4.6.3 Wave and Current

Three self-recording wave and current recorders (Wave Hunter) were installed at Stations No. 6, 8 and 15 at Sichon, Sakom and Thepha area as shown in Figures 4.6.2-1 to 4.6.2-3 for the period of about 15 days. The recorders could get continuous data of wave height, wave period, wave direction, current speed and current direction.

In addition, observations for littoral currents using floaters and by diffusion test (dye tracing using fluorescent sodium) were carried out. Outlines of the observations are shown below.

1) Wave

Results of the wave observation at station No. 8 in Sichon (water depth : -4.5m), Sakom (depth : -3m) and Thepha (depth : -3m) areas, are shown in Figures 4.6.3-1 to 4.6.3-4, Figures 4.6.3-5 to 4.6.3-8 and Figures 4.6.3-9 to 4.6.3-12, respectively.

The results of wave observation are summarized in Table 4.6.3-1.

Table 4.6.3-1 Summary of Wave Observation during February to April, 2001

Item	Sichon (Mar. 23 – Apr. 7)	Sakom (Mar. 8 – Mar. 22)	Thepha (Feb. 26 – Mar. 7)
Wave Height			
H_{max}	1.0 m	1.6 m	1.8 m
$H_{1/3}$ (Max)	0.6 m	0.9 m	0.8 m
Frequency : 1st	< 0.25 m (65%)	0.25 – 0.50 m (47%)	0.25 – 0.50 m (52%)
2nd	0.25 – 0.50 m (31%)	0.50 – 0.75 m (37%)	0.50 – 0.75 m (45%)
3rd	> 0.50 m (4%)	0.75 – 1.00 m (9%)	0.75 – 1.00 m (3%)
Wave Period	2.3 sec – 7.2 sec	2.5 sec – 11.0 sec	2.5 sec – 14.5 sec
Frequency : 1st	4.0 – 5.0 sec (56%)	4.0 – 5.0 sec (33%)	3.0 – 4.0 sec (38%)
2nd	3.0 – 4.0 sec (36%)	3.0 – 4.0 sec (32%)	4.0 – 5.0 sec (19%)
3rd	< 3.0 sec (8%)	5.0 – 6.0 sec (24%)	6.0 – 7.0 sec (18%)
Wave Direction	NNE – ESE	NNE – ENE	NE – ENE
Frequency : 1st	E (62%)	NE (87%)	NE (62%)
2nd	ENE (23%)	NNE (13%)	ENE (23%)
3rd	ESE (10%)	–	–

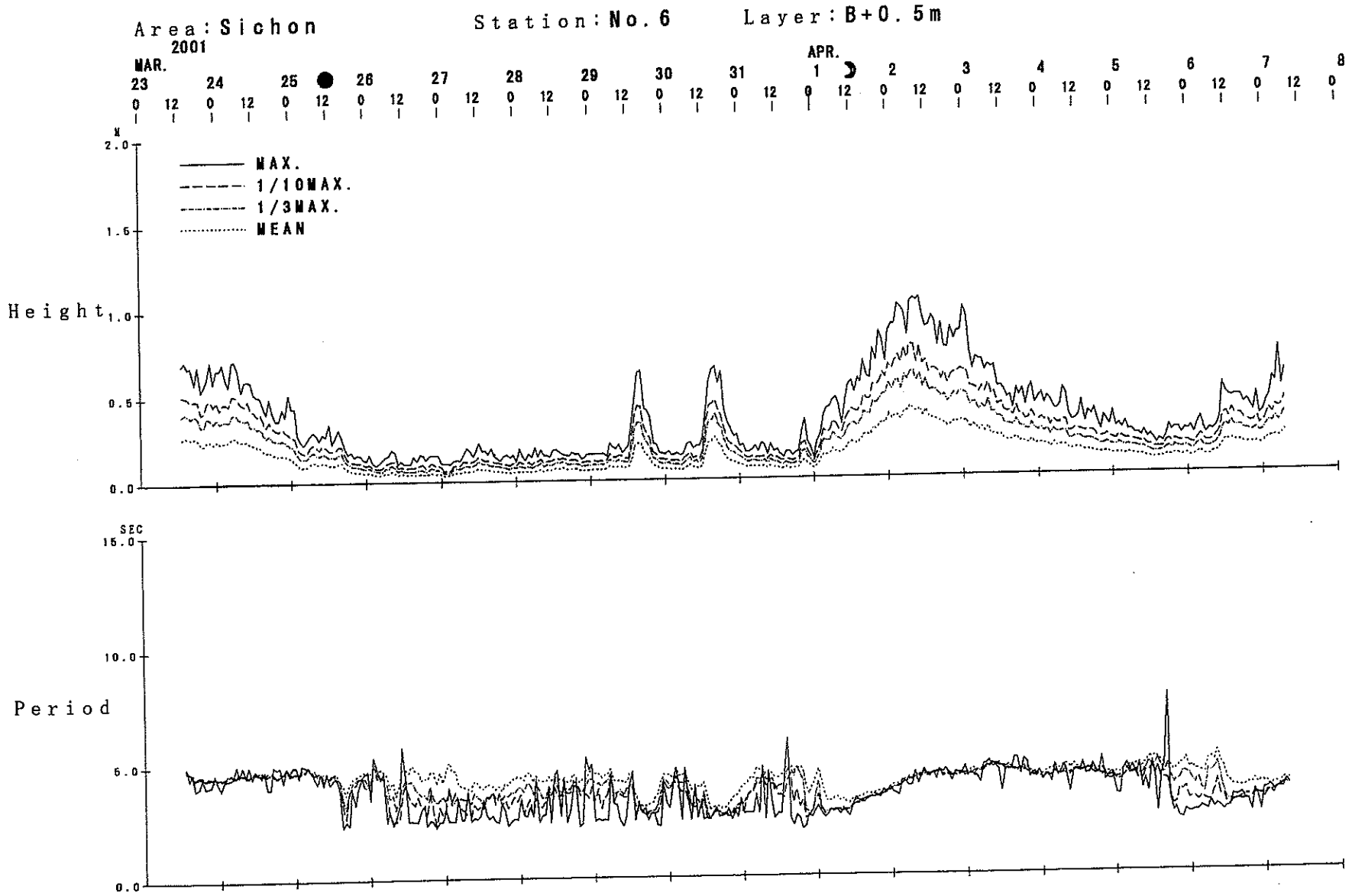


Figure 4.6.3-1 Diagram of Wave Height and Wave Period in Sichon

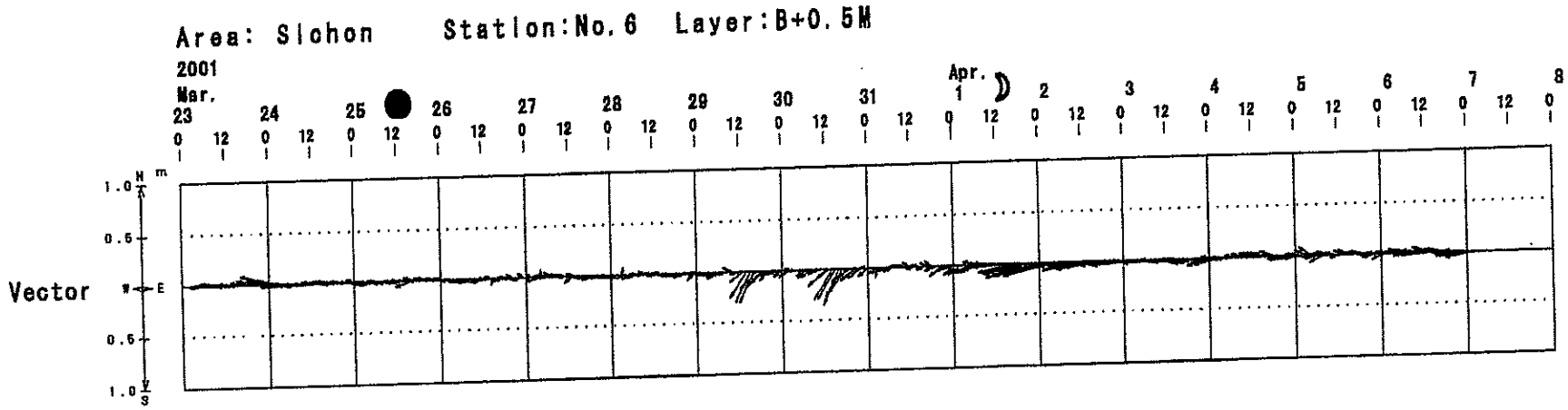


Figure 4.6.3-2 Diagram of Wave Direction in Sichon

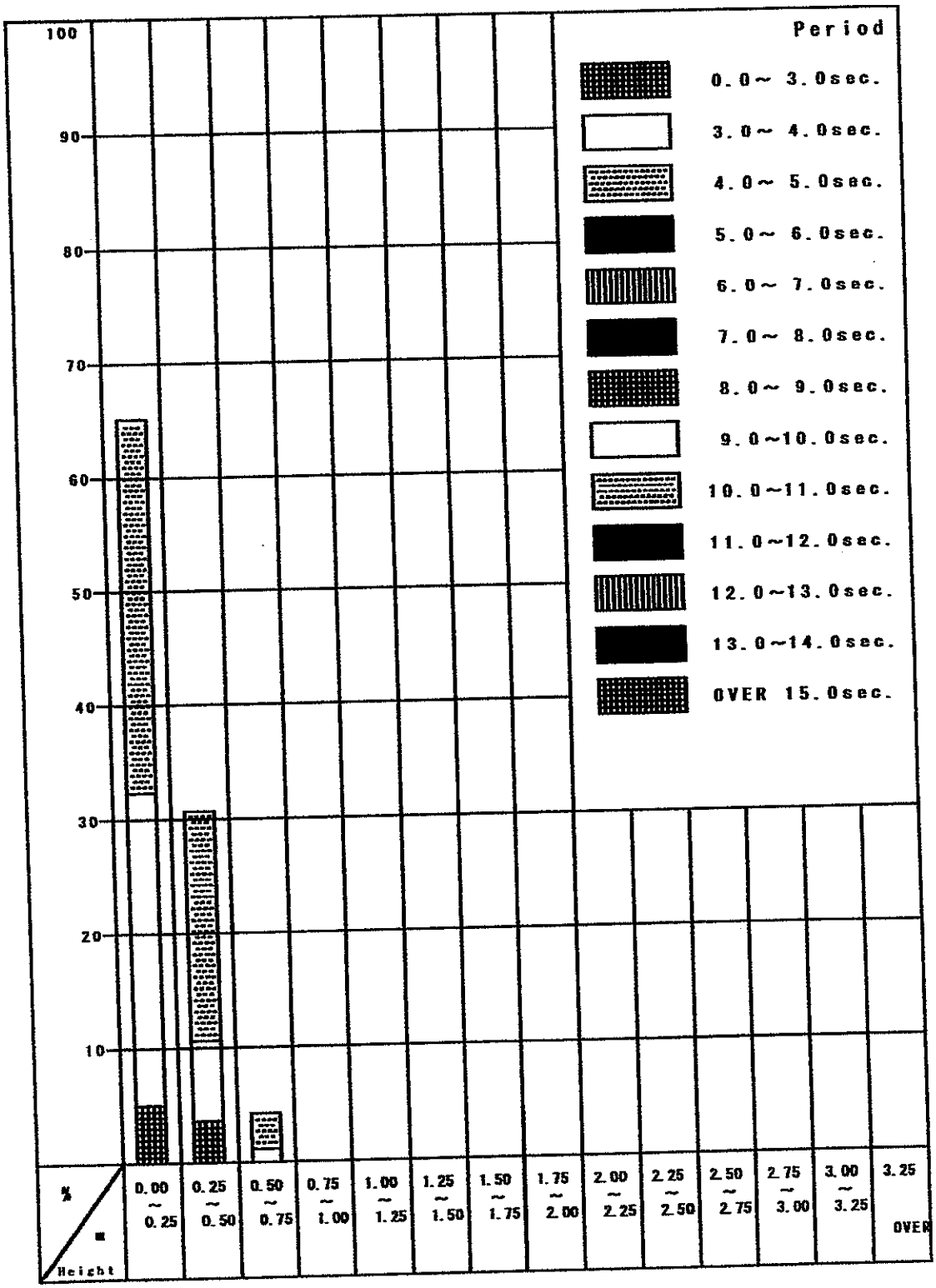
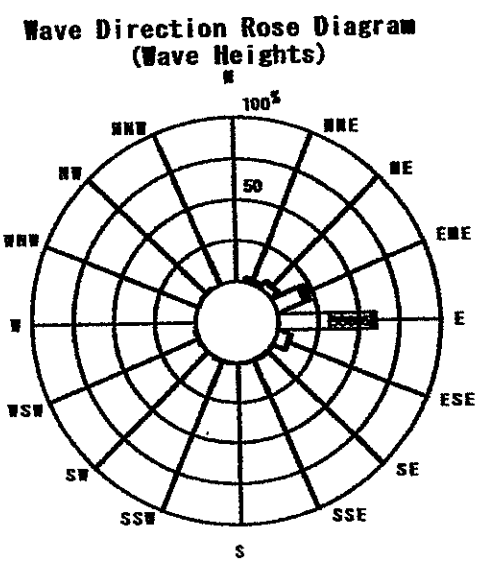
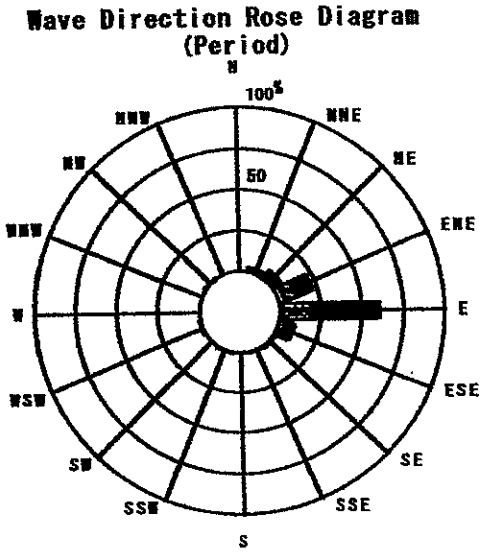


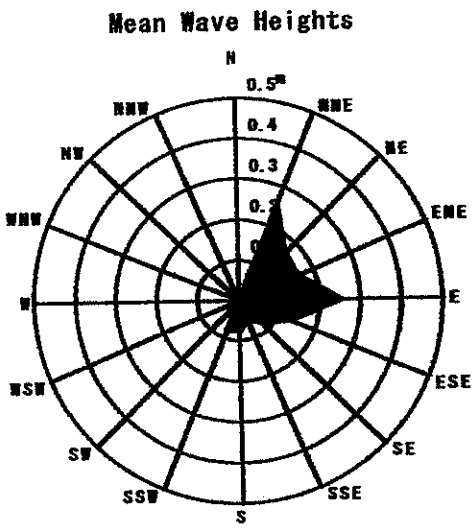
Figure 4.6.3-3 Frequency of Wave Height and Wave Period in Sichon

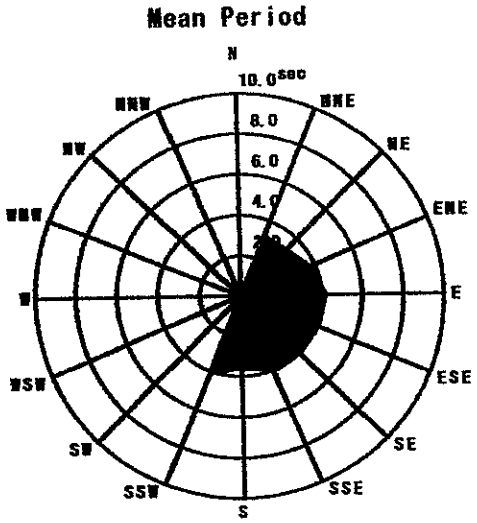
Area：Sichon　Station：No. 6　Layer：B+0. 5m

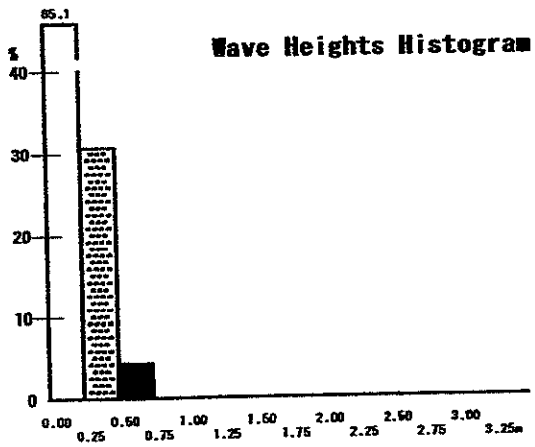
2001. 3. 23～ 4. 7











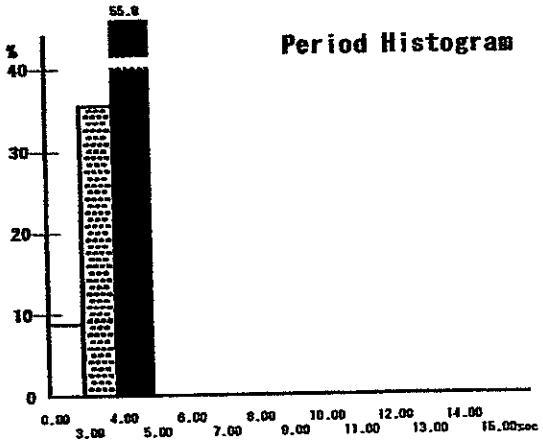


Figure 4.6.3-4　Frequency of Wave Direction in Sichon

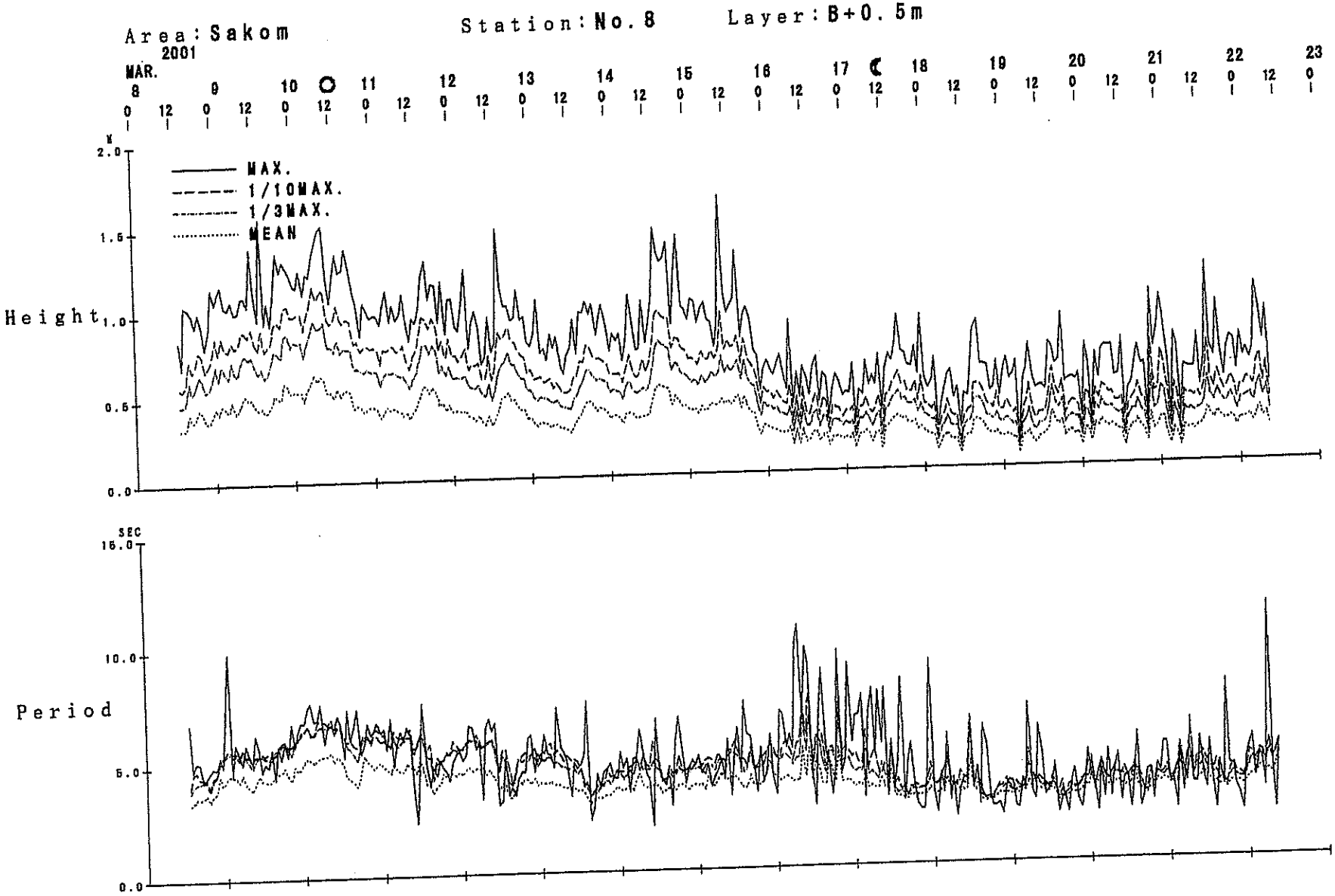


Figure 4.6.3-5 Diagram of Wave Height and Wave Period in Sakom

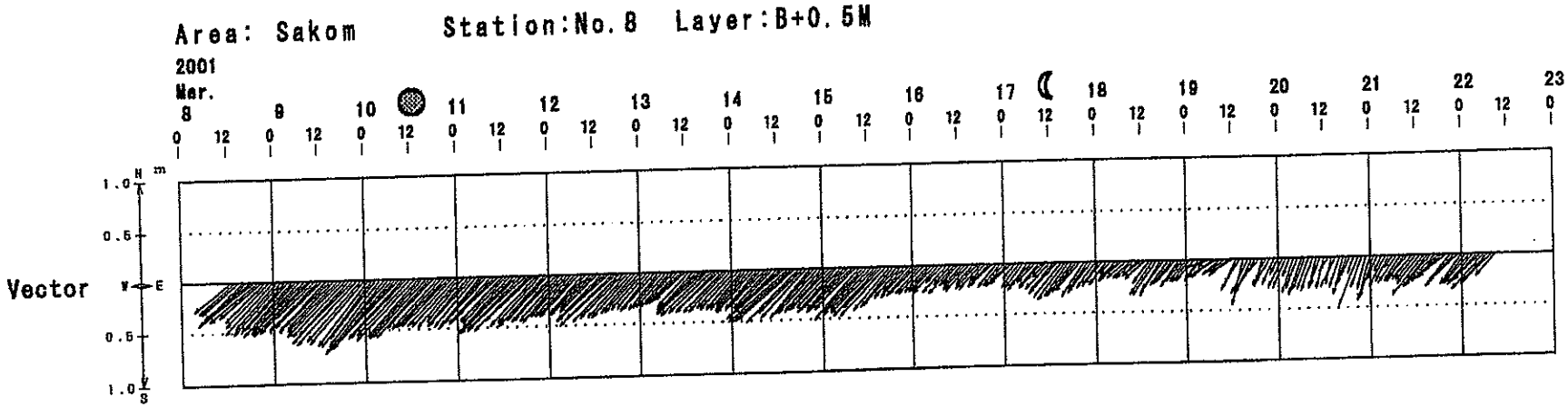


Figure 4.6.3-6 Diagram of Wave Direction in Sakom

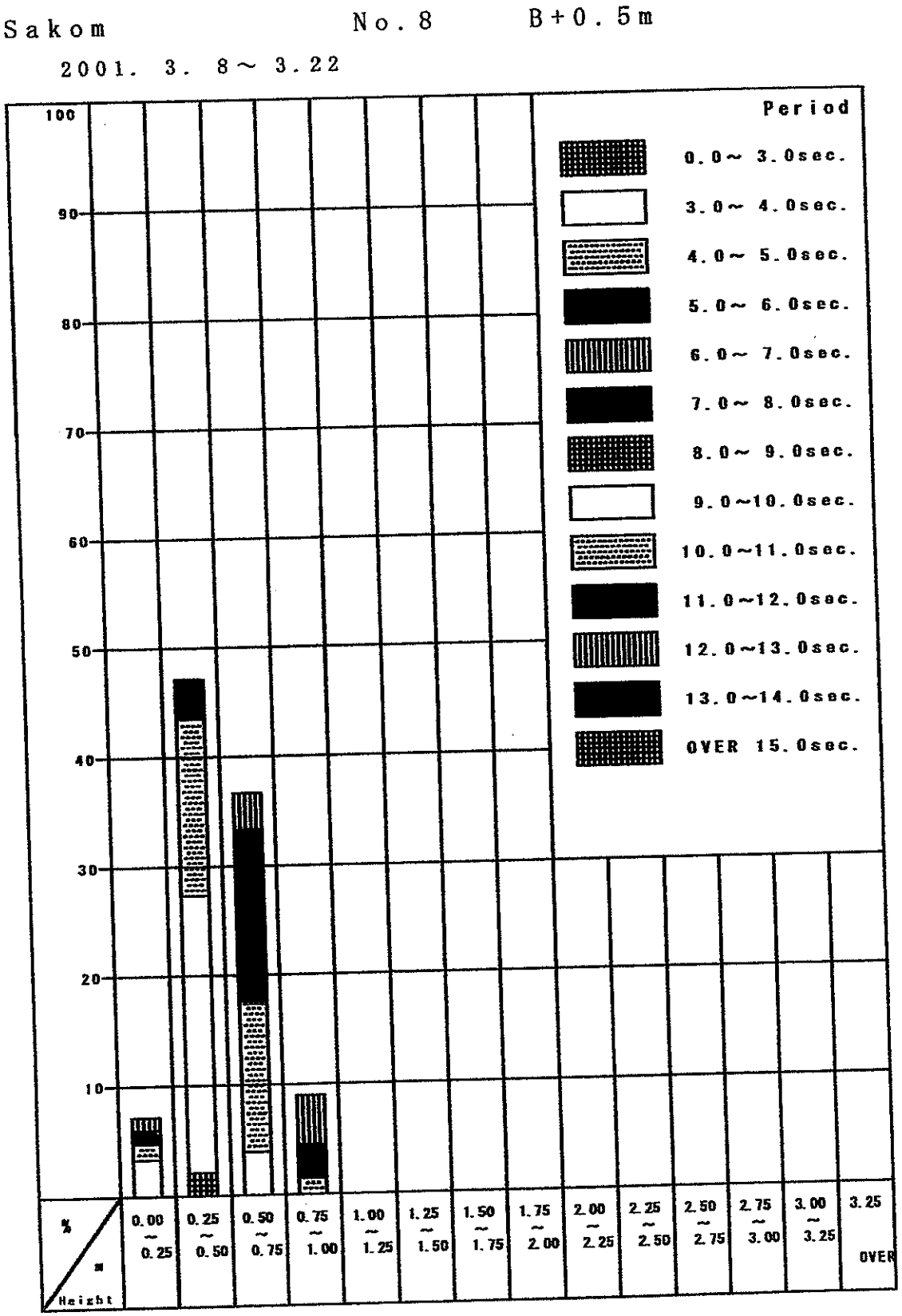


Figure 4.6.3-7 Frequency of Wave Height and Wave Period in Sakom

Area：Sakom　　Station：No. 8　　Layer：B+0. 5m

2001. 3. 8～ 3.22

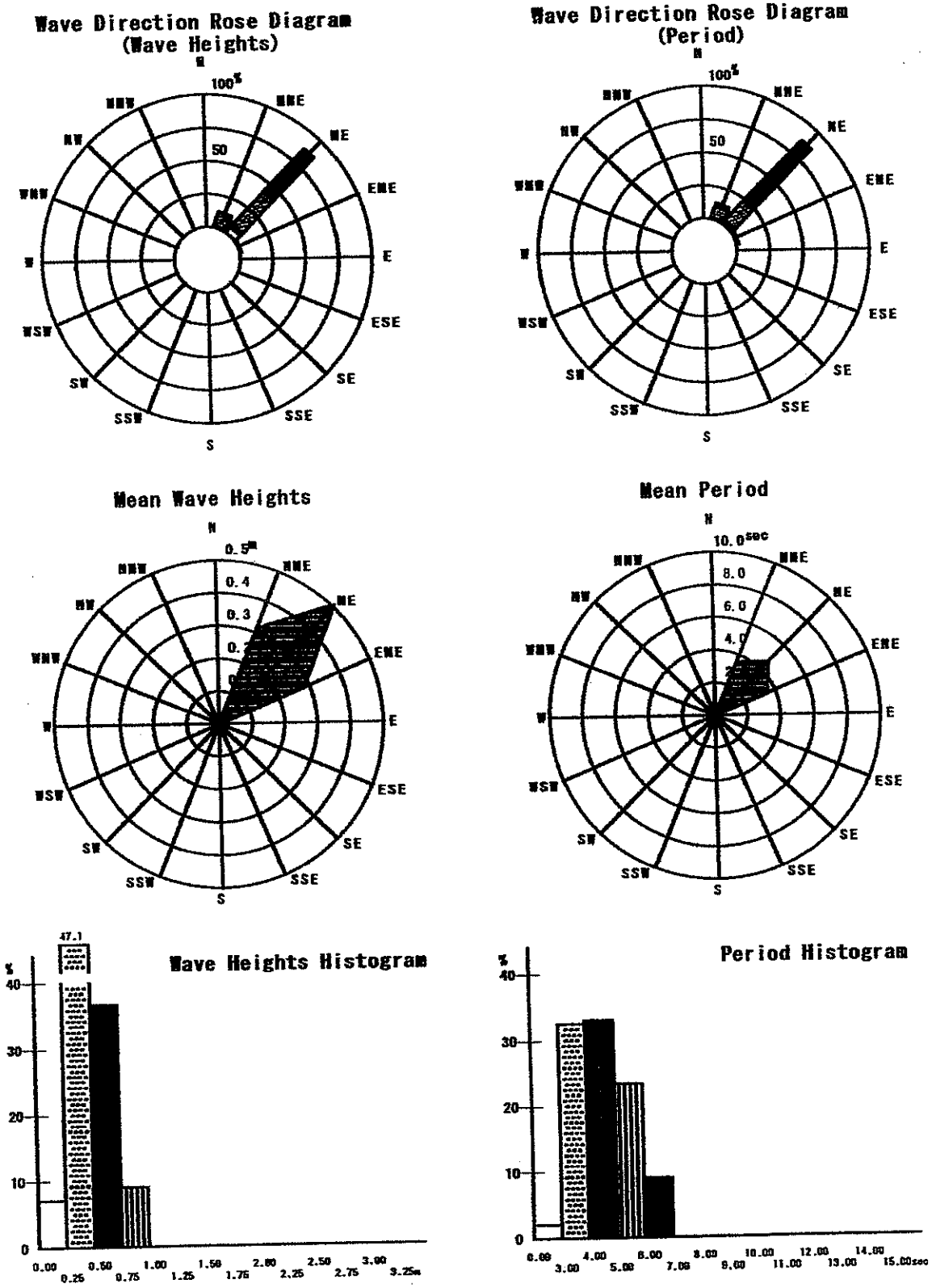


Figure 4.6.3-8　Frequency of Wave Direction in Sakom

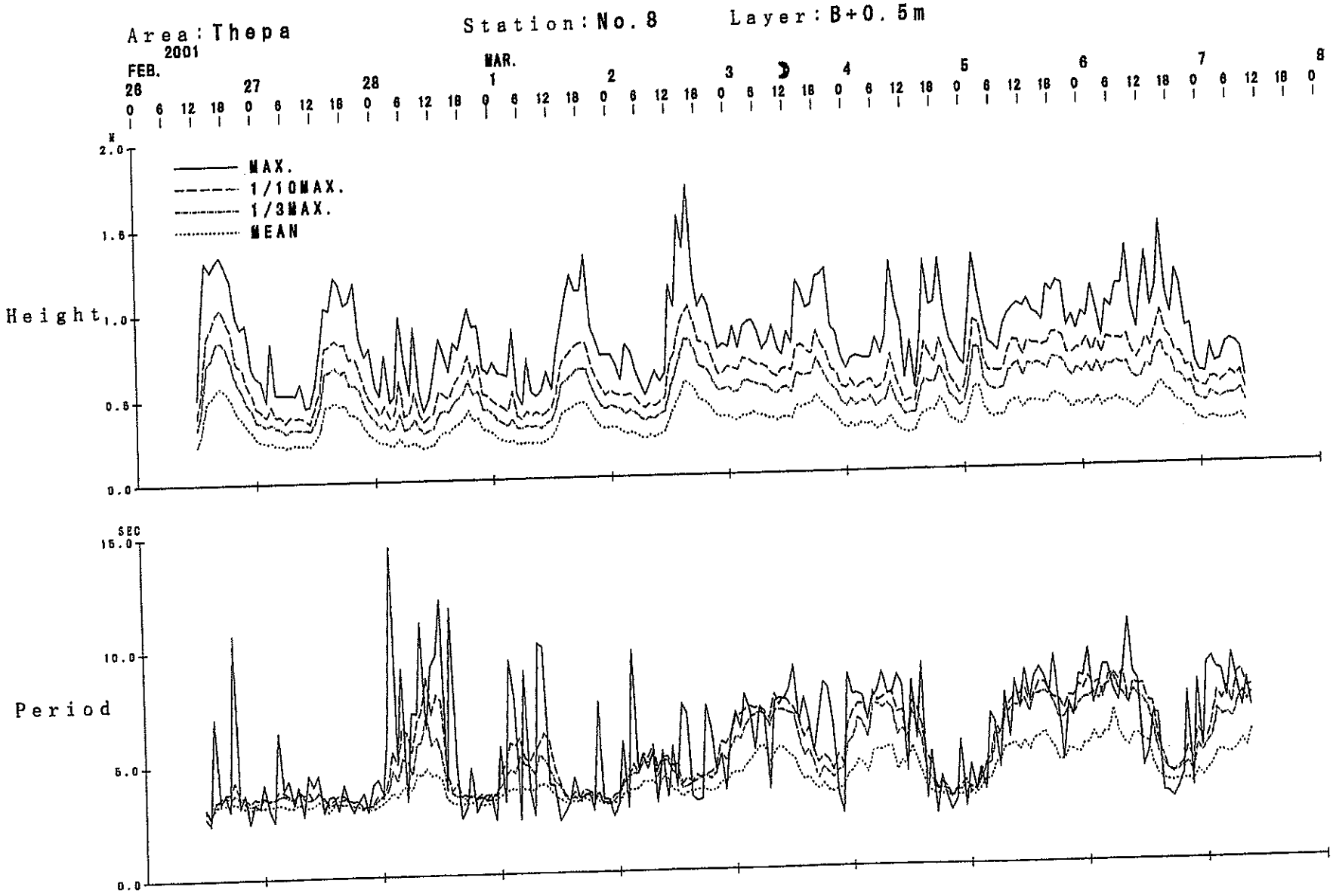


Figure 4.6.3-9 Diagram of Wave Height and Wave Period in Thepha

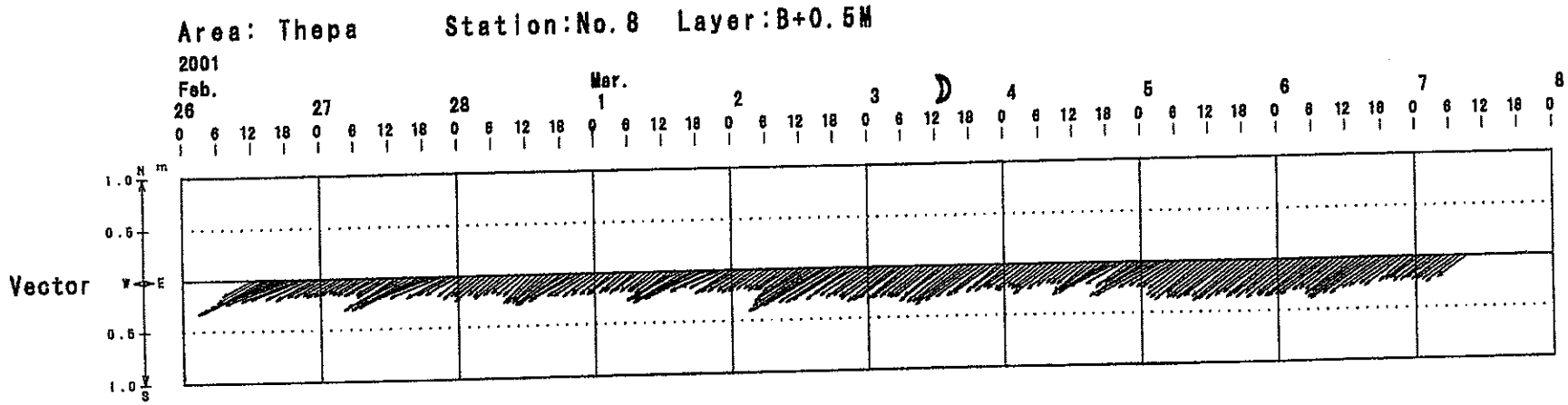


Figure 4.6.3-10 Diagram of Wave Direction in Thepha

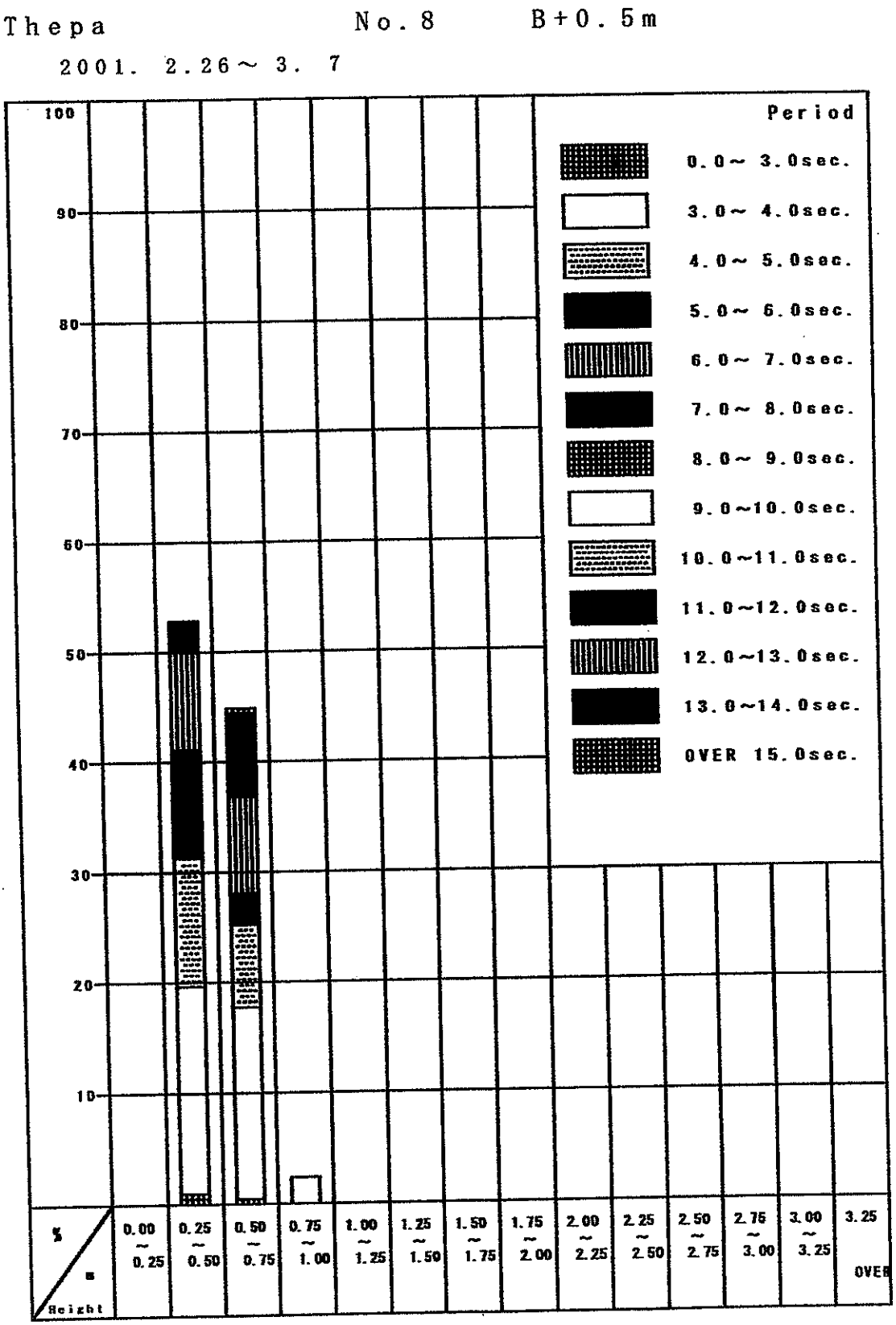


Figure 4.6.3-11 Frequency of Wave Height and Wave Period in Thepha

Area：Thepa　　Station：No. 8　　Layer：B+0.5m

2001. 2.26～ 3. 7

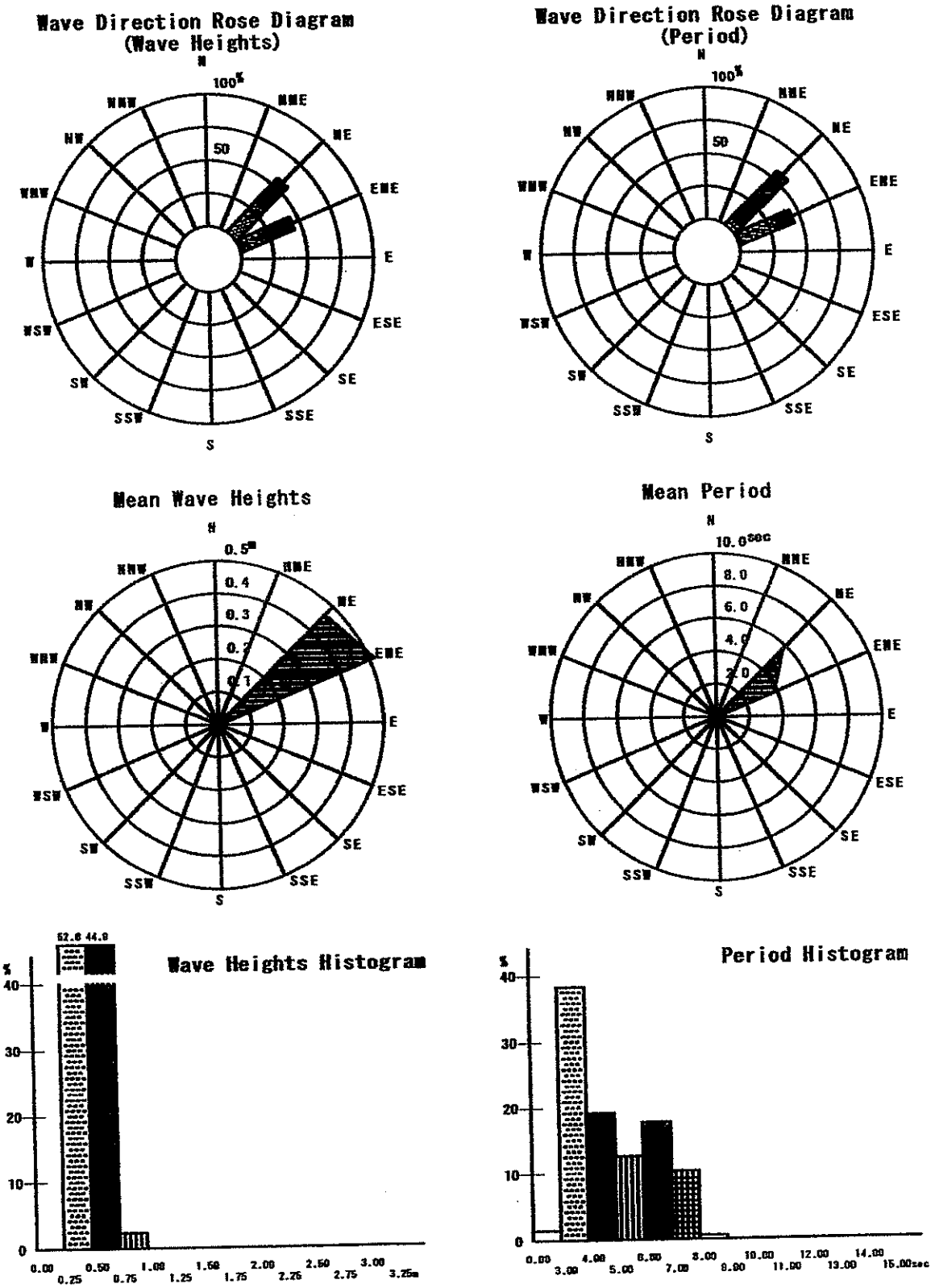


Figure 4.6.3-12　Frequency of Wave Direction in Thepha

2) Current

Results of the current observation are shown in Figures 4.6.3-13 to 4.6.3-15 at stations No. 6 and No.15 in Sichon, Figures 4.6.3-16 to 4.6.3-20 at stations No. 6, No. 8 and No.15 in Sakom, and Figures 4.6.3-21 to 4.6.3-25 at stations No. 6, No. 8 and No.15 in Thepha.

The result of current observation is summarized in Table 4.6.3-2.

Table 4.6.3-2 Summary of Current Observation during February to April, 2001

Item	Sichon (Mar. 23 – Apr. 7)		Sakom (Mar. 8 – Mar. 22)			Thepha (Feb. 28 – Mar. 7)		
	No. 6	No.15	No. 6	No. 8	No.15	No. 6	No. 8	No.15
Speed								
Maximum	9 cm/s (NW)	5 cm/s (NNW) (SSE)	40 cm/s (N)	17 cm/s (WNW)	8 cm/s (W)	30 cm/s (NW)	25 cm/s (NW)	13 cm/s (WNW) (ESE)
Frequency								
1st	< 5cm/s (97 %)	< 5cm/s (99 %)	< 5cm/s (74 %)	<5 cm/s (64 %)	<5 cm/s (96 %)	<5 cm/s (85 %)	5-10cm/s (35 %)	< 5cm/s (65 %)
2nd	5-10cm/s (3 %)	5-10cm/s (1 %)	5-10cm/s (22 %)	5-10cm/s (29 %)	5-10cm/s (4 %)	5-10cm/s (6 %)	10-15cm/s (22 %)	5-10cm/s (29 %)
Direction								
Frequency								
1st	NW (17 %)	SE (50 %)	SE (17 %)	WNW (13 %)	SSE (65 %)	SE (17 %)	NW (62 %)	ESE (21 %)
2nd	WSW (16.5%)	SSE (30 %)	SSE (15 %)	WSW (11 %)	SE (14 %)	SSE (16 %)	WNW (17 %)	SE (16 %)
3rd	WNW (16.5%)	ESE (10 %)	S (12 %)	W (11 %)	ESE (7 %)	NW (16 %)	NNW (10%)	WNW (12 %)

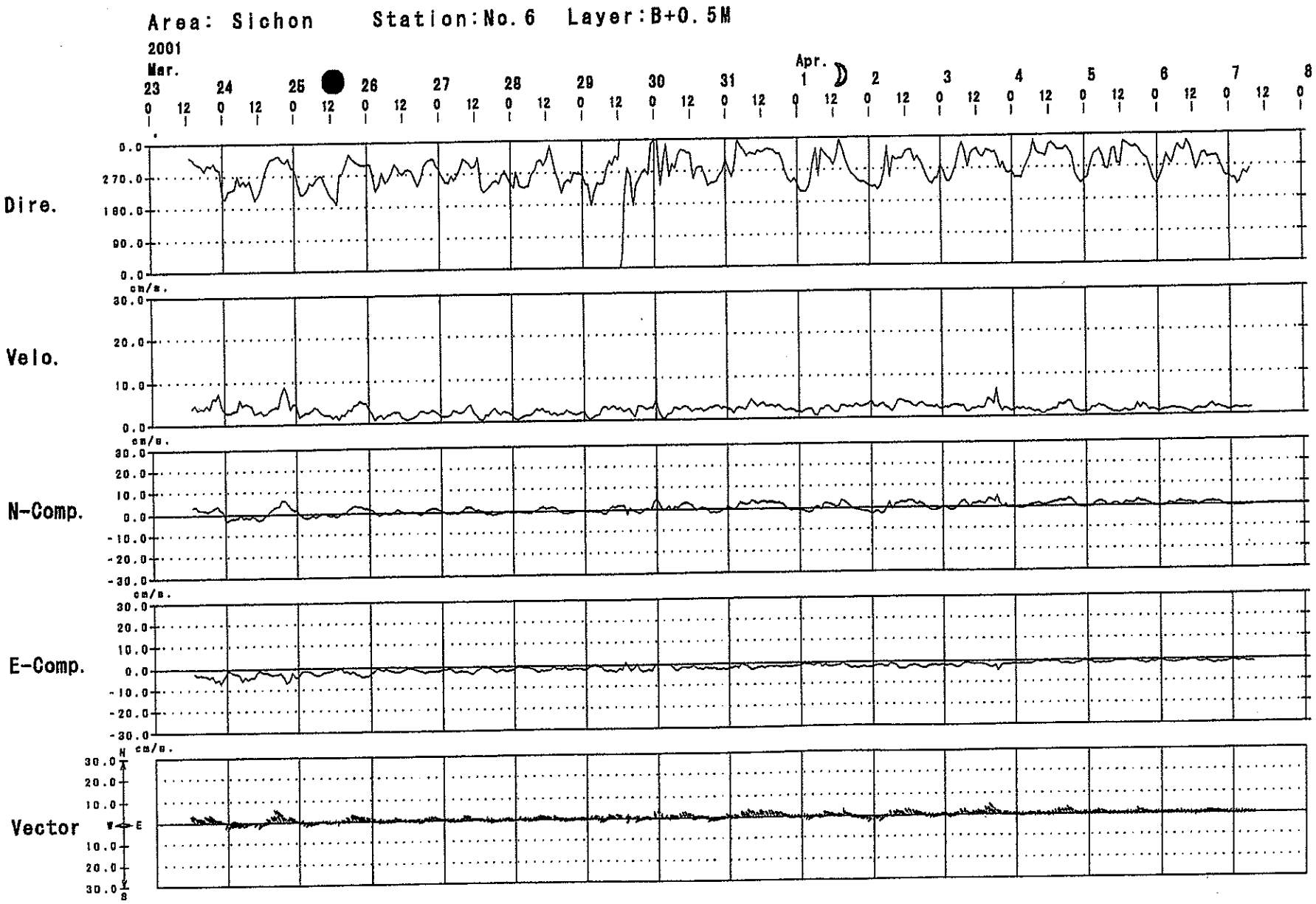


Figure 4.6.3-13 Current Diagram at Station No. 6 in Sichon

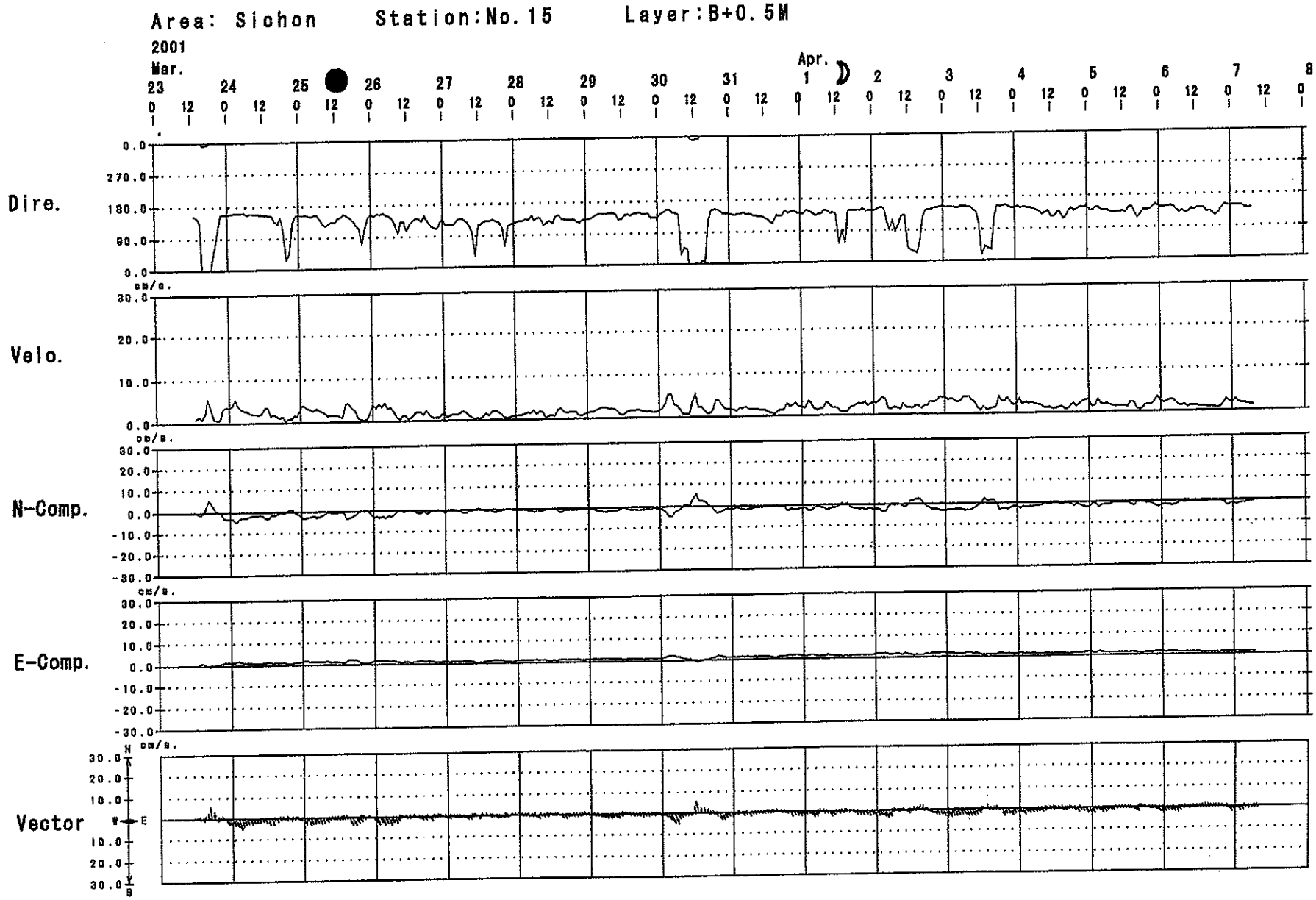


Figure 4.6.3-14 Current Diagram at Station No. 15 in Sichon

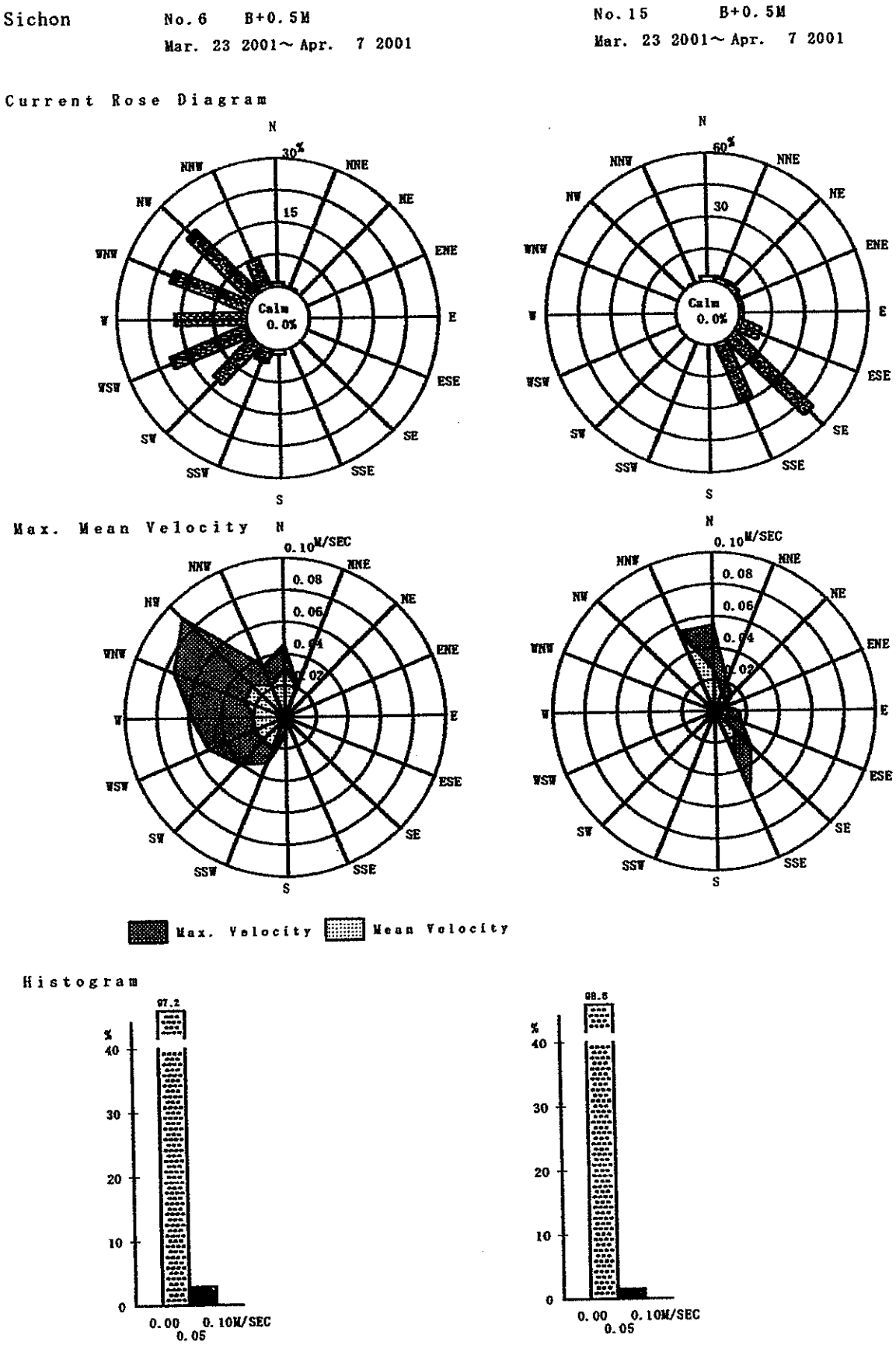


Figure 4.6.3-15 Frequency of Current at Station No. 6 and No. 15 in Sichon

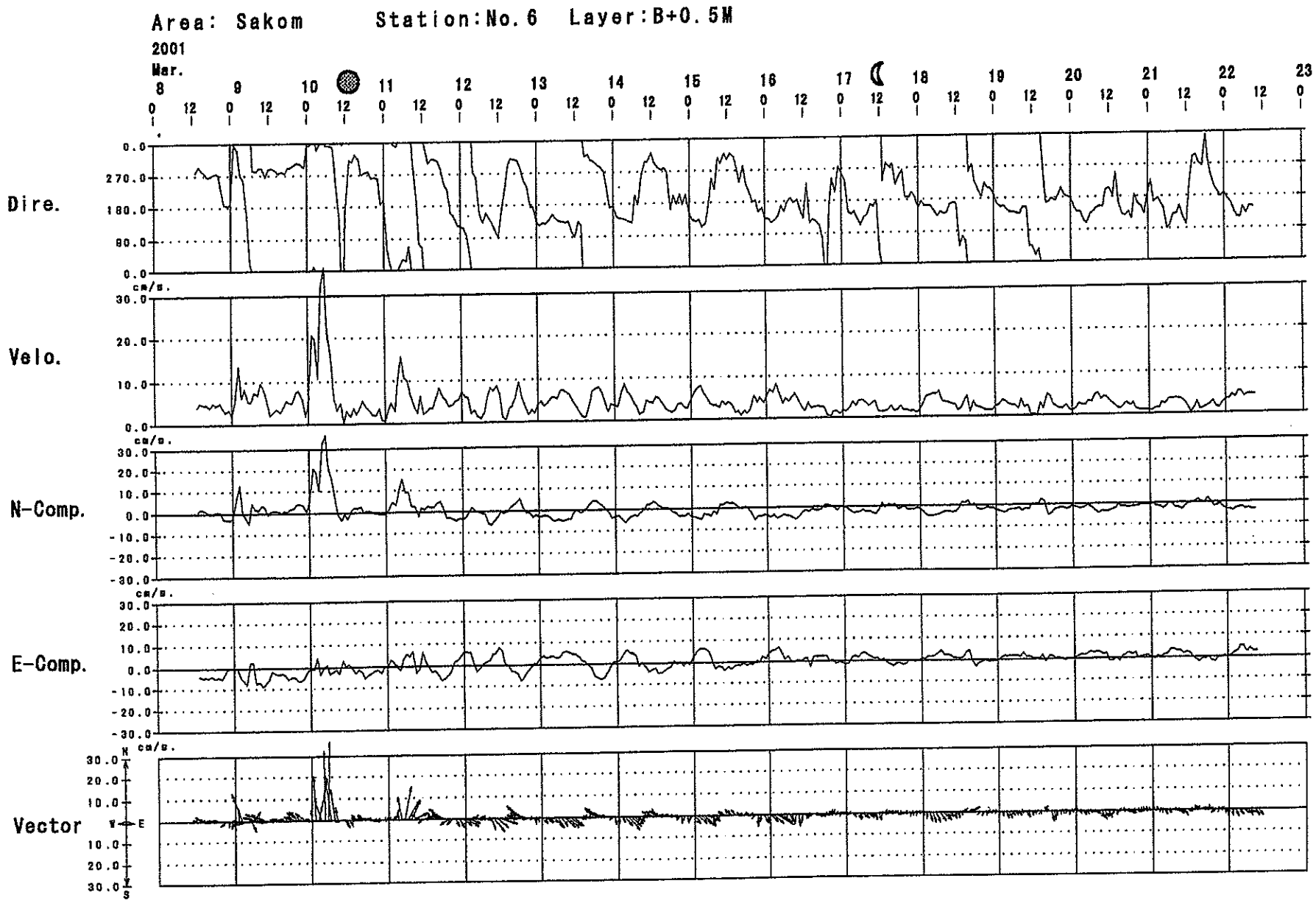


Figure 4.6.3-16 Current Diagram at Station No. 6 in Sakom

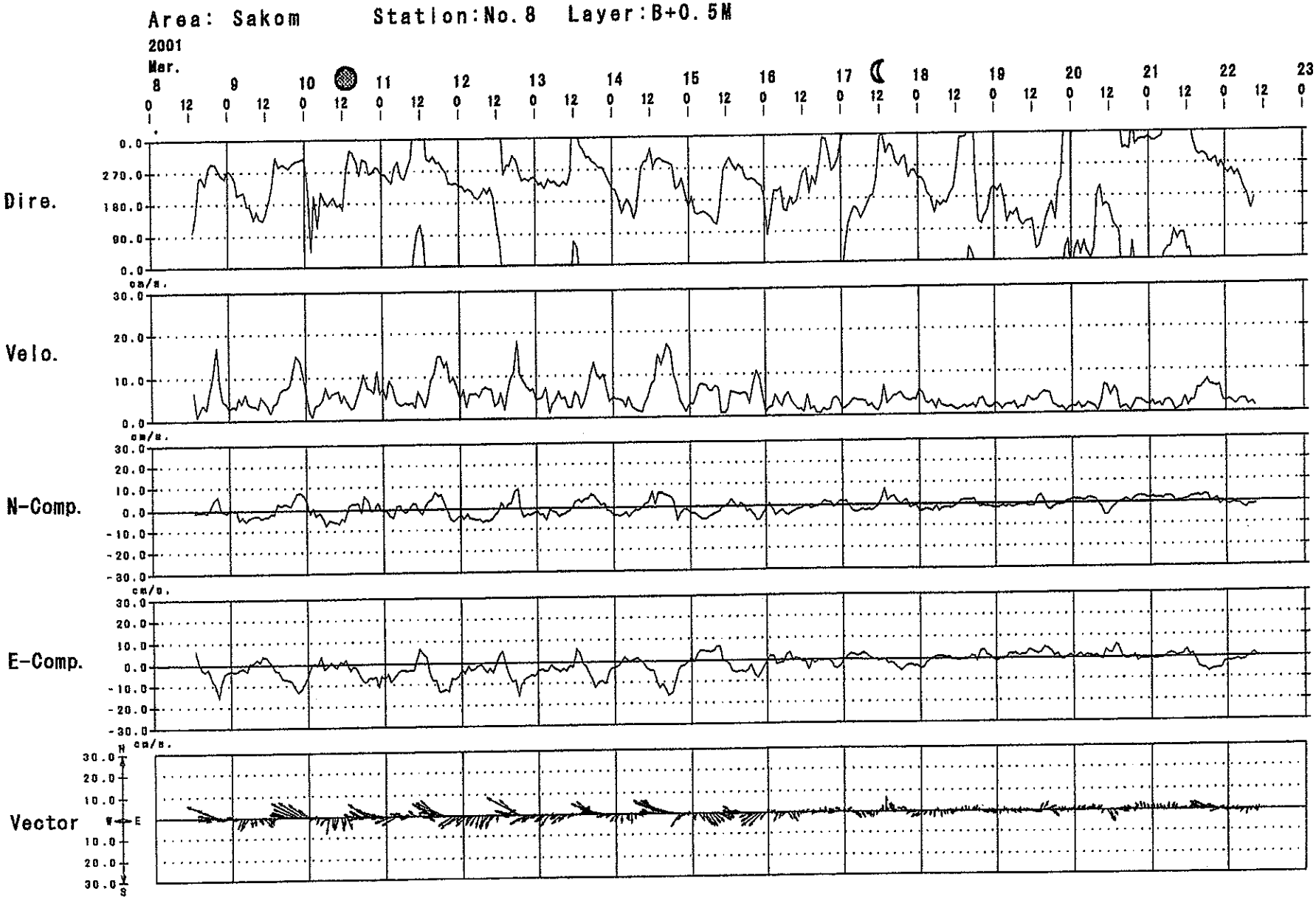


Figure 4.6.3-17 Current Diagram at Station No. 8 in Sakom

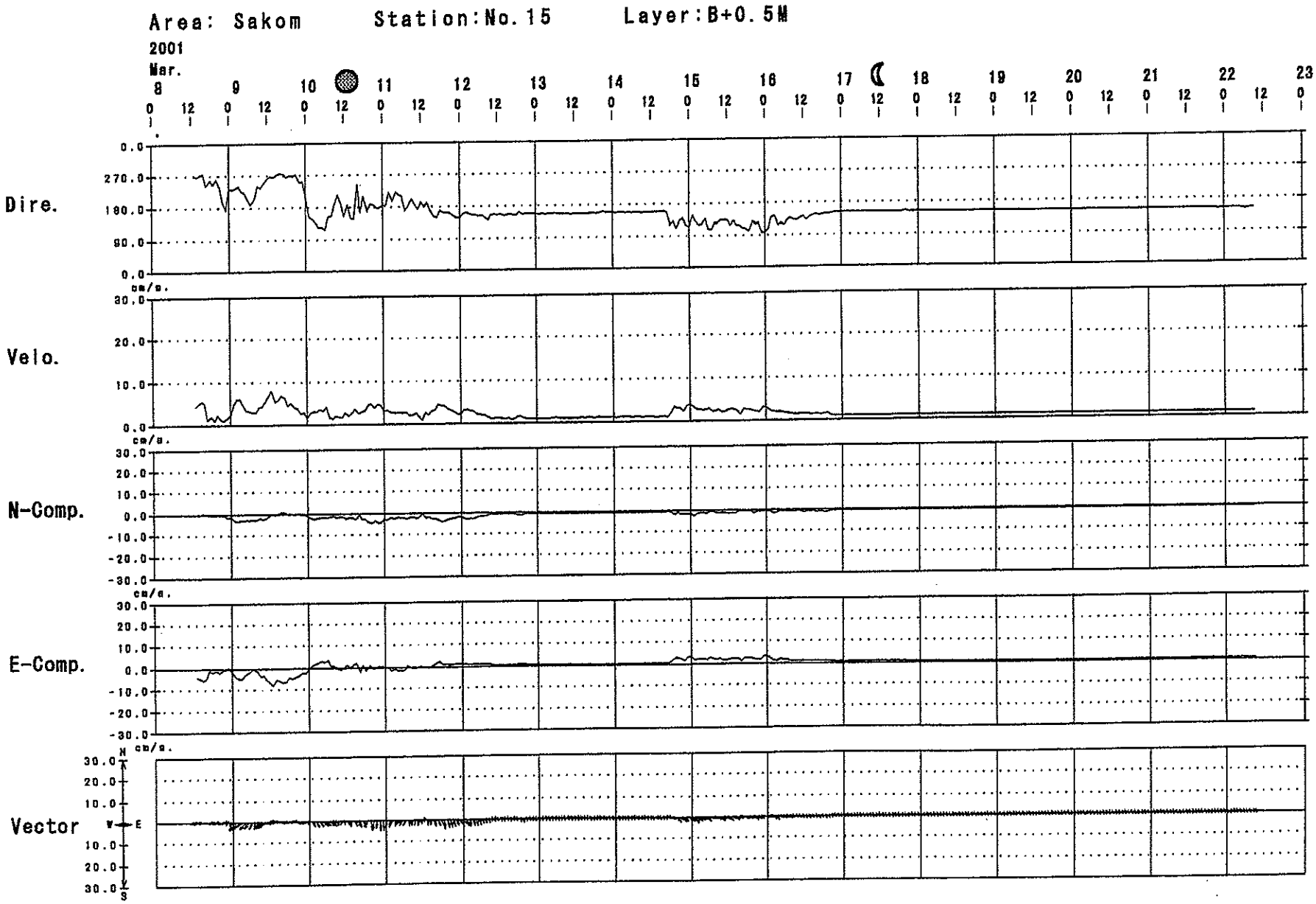


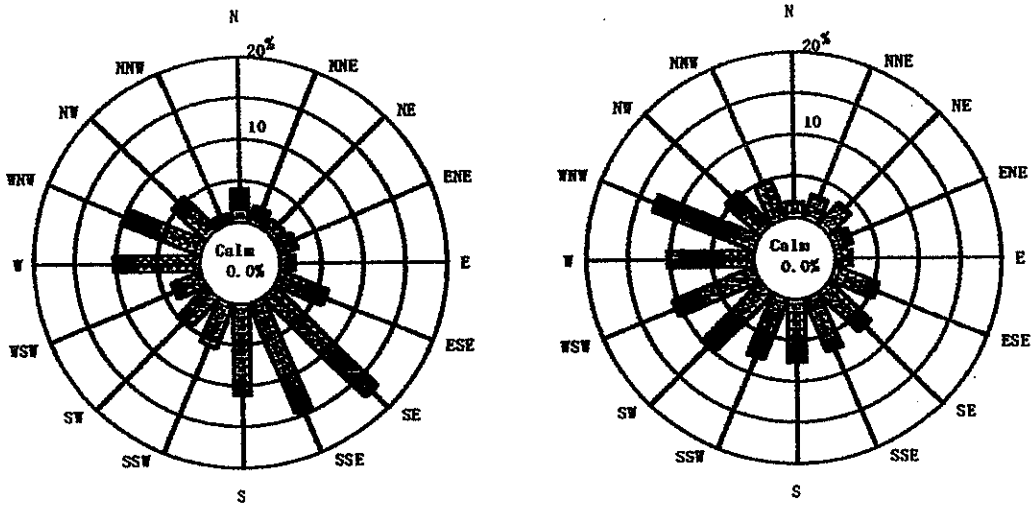
Figure 4.6.3-18 Current Diagram at Station No. 15 in Sakom

Sakom

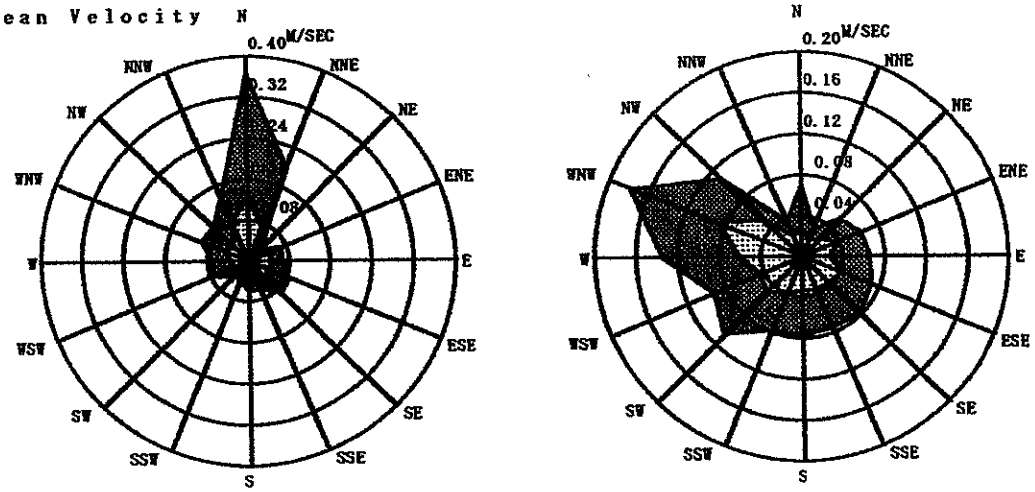
No. 6 B+0.5M
Mar. 8 2001～Mar. 22 2001

No. 8 B+0.5M
Mar. 8 2001～Mar. 22 2001

Current Rose Diagram



Max. Mean Velocity



Histogram

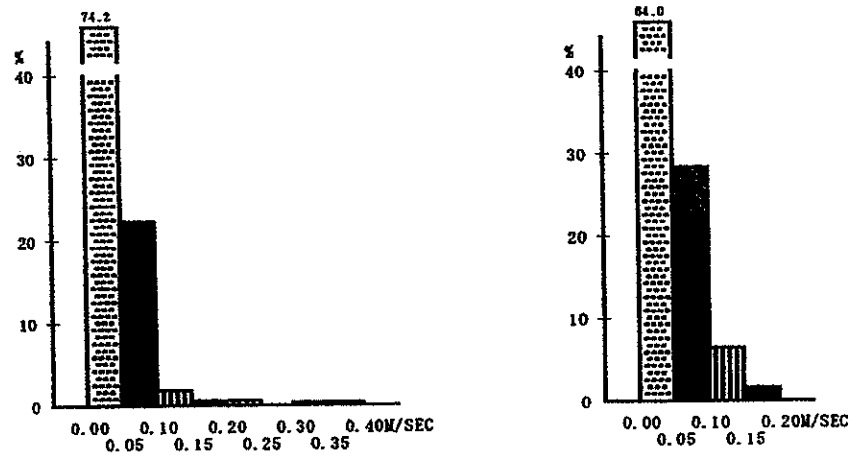
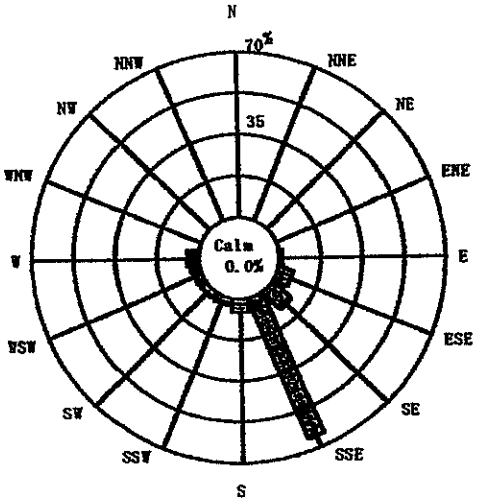


Figure 4.6.3-19 Frequency of Current at Station No. 6 and No. 8 in Sakom

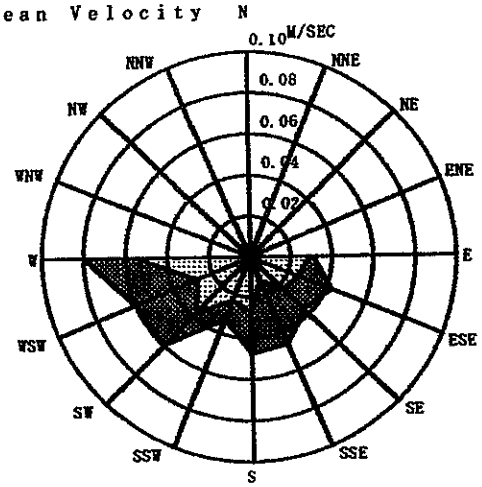
Sakom No. 15 B+0.5M

Mar. 8 2001～Mar. 22 2001

Current Rose Diagram



Max. Mean Velocity



Max. Velocity Mean Velocity

Histogram

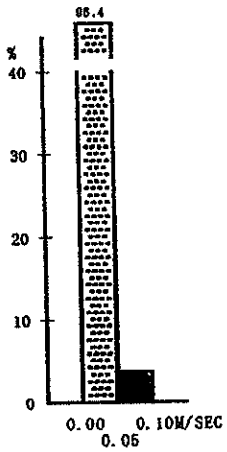


Figure 4.6.3-20 Frequency of Current at Station No. 15 in Sakom

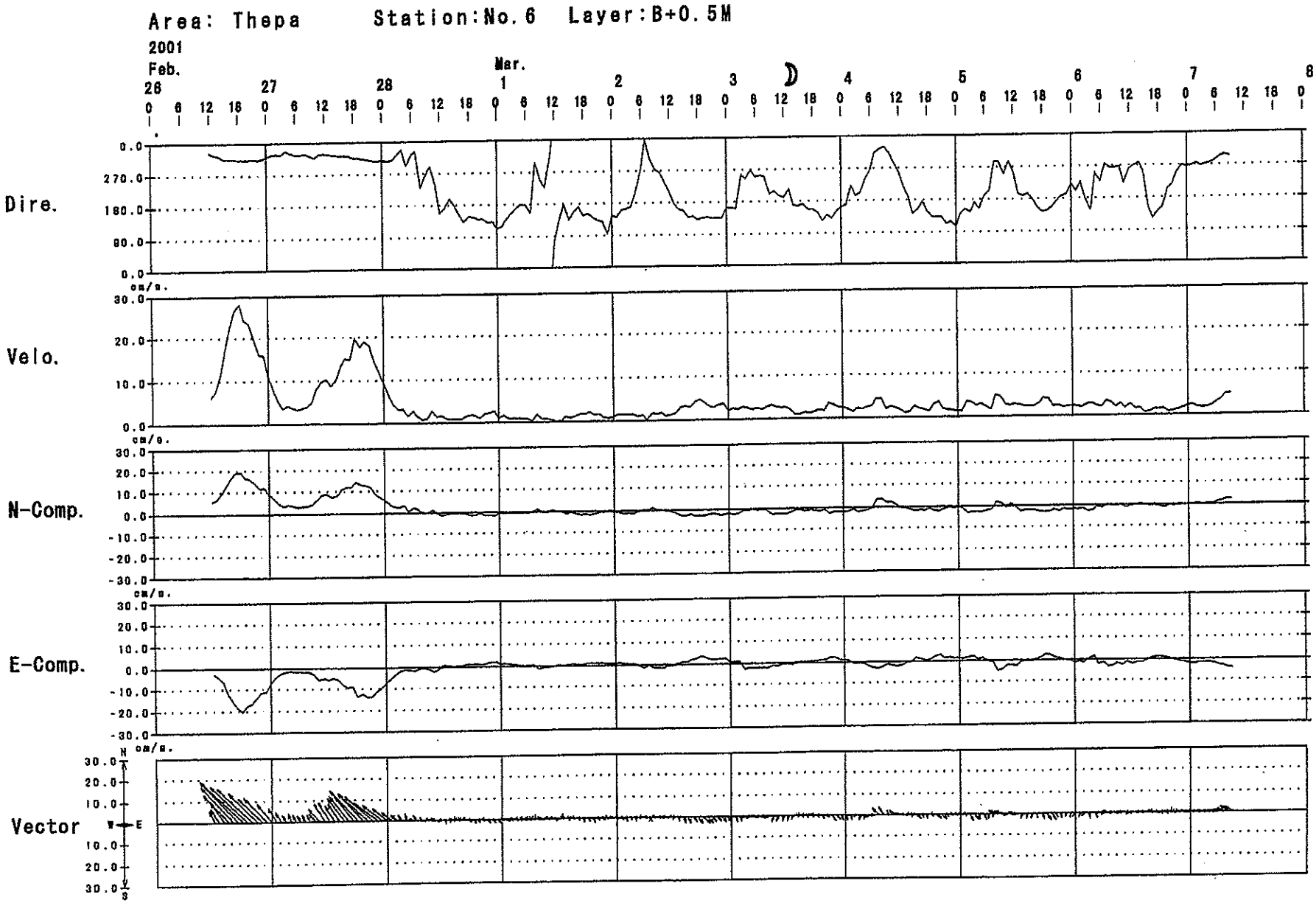


Figure 4.6.3-21 Current Diagram at Station No. 6 in Thepha

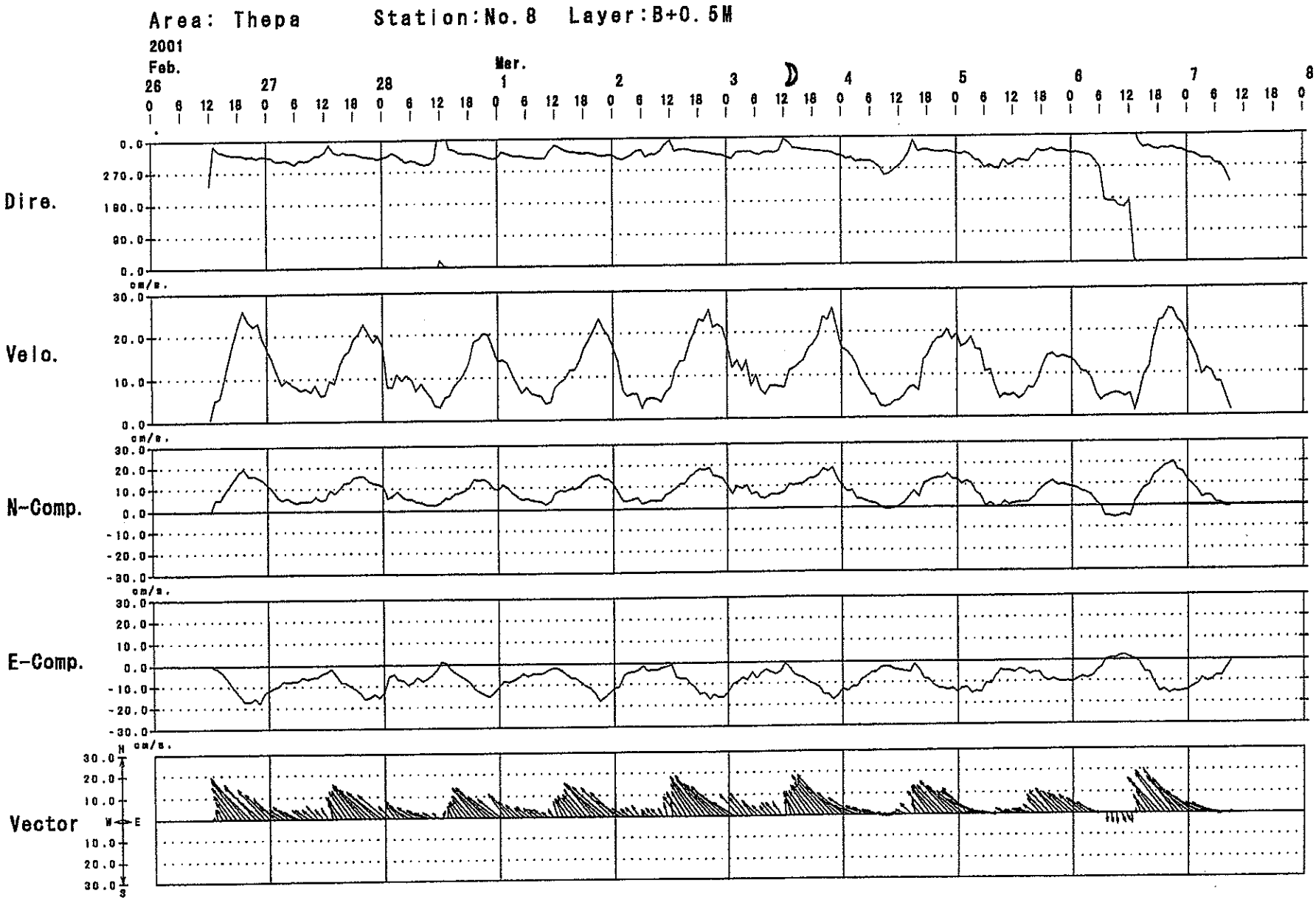


Figure 4.6.3-22 Current Diagram at Station No. 8 in Thepha

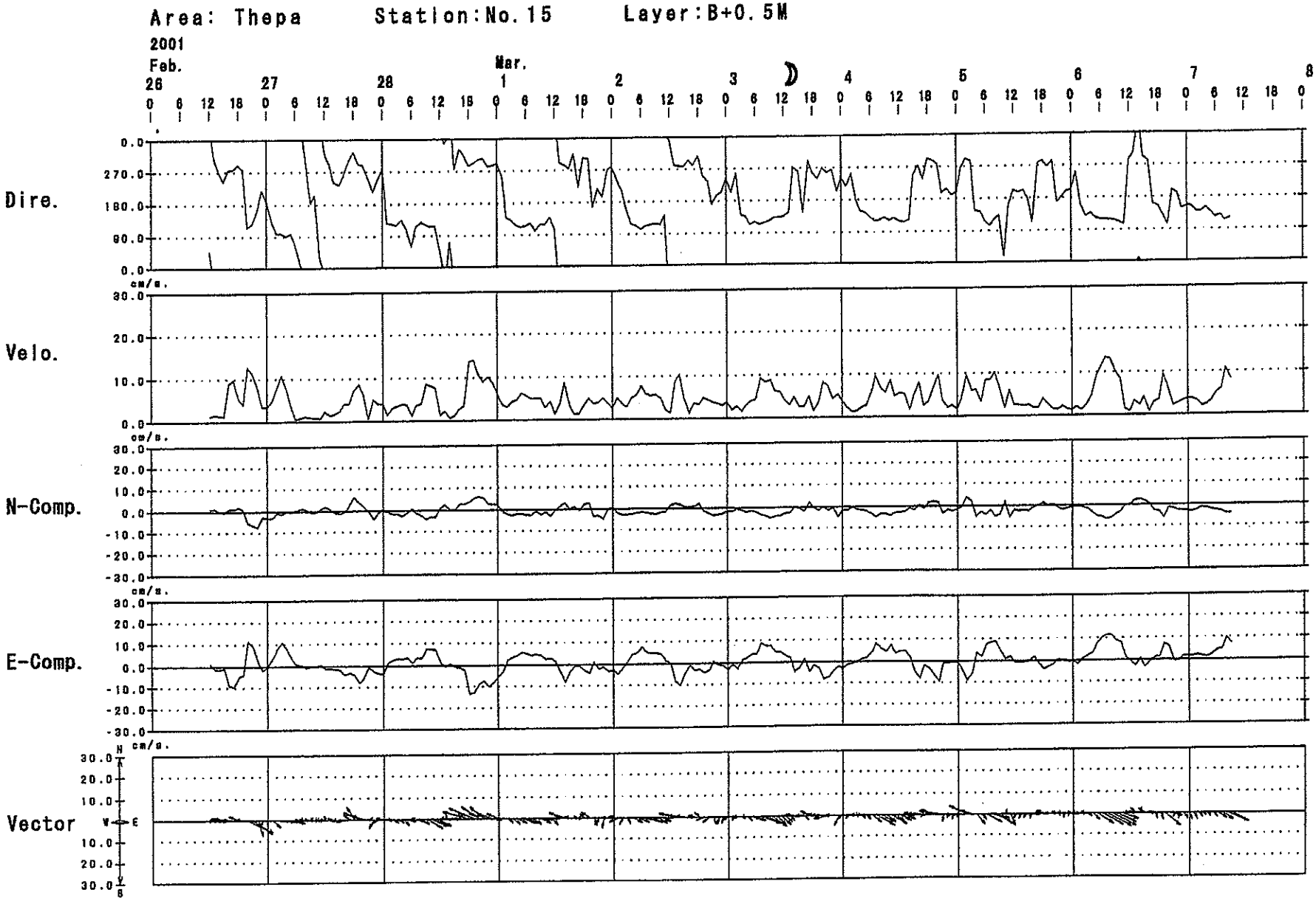


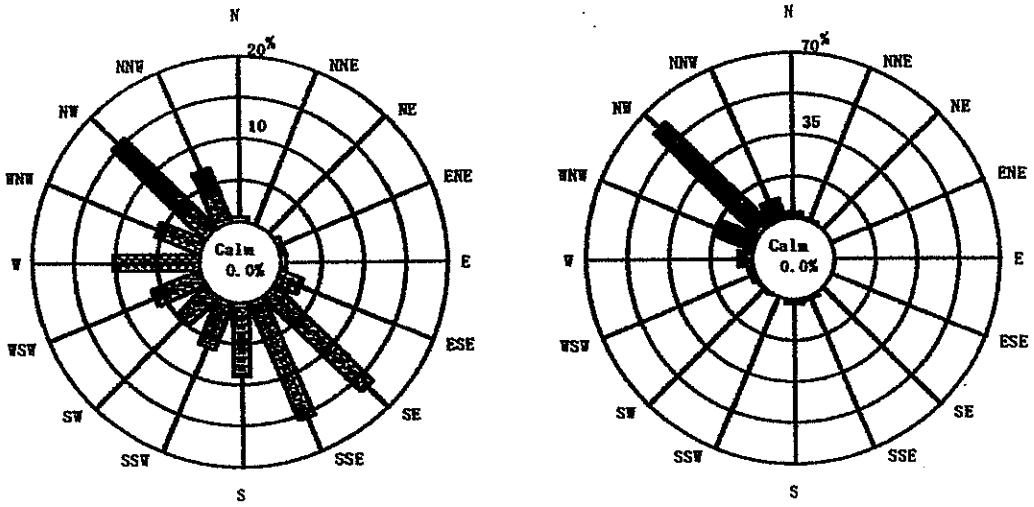
Figure 4.6.3-23 Current Diagram at Station No. 15 in Thepha

Thepa

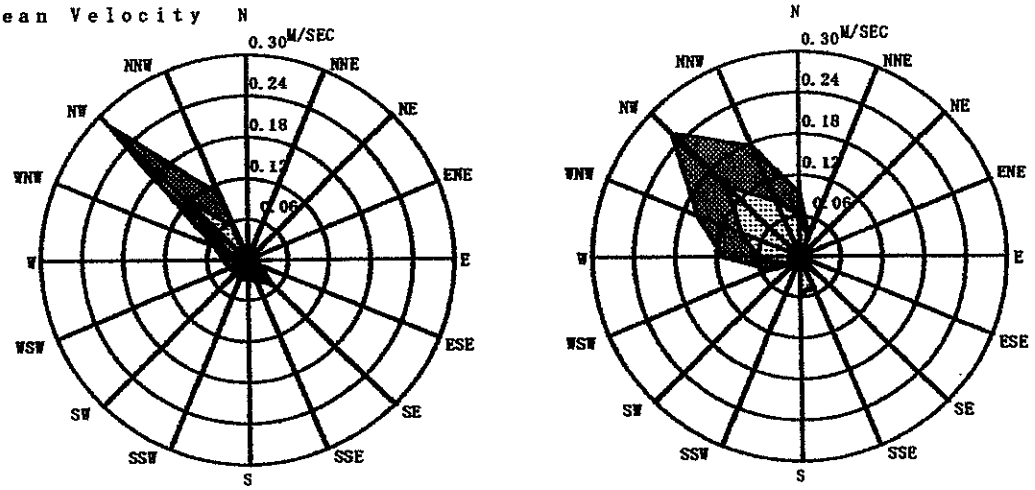
No. 6 B+0.5M
Feb. 26 2001～Mar. 7 2001

No. 8 B+0.5M
Feb. 26 2001～Mar. 7 2001

Current Rose Diagram



Max. Mean Velocity



Max. Velocity Mean Velocity

Histogram

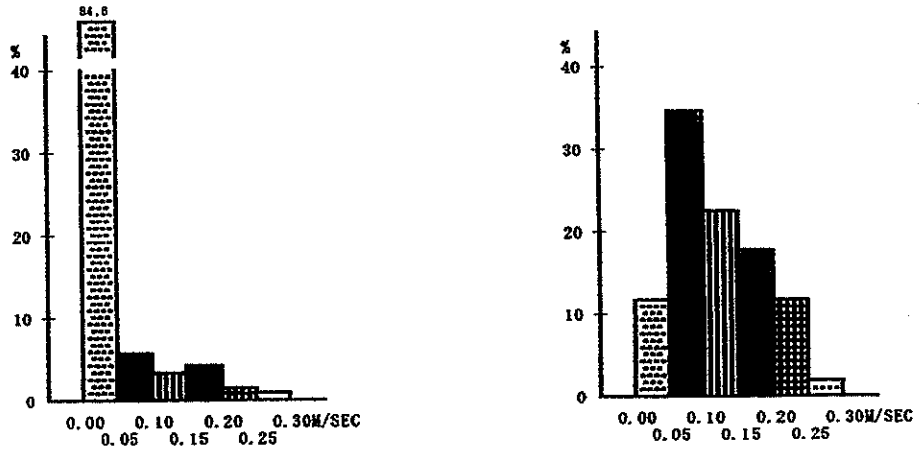
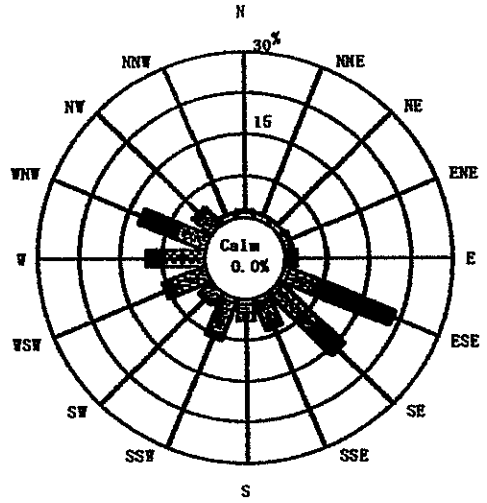


Figure 4.6.3-24 Frequency of Current at Station No. 6 and No. 8 in Thepha

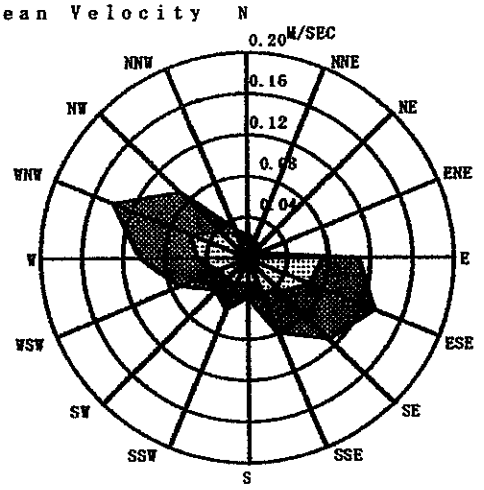
Thepa No. 15 B+0.5M

Feb. 26 2001～Mar. 7 2001

Current Rose Diagram



Max. Mean Velocity



Max. Velocity Mean Velocity

Histogram

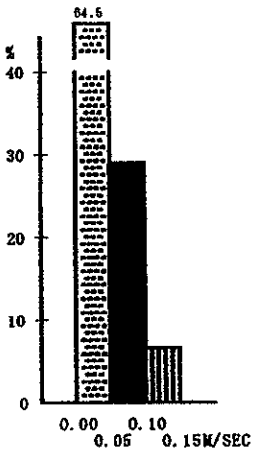


Figure 4.6.3-25 Frequency of Current at Station No. 15 in Thepha

3) Littoral Current

Results of the littoral current observation are shown in Figures 4.6.3-26 to 4.6.3-28 in Sichon, Sakom and Thepha areas, respectively.

The result of littoral current observation is summarized in Table 4.6.3-3.

Table 4.6.3-3 Summary of Littoral Current Observation during February to April, 2001

Area	Current Speed			Remarks
	Flood Tide	Ebb Tide	Rough Condition	
Sichon	15 – 30 cm/s < 10 cm/s	20 – 30 cm/s 10 – 20 cm/s	10 – 30 cm/s < 10 cm/s	offshore & right-side of jetty left-side of jetty
Sakom	< 10 cm/s < 10 cm/s	10 – 25 cm/s < 10 cm/s	15 – 25 cm/s 10 – 20 cm/s	offshore & inside of jetty right-side & left-side of jetty
Thepha	10 – 30 cm/s 5 – 10 cm/s	10 – 20 cm/s < 10 cm/s	20 – 30 cm/s 20 – 30 cm/s	offshore & inside of jetty right-side & left-side of jetty

4) Diffusion Test

The result of diffusion test by method of dye tracing in Sichon area strongly shows the advection to the northeast and east as the effect of littoral current (see Figure 4.6.3-29).

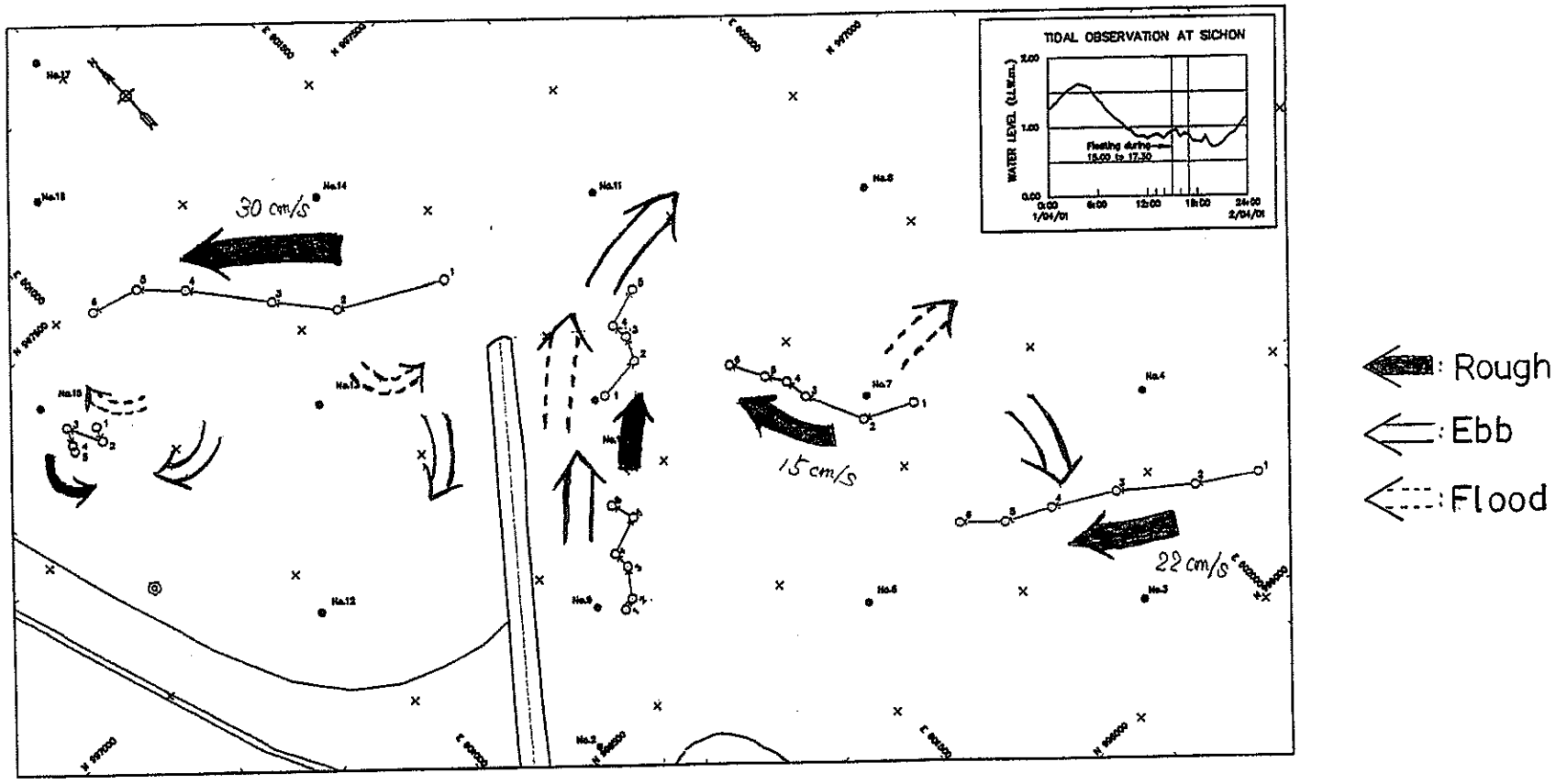


Figure 4.6.3-26 Illustration of Littoral Current Distribution in Sichon

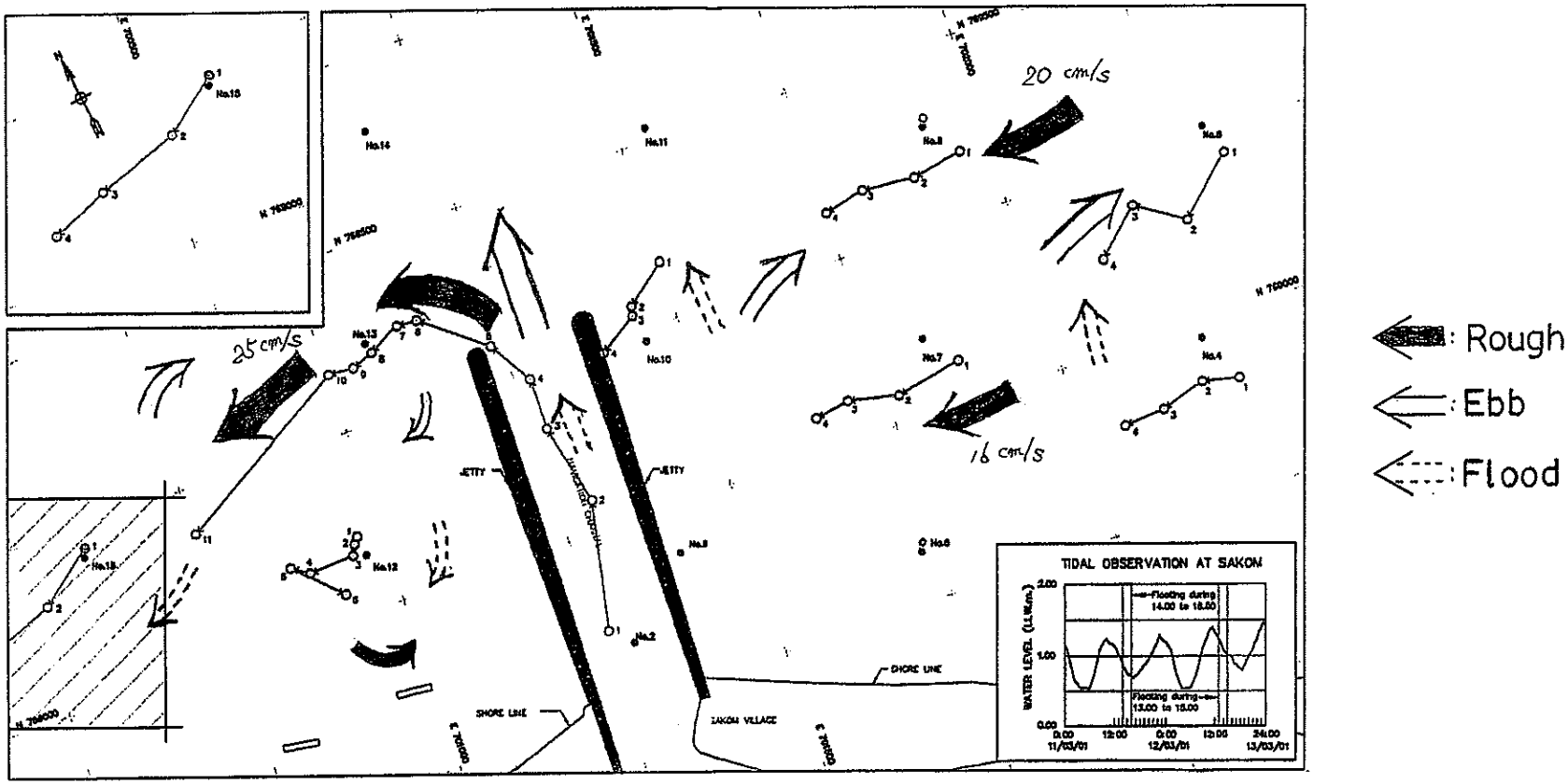


Figure 4.6.3-27 Illustration of Littoral Current Distribution in Sakom

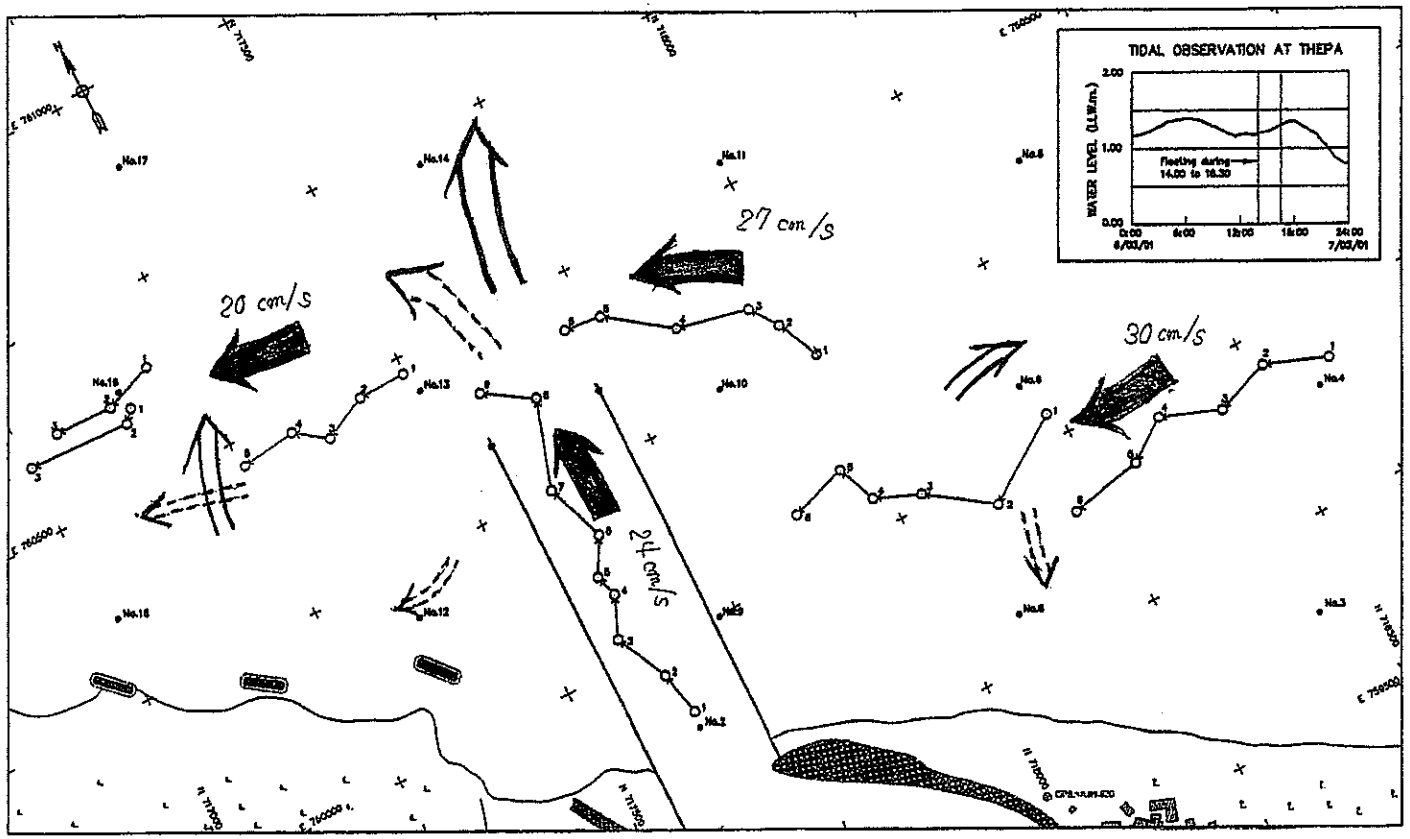
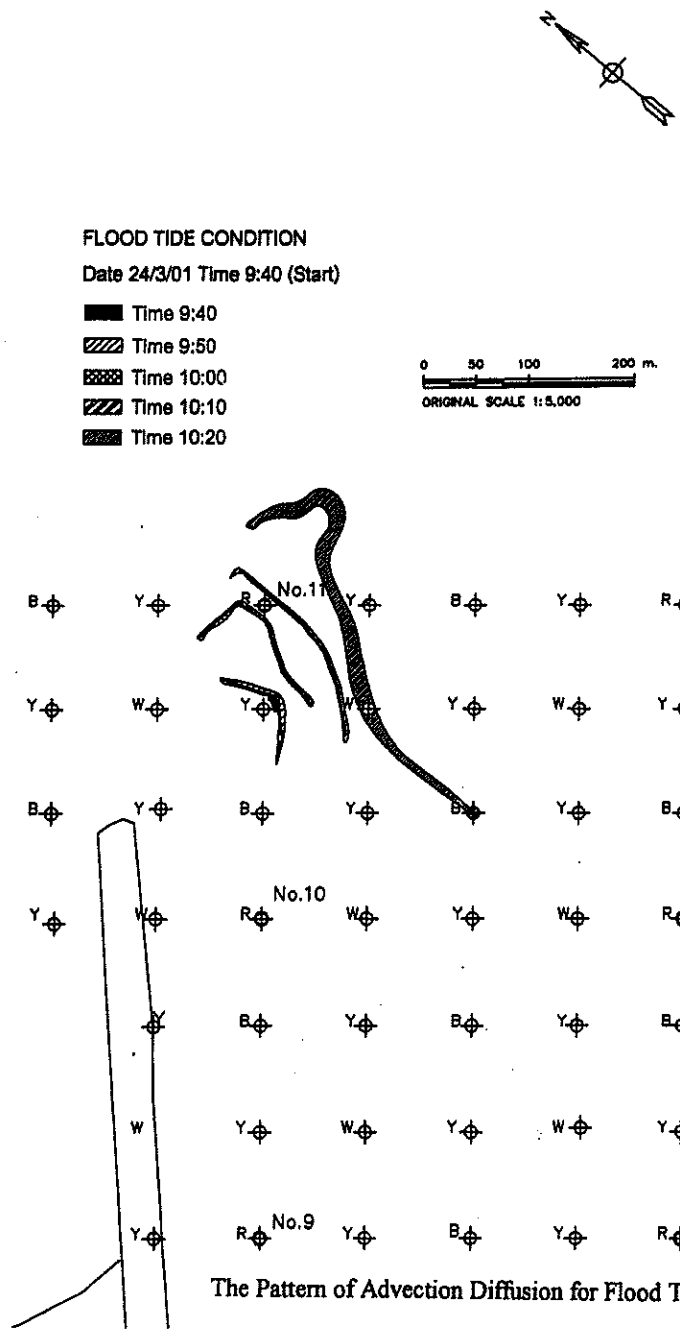
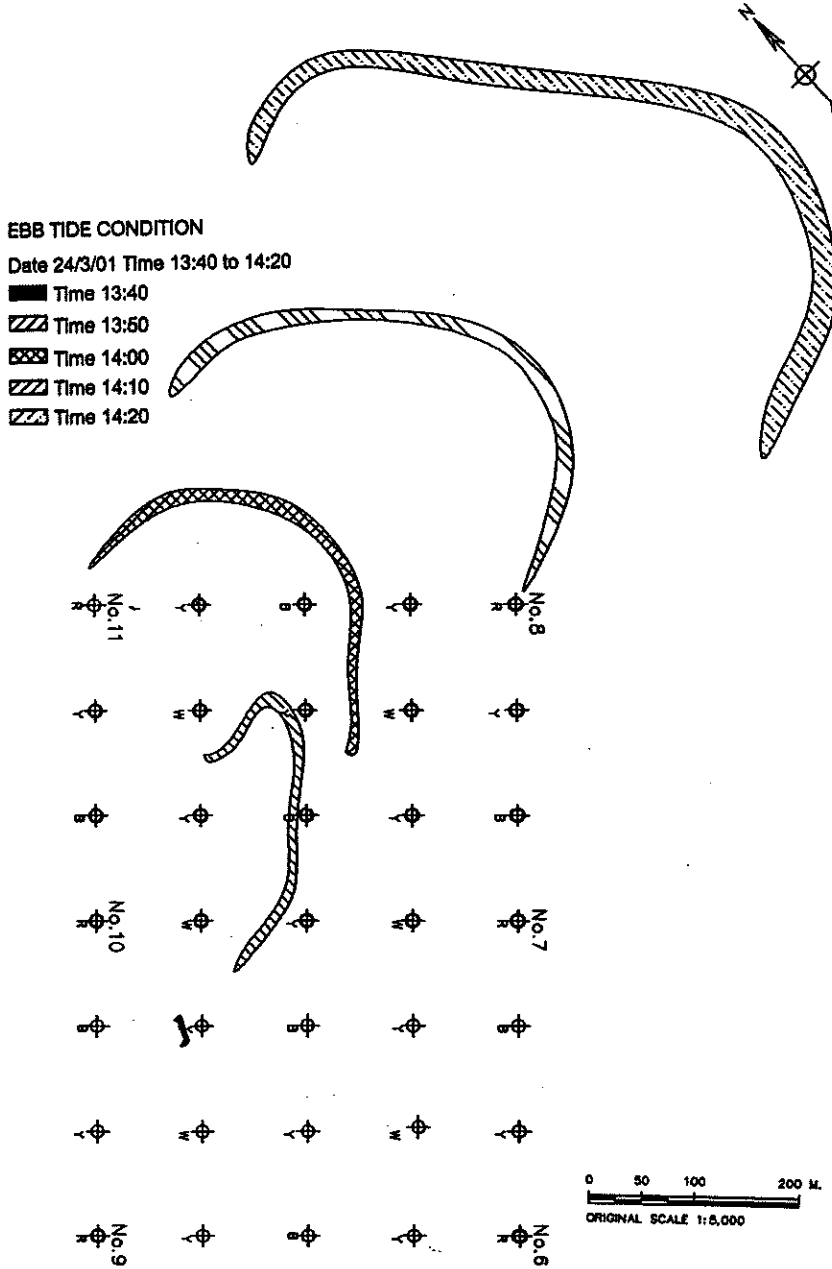


Figure 4.6.3-28 Illustration of Littoral Current Distribution in Thepha



The Pattern of Advection Diffusion for Flood Tide



The Pattern of Advection Diffusion for Ebb Tide

Figure 4.6.3-29 Diffusion Test by Method of Dye Tracing