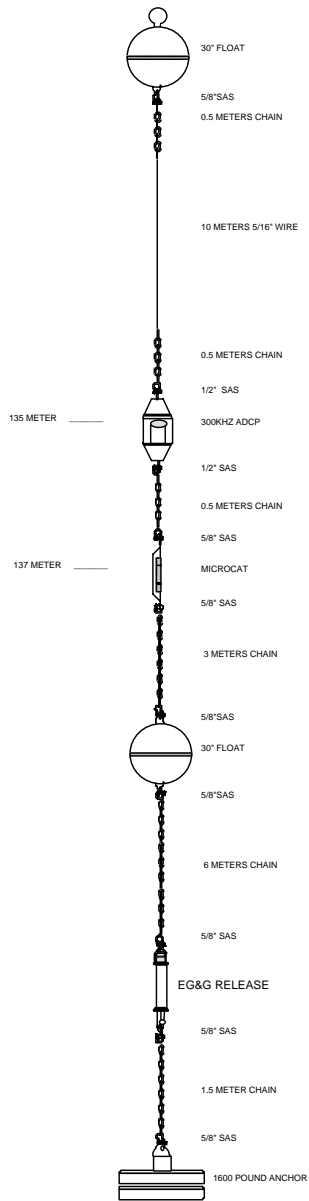
NOAA-PMEL-FOCI
 7600 Sandpoint Way NE
 Seattle, Wa. 98115
 (206) 526-6175

MOORING: FOCI F-01-AK-1S


LOCATION:

DRAWN BY: Rick Miller **DATE:** 13MAR. 2001

APPROVED BY: **DATE:**



INSTRUMENT	DEPTH	SN
300KHZ ADCP	135M	
MICROCAT	137M	
BOTTOM	150M	

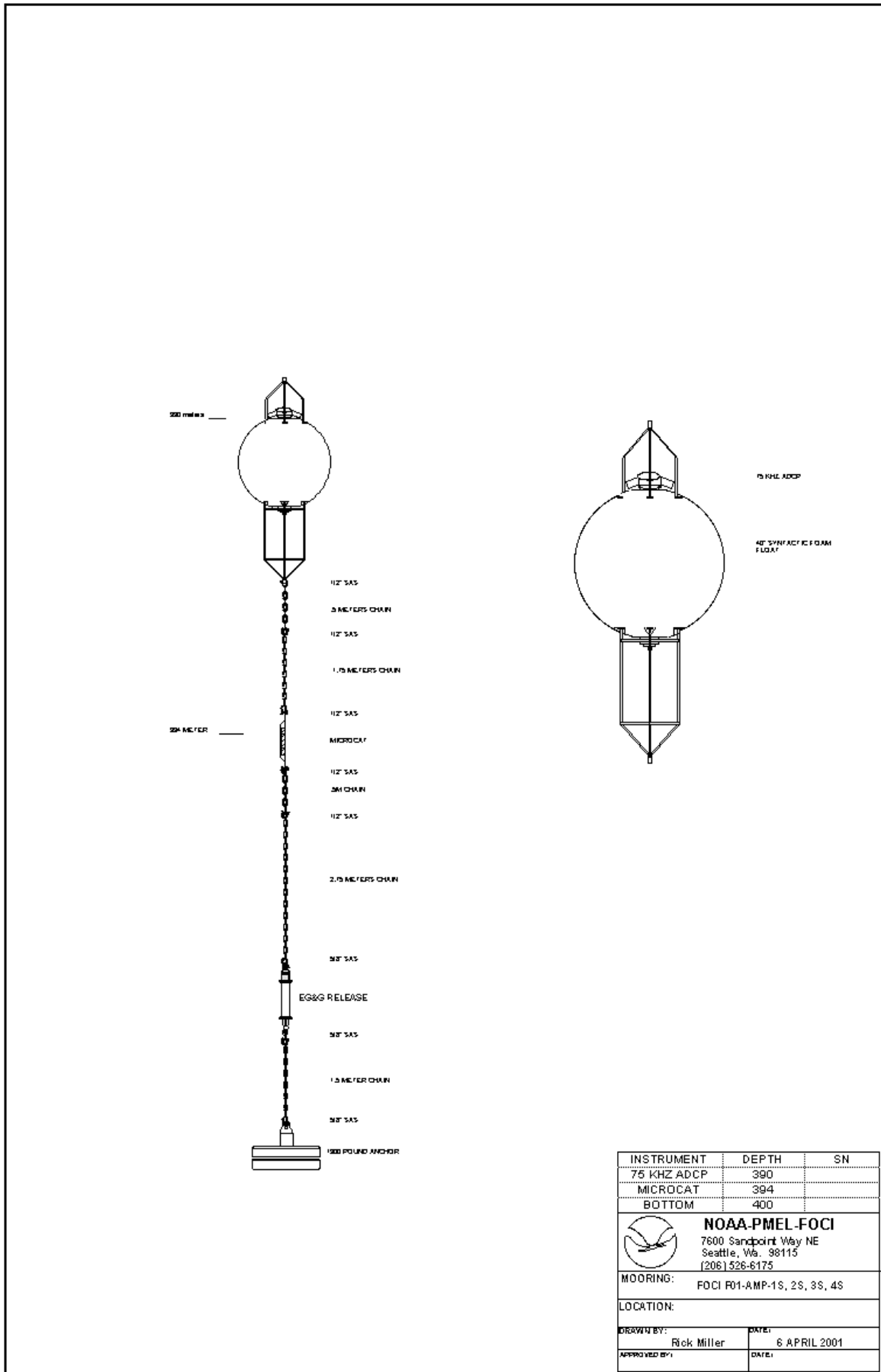

NOAA-PMEL-FOCI
 7600 Sandpoint Way NE
 Seattle, Wa. 98115
 (206) 526-6175

MOORING: FOCI F-01-AK-2S

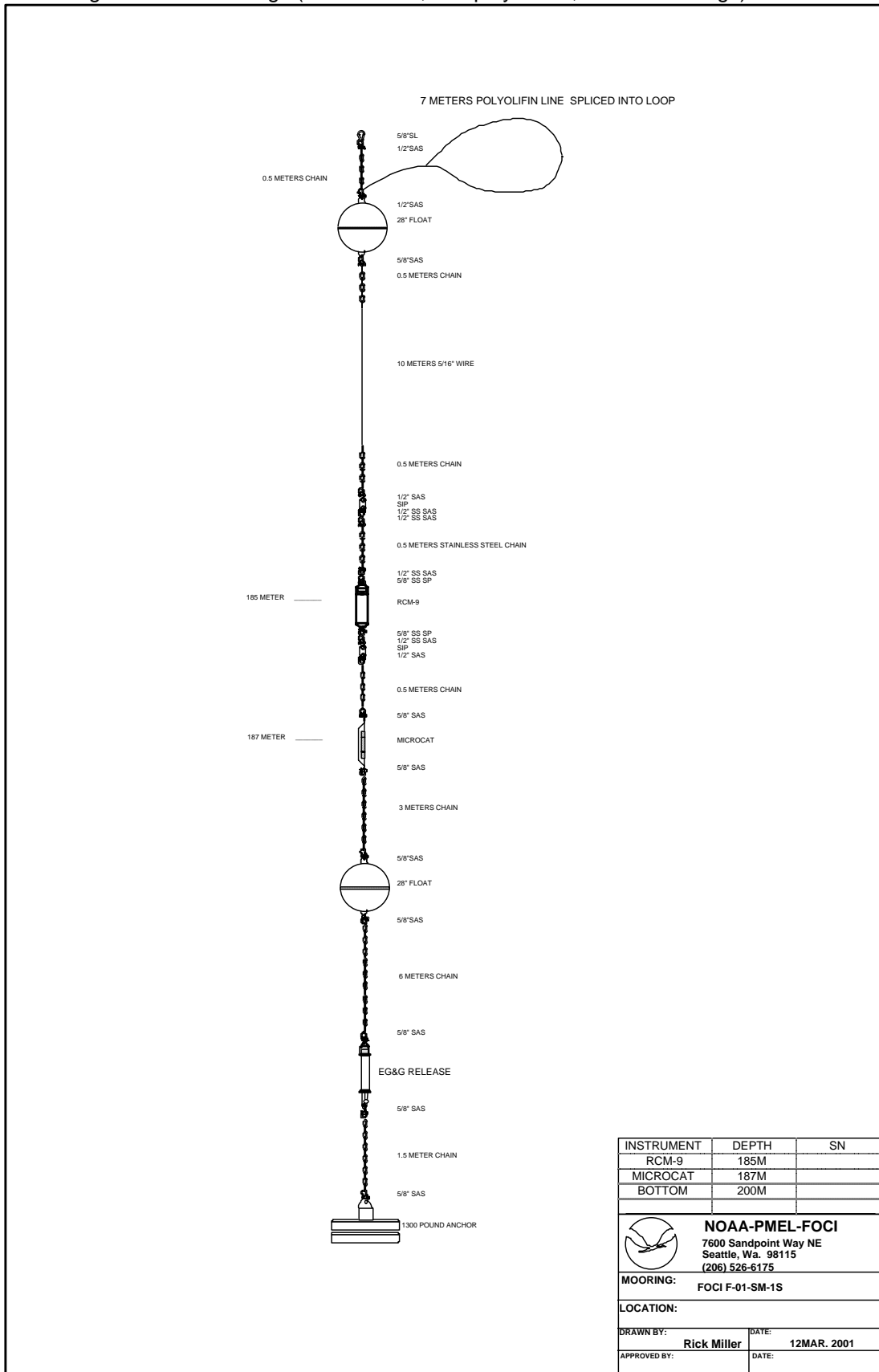
LOCATION:

DRAWN BY: Rick Miller	DATE: 13MAR. 2001
APPROVED BY:	DATE:


6.3.8. Amukta Pass moorings (4 recoveries, 4 deployments, similar moorings)

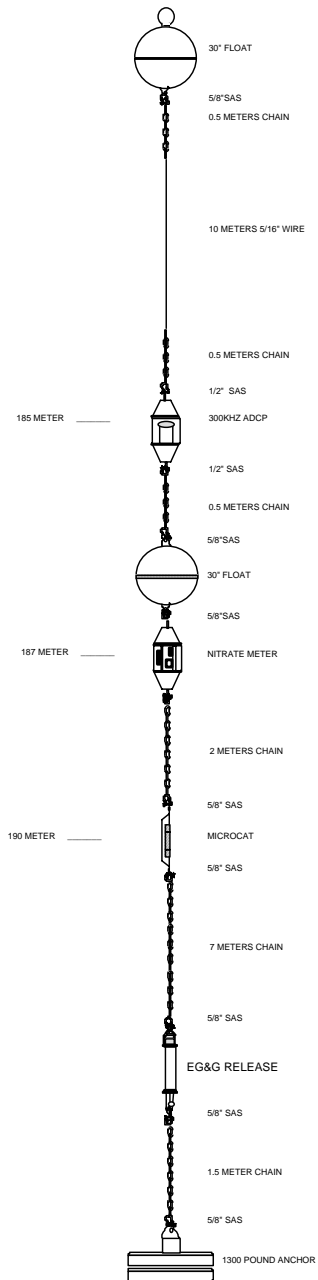


6.3.9. Seguam Pass moorings (2 recoveries, 2 deployments, similar moorings)




INSTRUMENT	DEPTH	SN
RCM-9	185M	
MICROCAT	187M	
BOTTOM	200M	

 NOAA-PMEL-FOCI 7600 Sandpoint Way NE Seattle, Wa. 98115 (206) 526-6175	
MOORING:	FOCI F-01-SM-1S
LOCATION:	
DRAWN BY:	DATE:
Rick Miller	12MAR. 2001
APPROVED BY:	DATE:



INSTRUMENT	DEPTH	SN
300KHZ ADCP	185M	
NITRATE	187M	
MICROCAT	190M	
BOTTOM	200M	

	NOAA-PMEL-FOCI	
	7600 Sandpoint Way NE Seattle, Wa. 98115 (206) 526-6175	
MOORING: FOCI F-01-SMP-2S		
LOCATION:		
DRAWN BY:	Rick Miller	DATE: 14MAR. 2001
APPROVED BY:		DATE: