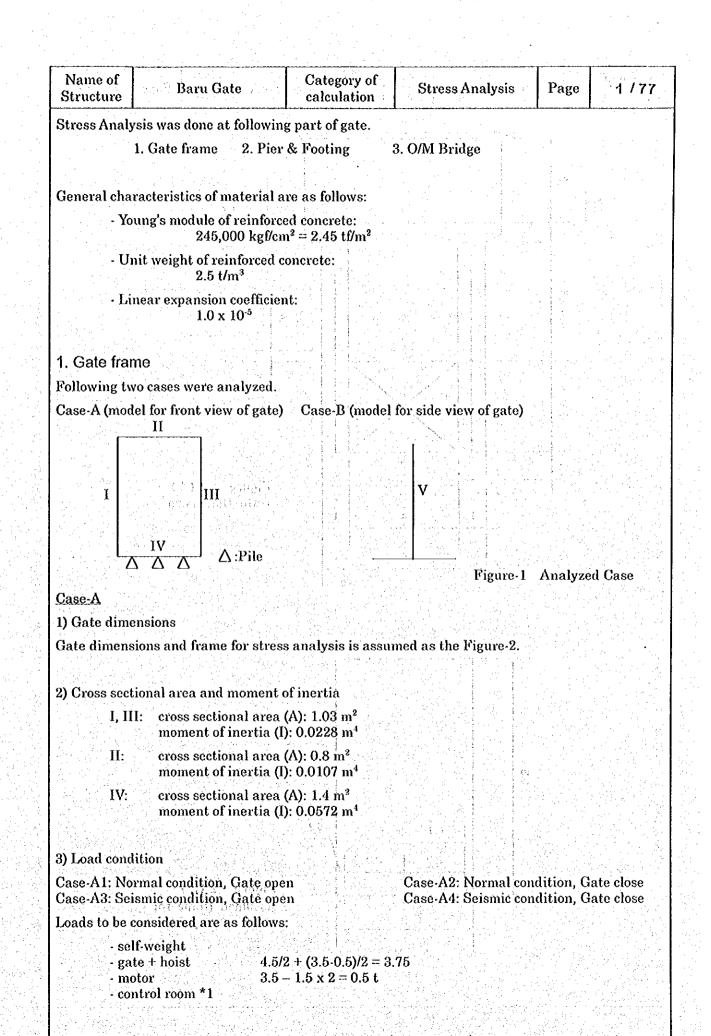
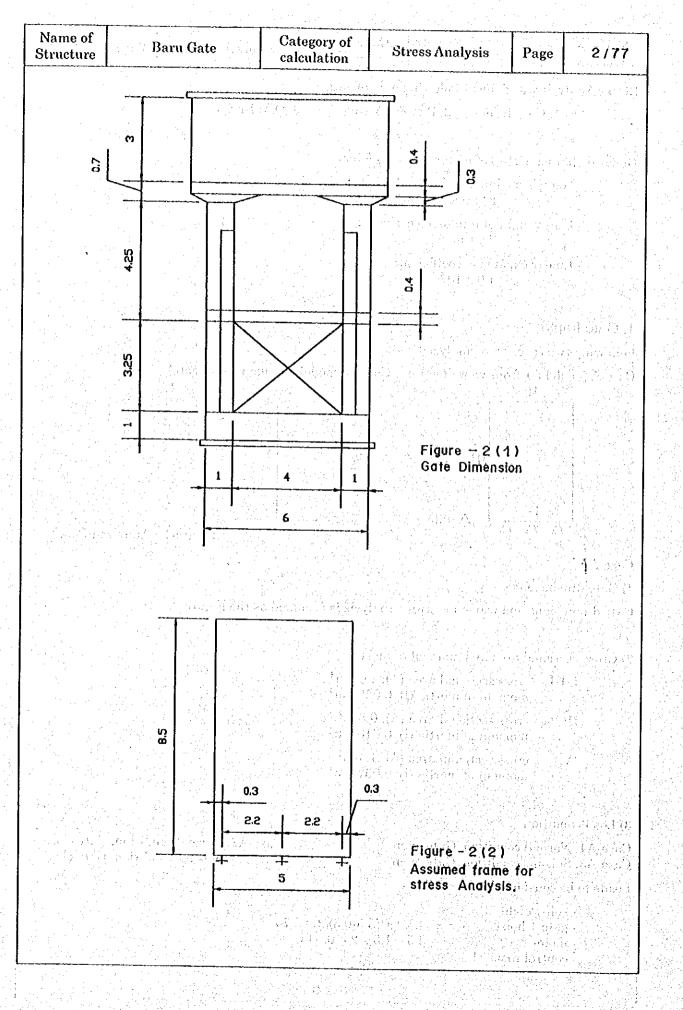
3.1 Baru Pumping Station3.1.3 Stress Analysis of Gate

(

() 0



3 - 60



Name of Structure	Baru Gate	Category of calculation	Stress Ar	alysis	Page	3/77
• ea	nbedded materials urth pressure *2 urthquake force	3 / 2 = 1.5 t	·		in de la composition de la composition de l de la composition de l	
*2:	total weight of control ro earth pressure	om: 50 t → 50 / 5	= 10 t/m			
(no	rmal condition)					
Tot		urcharge (S): 1.04, (H) 23.57 /		H: 23. H: 10.		
(ea	rthquake condition)					
Tot	al earth pressure (E):		: 36.69 t : (V) 9.173 t, '	Y = 0.95		

Load conditions are shown in Figure-3 to Figure-6.

4) Results of stress analysis

Summary of results are as follows:

(details, see attached Figures-7 to 10)

Case-B2: Normal condition, Gate close

Case-B4: Seismic condition, Gate close

	Nor	mal	Seismic		
	A1 (gate open)	A2 (gate close)	A3 (gate open)	A4 (gate close)	
Bending Moment	45.493	44.485	47.831	53.120	
Shear Stress	59.747	57.497	65.753	62.998	
Axial Stress	58.697	56.447	64.524	61.939	
Displacement	0.4105	0.4337	1.4600	1.4199	

Case-B

1) Assumed dimensions

Model for Case-B is assumed as a beam as shown in Figure-1 with the height of 8.5 m.

2) Cross sectional area and moment of inertia

cross sectional area (A): 1.03 m² moment of inertia (I): 0.3433 m⁴

3) Load condition

Case-B1: Normal condition, Gate open Case-B3: Seismic condition, Gate open

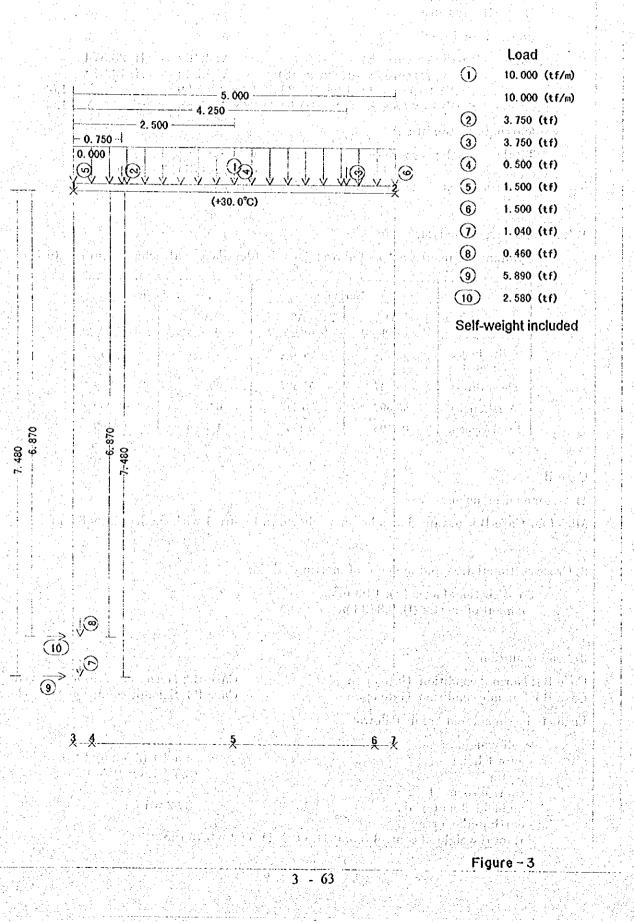
Loads to be considered are as follows:

이 가장 승규는 것은 것을 수 있는 것 같아요. 것 같아요. 가지 않는 것 같아요. 가지 않는 것 같아요.	
self-weight	
gate + hoist	$4.5/2 + (3.5 \cdot 0.5)/2 = 3.75$
motor	(3.5 - 1.5 x 2)/2 = 0.25 t
control room *1	
embedded materials	3/2 = 1.5 t
earthquake force	
1 · · · 1 · · · · · · · · · · · · · · ·	

*1: total weight of control room: $11.5 t \rightarrow 11.5 / 2 = 5.75 t/m$

baru-1. 0-normal

Case 1 : Baru-nomal-open-1.0



the starts

4/77

ĆÌ

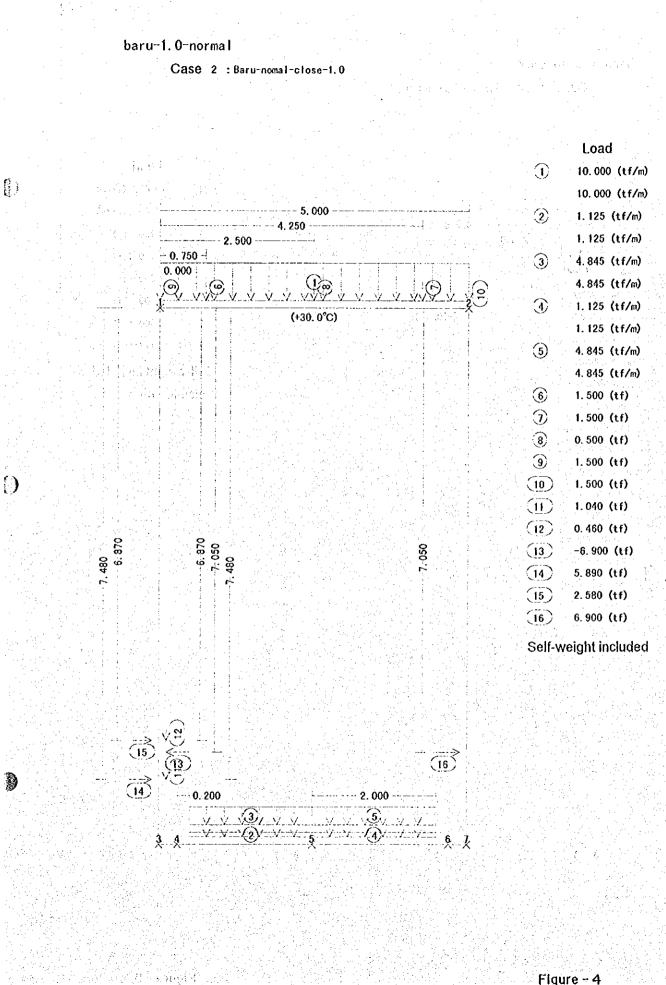


Figure - 4

3 - 64

5/77

baru-1.0-seismic

• • • •

Э

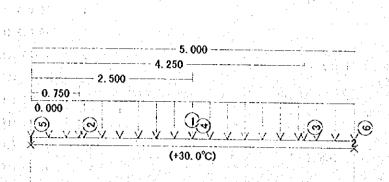
3.4

5

3 - 65

7::550

Case 1 : Baru-seismic-open-1.0



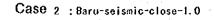
Load 10.000 (tf/m) 10.000 (tf/m) 0 3.750 (tf) 3 3.750 (tf) 4 0.500 (tf) (5) 1.500 (tf) 6 1.500 (tf) 9.173 (tf) Self-weight included Seismic Force KH = 0 11

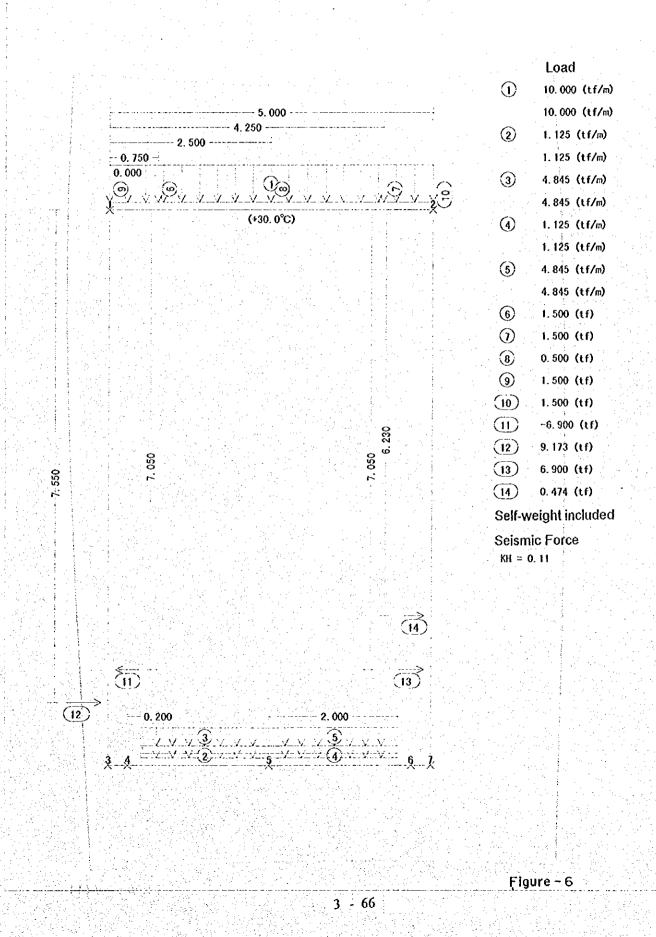
6/77

<u>6</u> *l*

7/77

baru-1.0-seismic

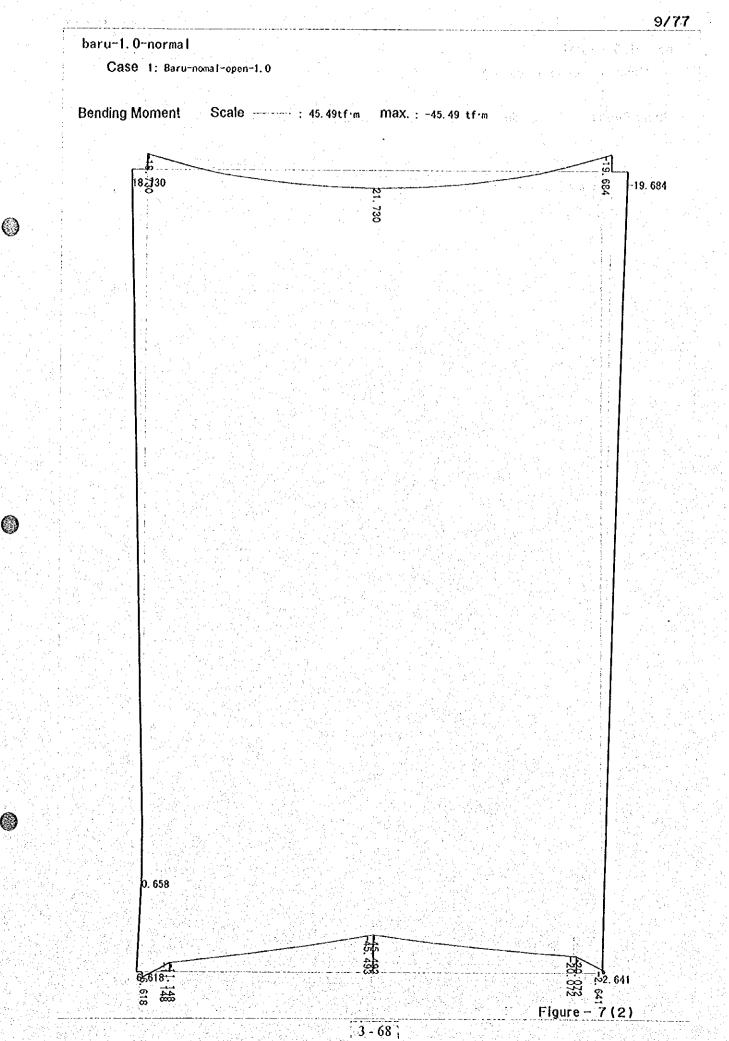




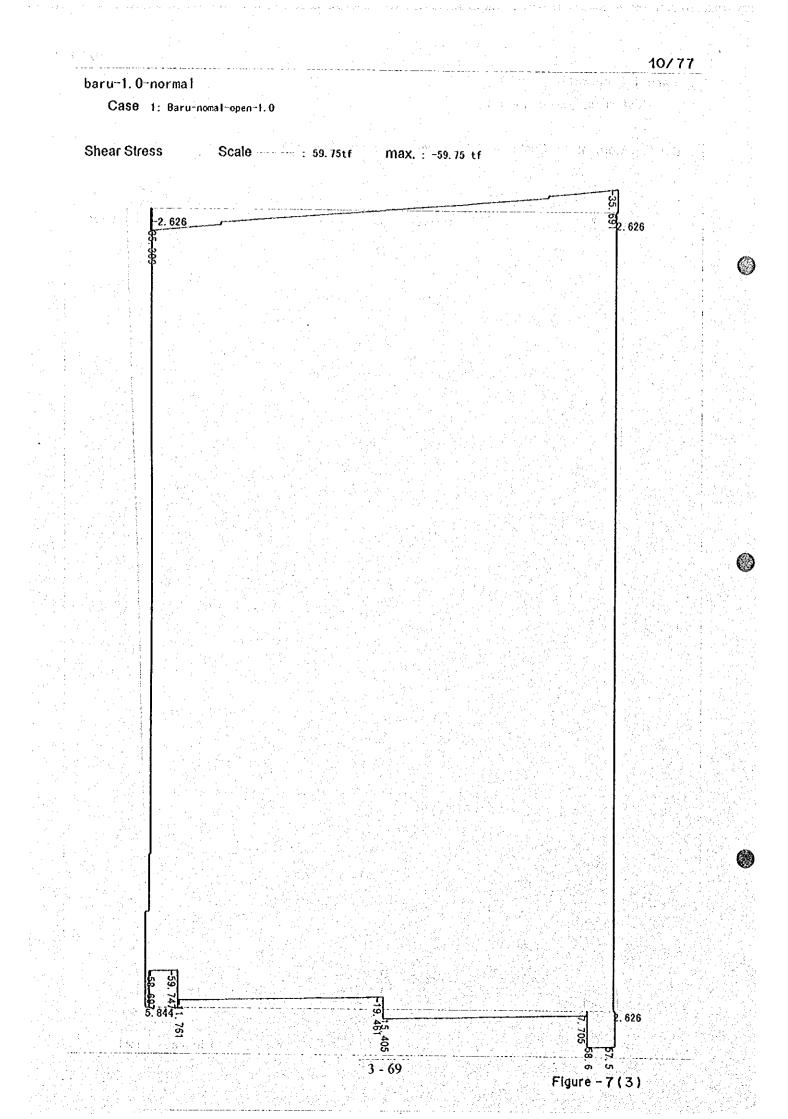
baru-1.0-normal

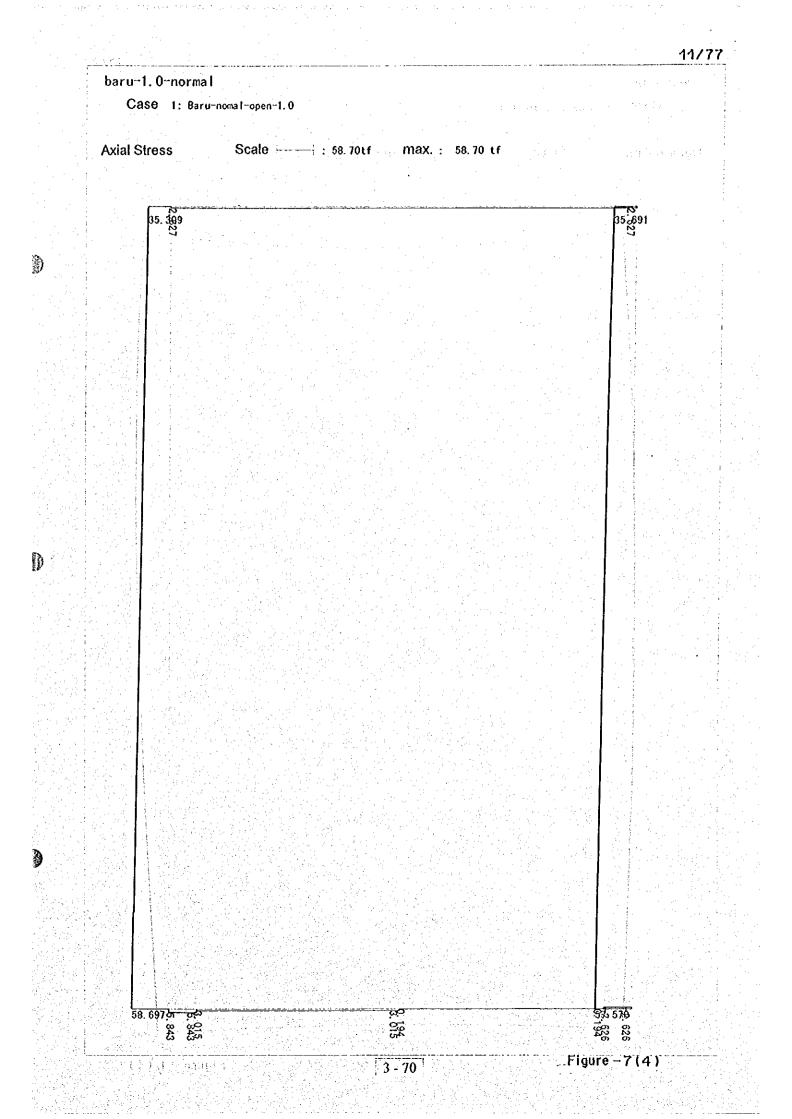
u-1.0-normal Case I: Baru-nomal-coen-1.0

Case	1: Baru-nomal-open-1.0				
Deformatio	n Scala	. 0 424	may		
Delomano		- : 0. 434cm	max. : 0.	410 cm	
an de la composition de la composition Composition de la composition de la comp				antan ang pananan Ang pananang panananan	
n de la dela	·····	an a			
		an an an Arrange. An Arrange an Ar			
1997年1月1日(1997年) 1997年1月1日(1997年)					
			na an a		
			7		1. というたらし (A) それの人名 (A) (名)
				en estador astronom Anticipation	
	. Saul J. Marallin, K.				Figure - 7(1)
가지, 10 1993년 19 1993년 1971년 - 1971년 1971년 1971년 - 1971년		3	- 67		

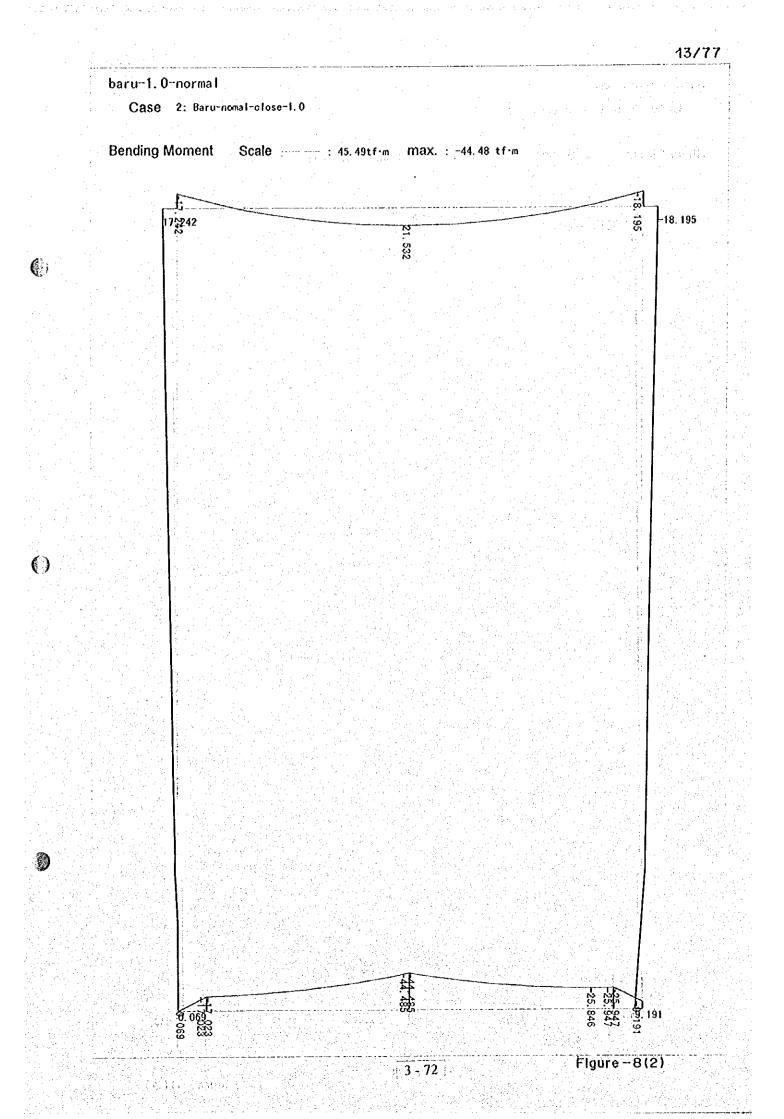


÷



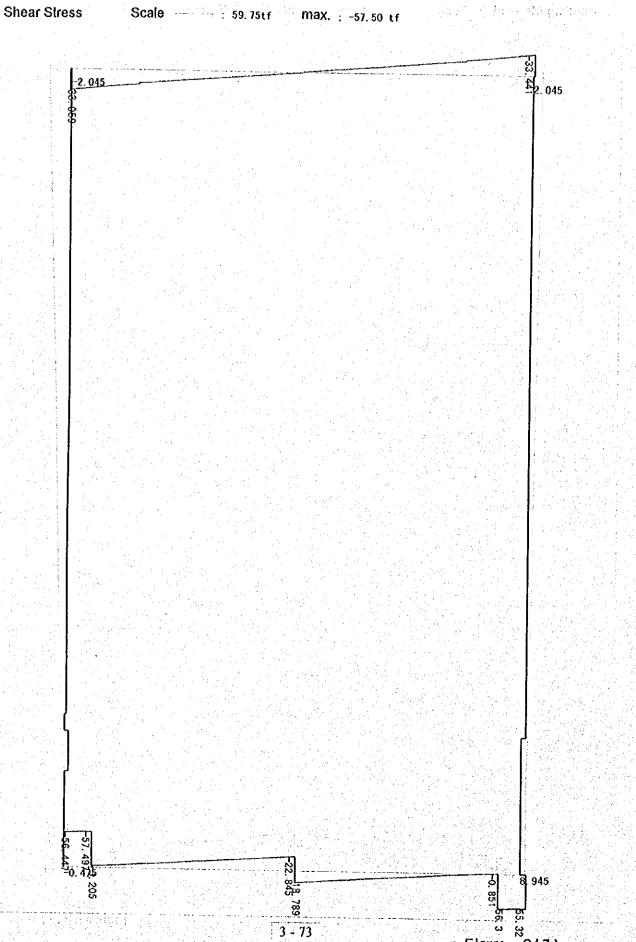


12/77 baru-1.0-normal Case Baru-nomal-close-1.0 and the set of ta Kauta Scale ----- : 0. 434cm Max. : 0. 434 cm Deformation 18.064 813.111 az 8



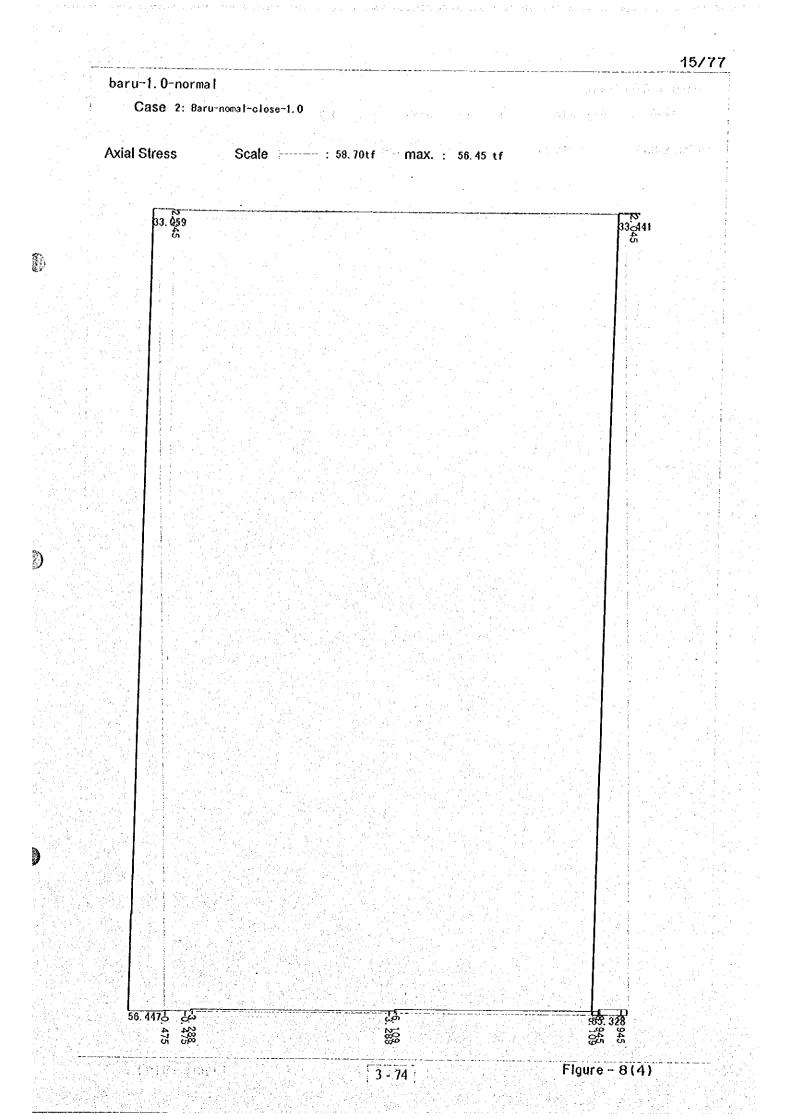


Case 2: Baru-nomal-close-1.0



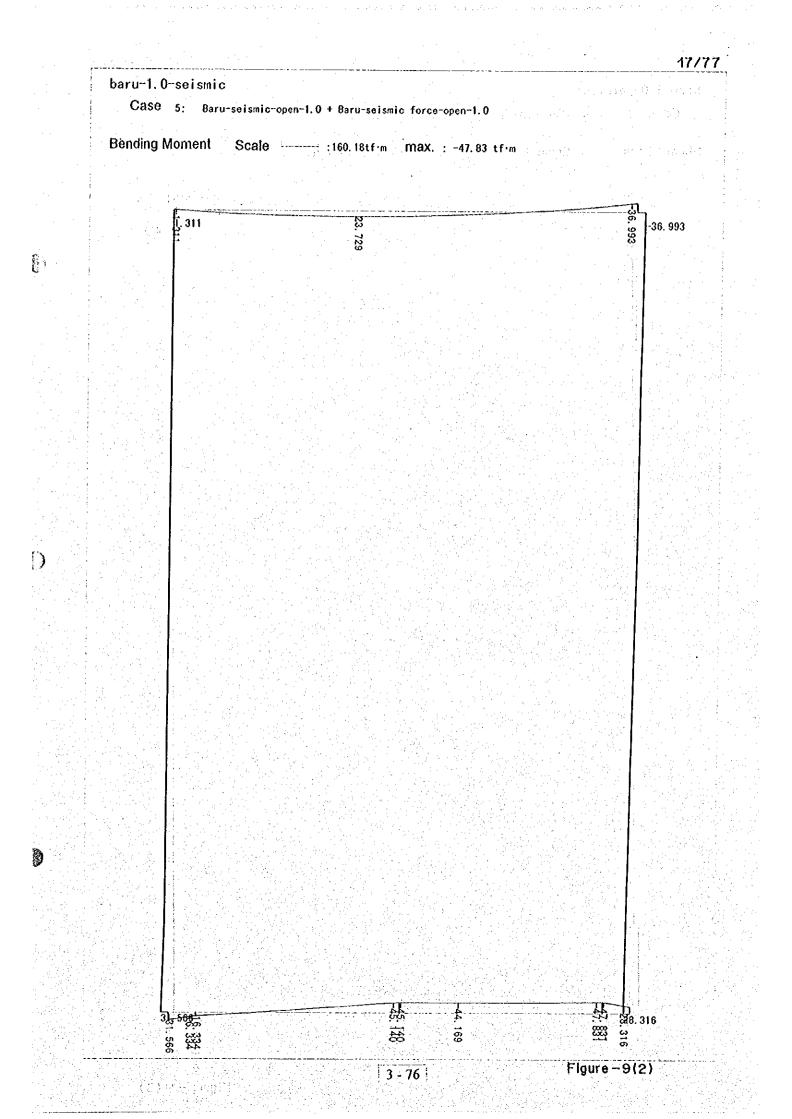
14/77

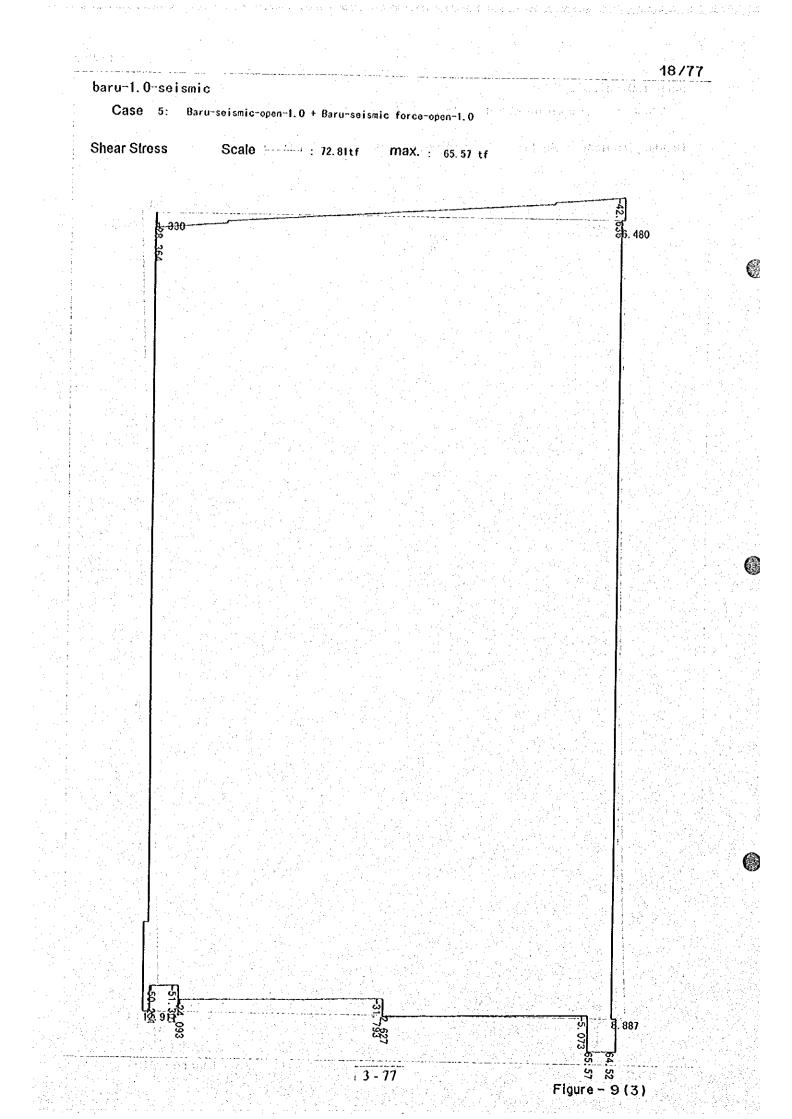
 \bigcirc



baru-1.0-seism	nic		······	 	16/77	
	aru-səismic-open-1.0 + Ba	ru-saismia for	Caronan-1 A			
	· · · · · · · · · · · · · · · · · · ·		and the second second second		. *	
Deformation	Scale : : 7.:	266cm max	• : 1.460 cm	n in seite die Die seite die s	er An er er er	
					•	. •
		<u> </u>	<u></u>			
						6
					e a constante Secondaria	
			fit en an an traca a la fit An traca a la fit an traca a la fit			
			an an Cheannaigh ann an Cheannaichte ann an Airte			
						(
						-
					an a	
			an a			

 $\{Q_i\}_{i=1}^{n}$





	·····	· ·	· · ·		•	197
baru-1.0-sei	smic		· · · · ·		· · ·	
Case 5:	Baru-seismic-open-1.0	+ Baru-seis	mic force-of	oen-1, 0	na an a	
Axial Stress	Scale	64 52tf	max.	64 52 tf		
				01.02 (1	ta di basi A	
			•			
28.364 8						12.636
				, en grad		
				at se su ptille Gran an an an		
				e de Alexandre de la composición Alexandre de la composición		
	이 이상은 48 원호의 것을 했다. 1997년 - 1997년 - 1997년 1997년 - 1997년 -					
		en di setto di setto di Li setto este				

٢

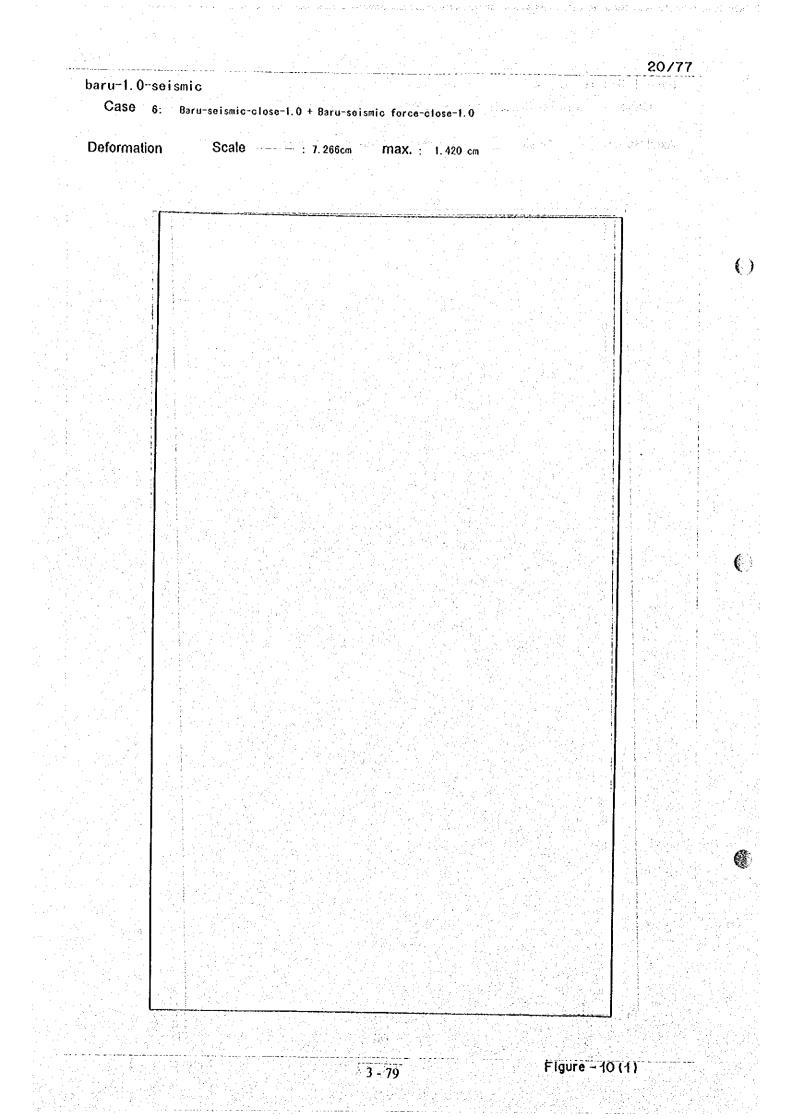
8)

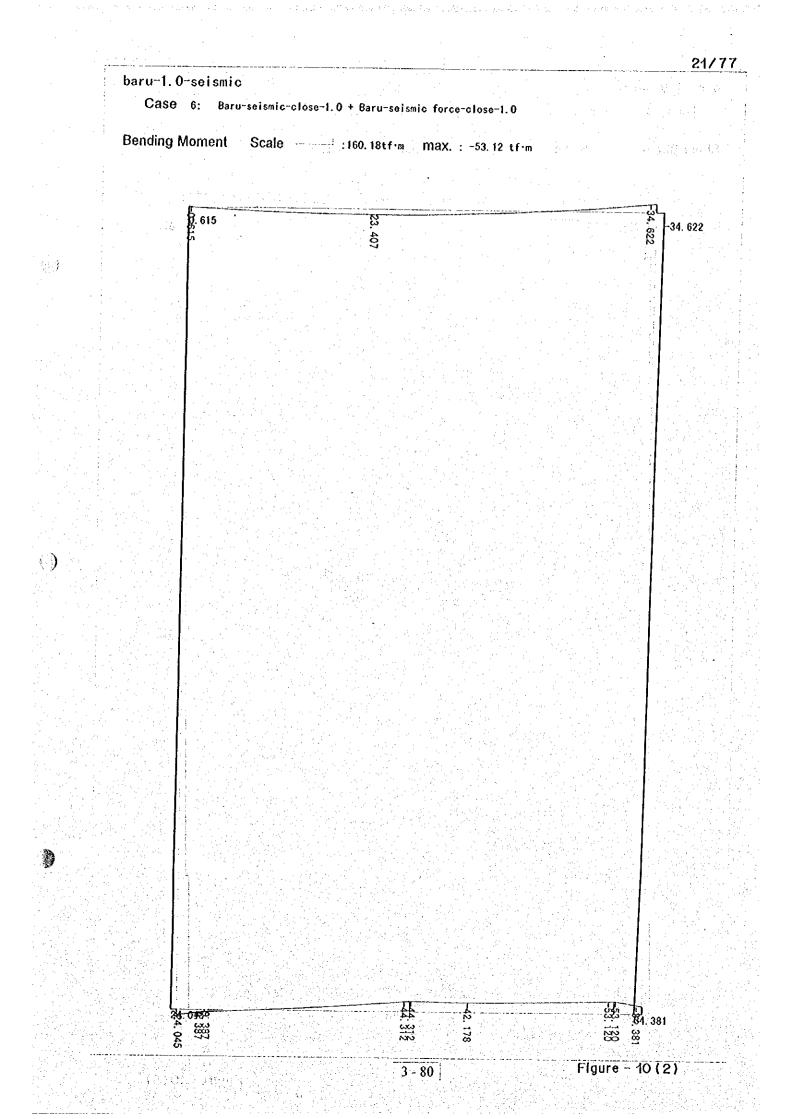
0

50. 251 50 9 50 1 57 1

فہ 5227 ن<u>ج</u>ی 8 Flgure - 9 (4)

5. 58 3 - 78

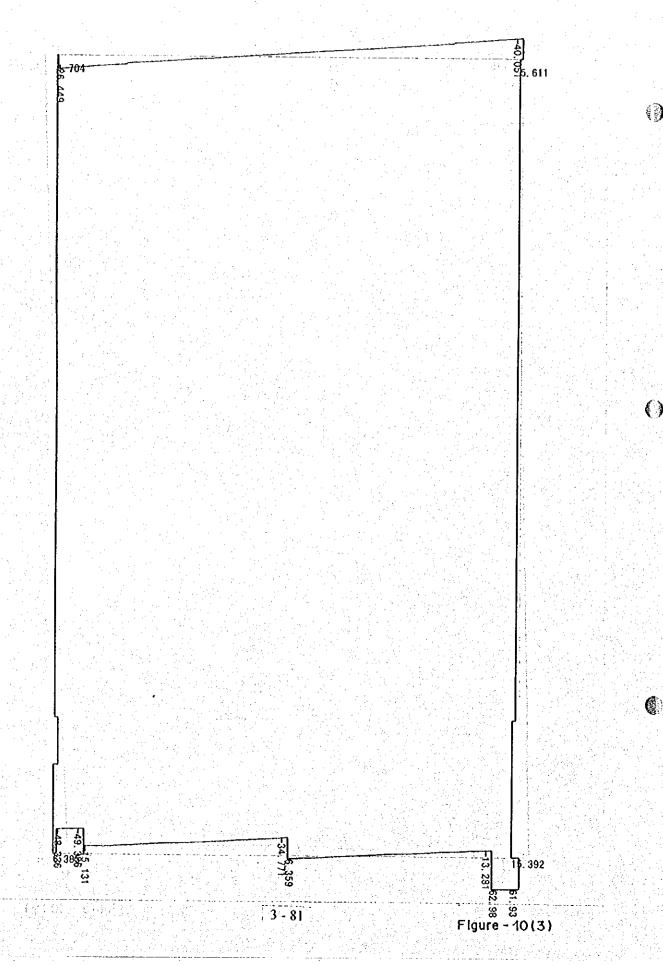




Case 6: Baru-seismic-close-1.0 + Baru-seismic force-close-1.0

Shear Stress

22/77



				•	23/77
baru-1.0-seismic Case 6: Baru-seismic-c	·	smic force-close-1	.0		
Axial Stress Scale		max. : 61.94	tf ^{orden tenens}	n 1919 - Erster	
		•	*****		
26-] 49 2				· · · · 41	0.051

зĠ 1.0 . 1

Apre 19 1.317

ंग कहती 11122.6 n de la color, d 1.11 Sec. 1 1.1 N 1996 Acald de d

essyf beber 12 的现在分词是不可以

3 - 82

a satisfies a short of

ioi u

001 dy

Ü

()

(1,2,2,3,3,4)4.

ुः

11 1 1017. 939 1208 1 gini. Figure - 10(4)

	ς.		

Name o Structur	I Kom	Gate	Category of calculation	Stress Ana	lysis I	Page	24/77
÷]	Load conditions	are shown in	Figure-11 to Fi	gure-14.			
					e estas Alterativas		
l) Result	s of stress analy	ysis				÷ .	an an taona Baratan taon 19
	Summary of res	sults are as fol	llows (details, see atta	achod Figu	voe. 15	to 18)
	· · · · · · · · · · · · · · · · · · ·			uctano, oce atta	aoneu Figu	169-10	10 10)
					and the second second second		
		No	rmal	Seis	smic		
		No B1 (gate open)	rmal B3 (gate close)	B2	B4	se)	
	Bending Moment	B1	B3				
		B1 (gate open)	B3 (gate close)	B2 (gate open)	B4 (gate clos		
	Moment	B1 (gate open) 31.535	B3 (gate close) 43.648	B2 (gate open) 38.750	B4 (gate clos 57.300		

2. Pier & Footing (Channel Section)

1) Dimensions of Pier and Footing.

Assumed dimensions for analysis are shown in Figure-19.

2) Cross sectional area and moment of inertia

cross sectional area (A): 2.4 m^2 moment of inertia (I): 0.2 m^4

3) Load condition

Case-1: Normal condition, with Water Case-3: Seismic condition, with Water Case-2: Normal condition, without Water Case-4: Seismic condition, without Water

Loads to be considered are as follows:

- self-weight

- water weight and water pressure
- earth pressure
- weight of O/M bridge $(3 \times 5 \times 0.4 \times 2.5 + 3 \times 5 \times 1) / 2 = 15 t$
- earthquake force

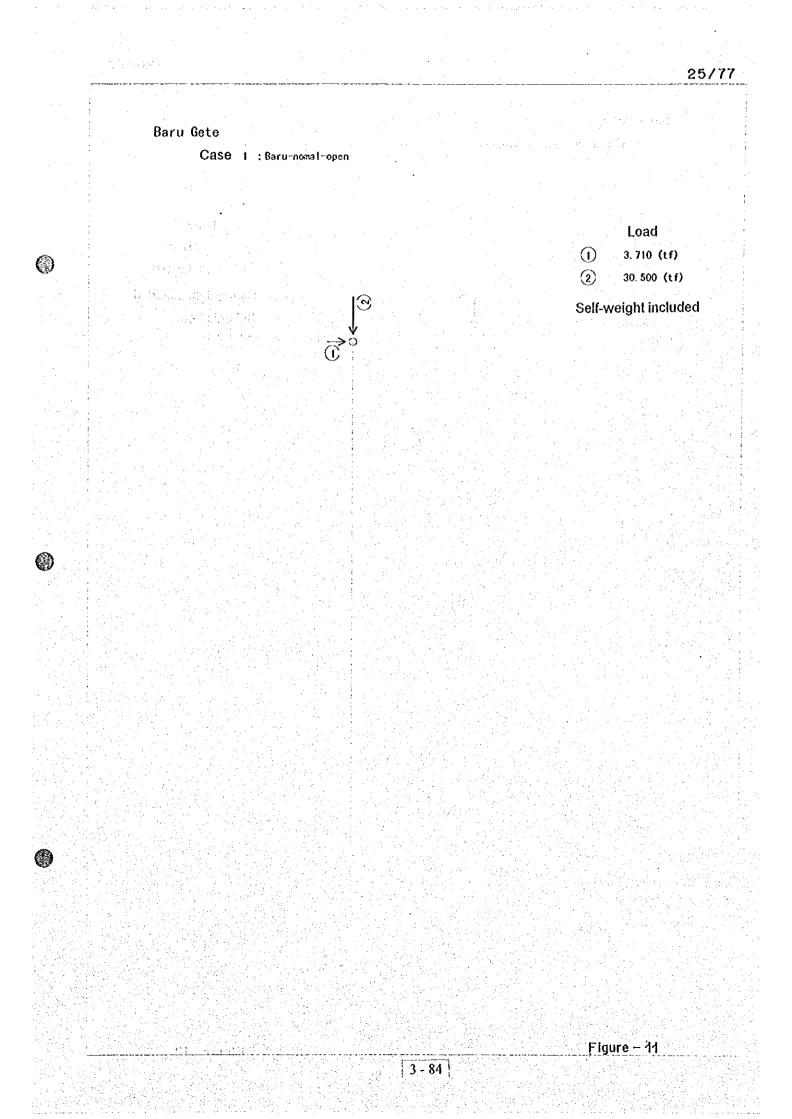
Load conditions are shown in Figure 20 to Figure 23.

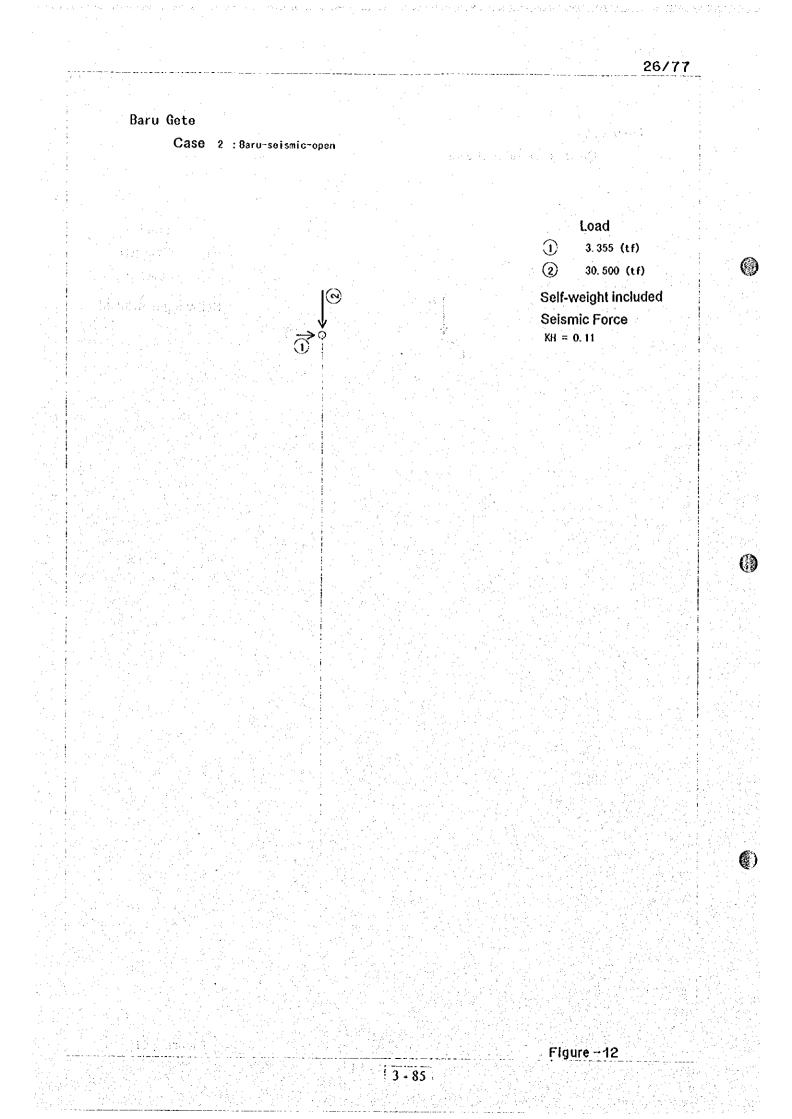
4) Results of stress analysis

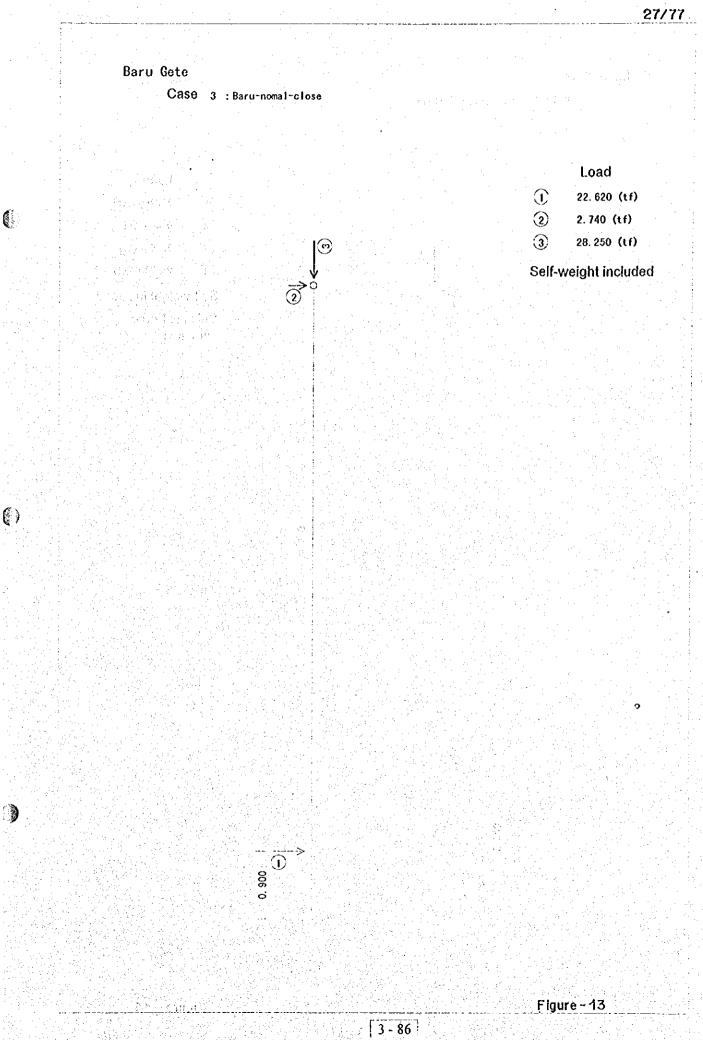
Summary of results are as follows:

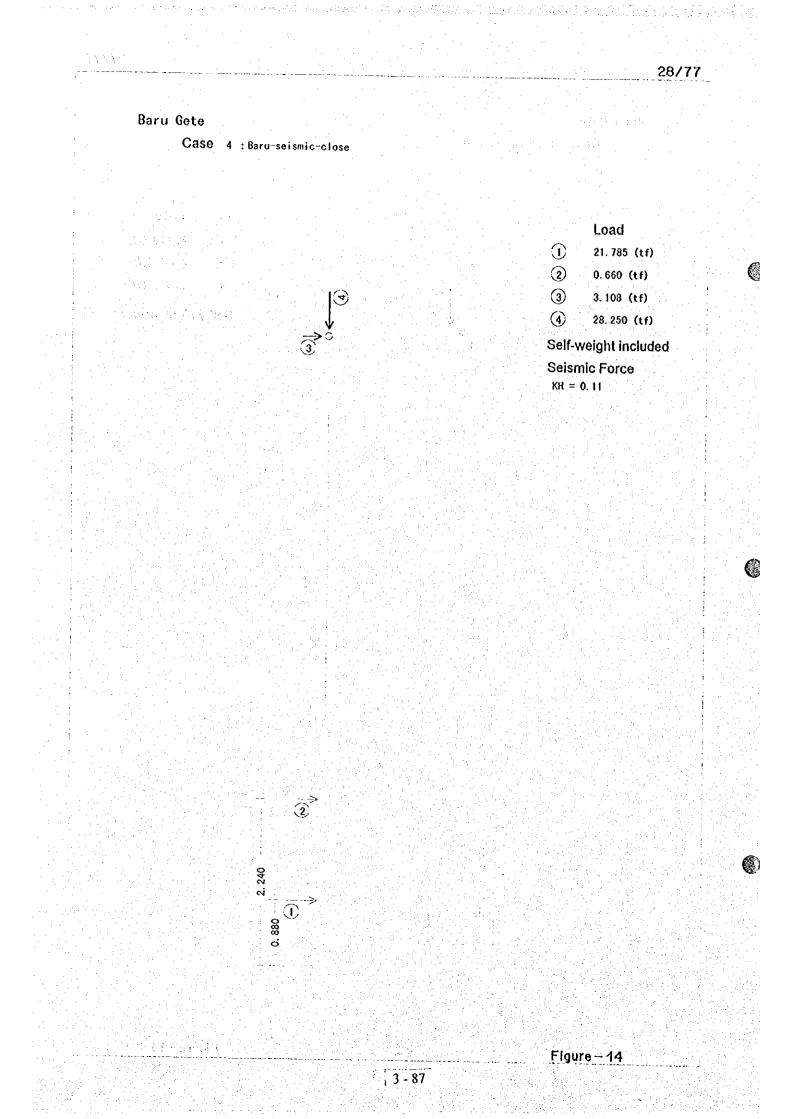
(details see attached Figure-24 to 27)

	Nor	rmal	Seismic		
	1 (w. water)	2 (w/o water)	3 (w. water)	4 (w/o water)	
Bending Moment	38.303	31.537	38.806	31.491	
Shear Stress	43.147	44.095	41.352	42.300	
Axial Stress	39.295	42.295	37.500	40.500	
Displacement	0.2077	0.1618	0.3309	0.2991	









					20/77
· · · · · · · · · · · · · · · · · · ·			·		29/77
Baru Gete	· .				g a general de la composition de la comp
Case 1: Baru-	nomal-open		· .	e e e e e e e e e e e e e e e e e e e	i san ing
				andri ti shekarar e	
					· ·
Deformation	Scale;	: 0.107cm M	iax. : 0.090 cm	alert tele	
			• .		÷ .
	•		· · · · · · · · · · · · · · · · · · ·		
					· · · · ·
			· .		
		4			
					ana ang sang sang sang sang sang sang sa
이가 실망하는 것이 가지 않는 것이다. 하는 것이 있는 것이 같은 것이 있는 것이 있는 것이 있다.				en general de la compañía. A la compañía de la c	
한 경험은 일종은 가지?					
				Flgure - 15	

an goldelik an Andrea Bellen an Altan Antonia et al contrato ga contrato e catalo e contrato e contrato de con

avalence and 5 N N 1 30/77 Baru Gete Case 1: Baru-nomal-open . . . Bending Moment Scale : 57. 30tf·m max. : -31. 53 tf·m -0.000 Ê, 31. 535 Figure - 15 (2) 3 - 89

Baru Gete

C

E)

()

Case 1: Baru-nomal-open

3.116

3-1 C.C

Shear Stress	Scale	: 27.96tf	max. : 3.71 tf
		and the second	11 N N N N N N N N N N N N N N N N N N

B. 710

34/77

-3. 710

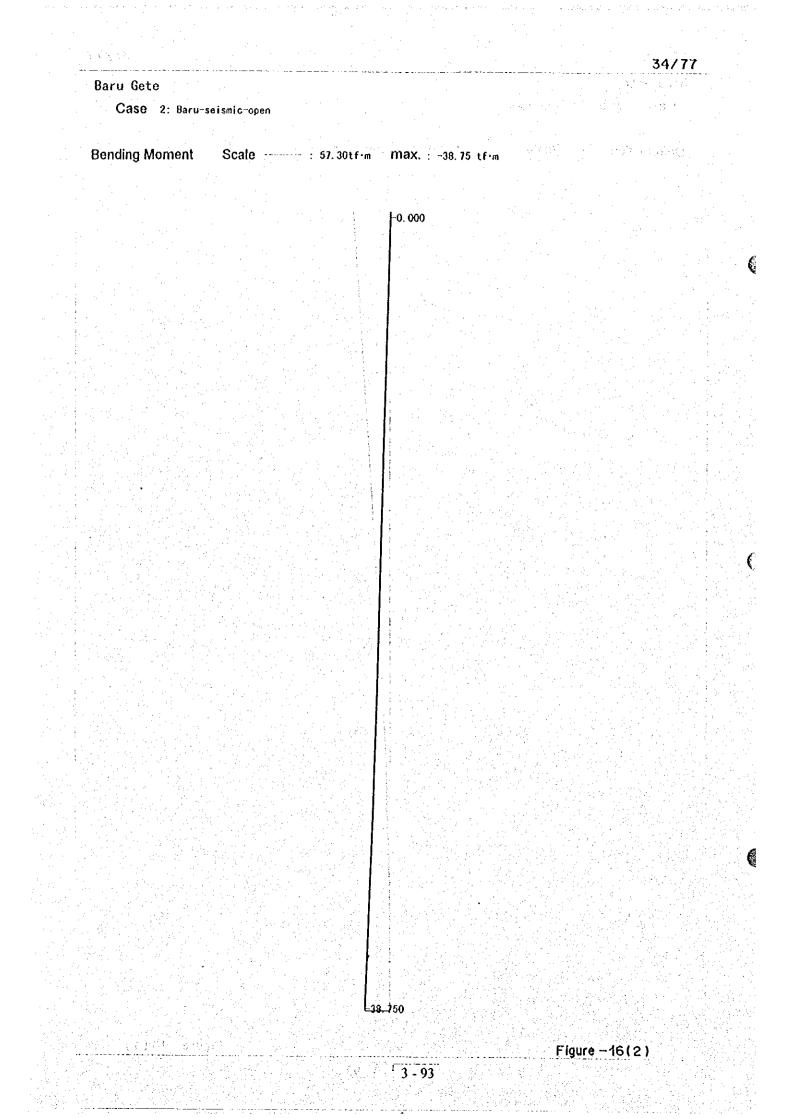
Figure -15(3)

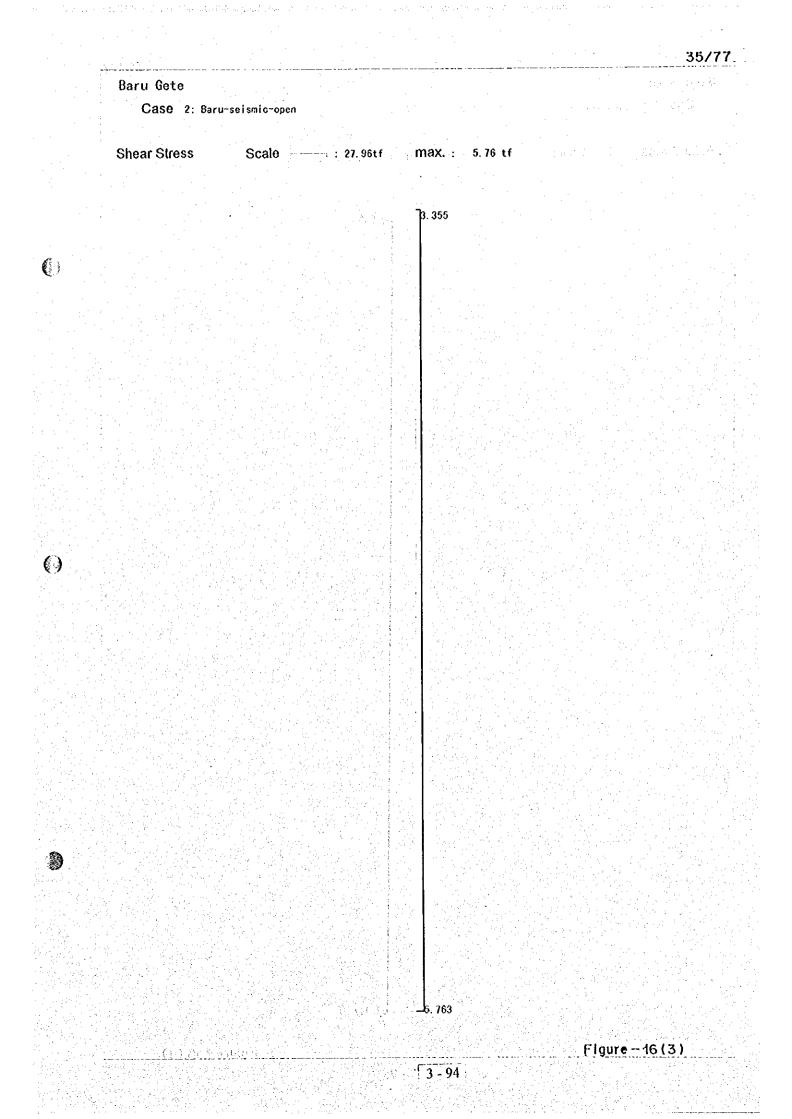
32/77 Baru Gete Case 1: Baru-nomal-open sa sist Axial Stress Scale _____: 52.39tf ____max. : 52.39 tf 30. 500 B

Figure -15 (4)

62.387

	77.174
	33/77
Baru Gete	
Case 2: Baru-seismic-open	
De formalismo Comla	
Deformation Scale	n Max. : 0. 104 cm
	그 김 영상은 것은 것은 것은 것이 없다.
	의 그는 이 것을 같은 것을 가 같은 것을 받는 것을 줄 수 있다.
사람이 있는 것은 것은 것이 있는 것을 가지 않는 것이 있는 것이다. 이 같은 것은 바람들은 것은 것은 것을 것이 것 같은 것이 있는 것이다.	
	그는 그는 것은 것을 다 있는 것을 가지?
	그는 말 같은 것을 하는 것을 것을 하는 것을 하는 것을 하는 것을 수 있다.
는 사람이 가지 통해 실려 가지 않는 것이 있는 것이 있는 것이 있다. 같은 것은 것은 것은 것은 것이 같은 것은 것은 것이 있는 것이 같은 것이 같이 있다.	
	<u> Figure - 16 (1)</u>
	<u>7 190 e - 10 (17)</u> 3 - 92
는 가장에 있는 것이 있는 것은 것이 것이 같은 것이 가지 않는 것이다. 같은 것은 것은 것이 같은 것이 가지 않는 것이 같은 것이 같은 것이 같은 것이다.	
요즘 같은 것 같은 것 같은 것 같은 것 같이	





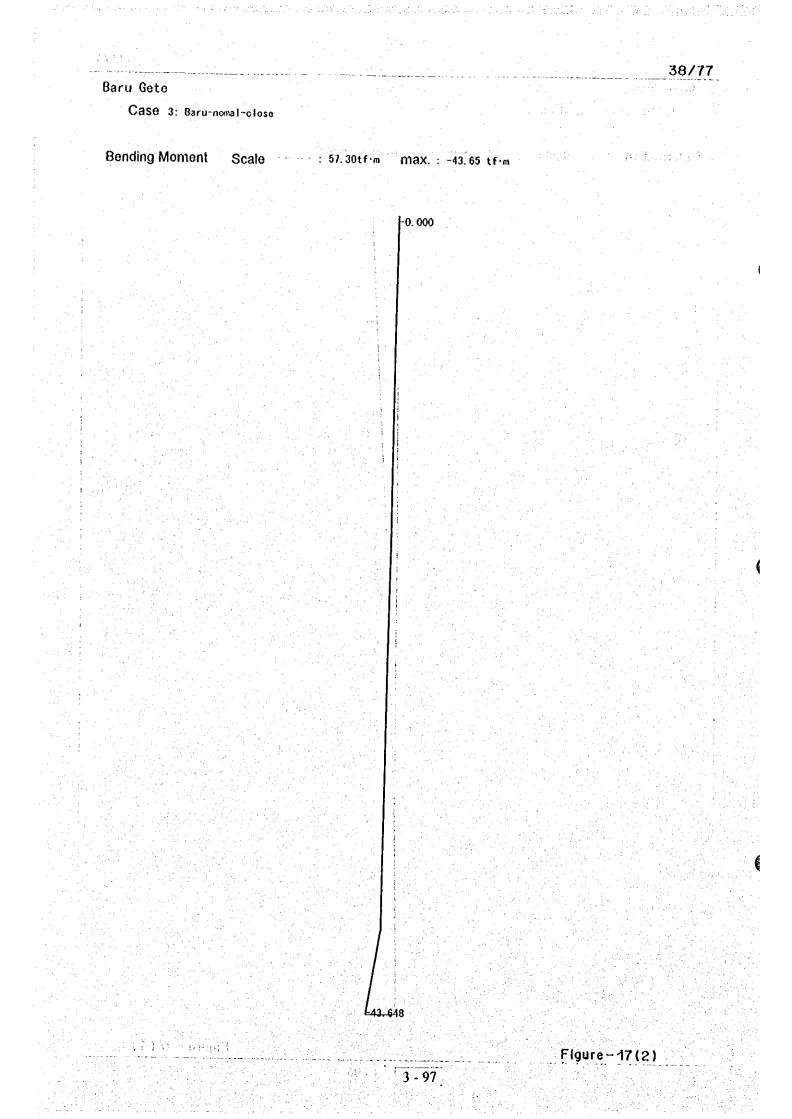
36/77 Baru Gete and the stand Case 2: Baru-seismic-open 1.4.5.5.5.5.5 30. 500 ()() 62.387 Figure - 16 (4)

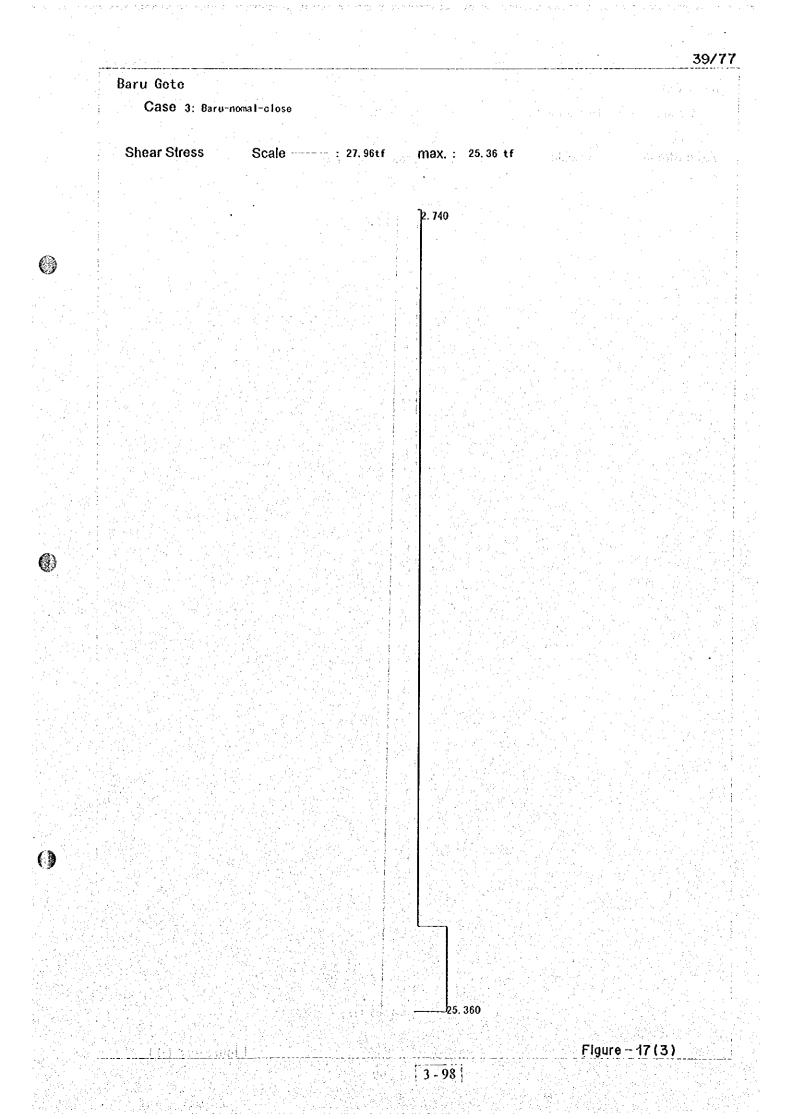
han sheke hada

Baru Gete					en e	
Case 3: Baru-	nomal-close					
Case 5. baru	10131 01036					
.	0	107	OV - 0.076	•		
Deformation	Scale	. 107cm 11	1ax.: 0.070 cm	114 - C	$T_{n,p}(T) = \int_{-\infty}^{\infty} dt \int$	
		•	· · ·			
	· · · · · · · · · · · · · · · · · · ·					
	•				·	:
· · · ·		1		1		
			·			5 ¹
с. 						an a
						an ta ka Ang ang ang
				an a		
				and a second		
お (新聞) たたた (1997)。 1995年 - 1997年 - 1997年						
				Fig	ure - 17 (1)	
			3 - 96			

Souther States and

()



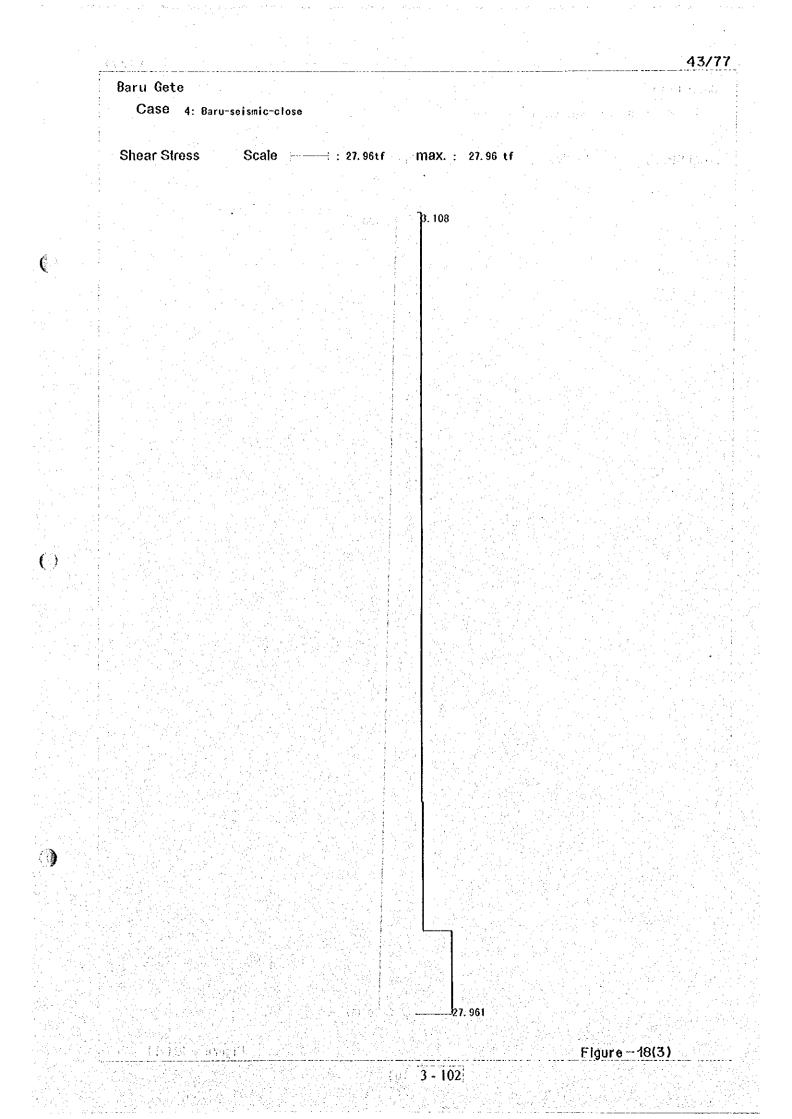


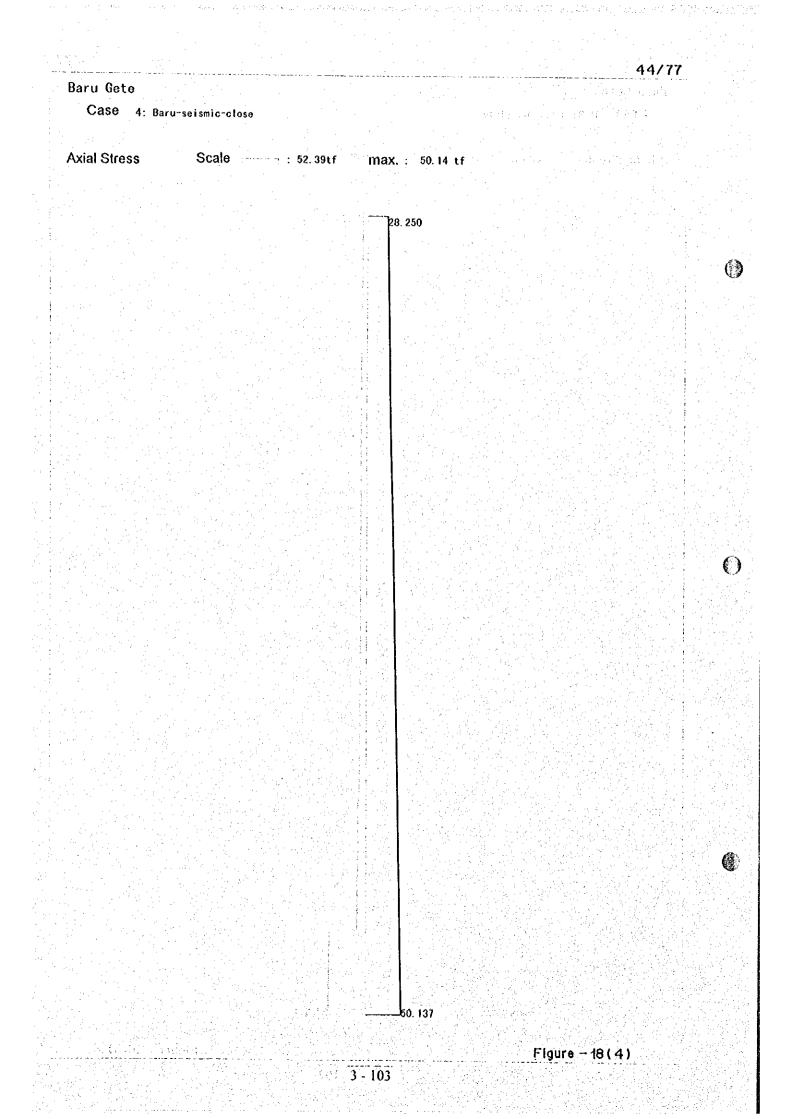
	· · · · · · · · · · · · · · · · · · ·							40/77	
Baru Gete		· ·						· .	
Case 3: Baru	-nomat-close				and di pro				
					the second				
Axial Stress	Scale	: 52.39tf	max. : 50). 14 tf	an a				÷.
				1			- -	n en	
									2
			28. 250				• .		
		· · ·							
						tan sa Strandar a saatti Strandar a	e Arge		
				an an san sa sa sa An an an an An an an an an an an an an	, sel es				
									•
									• •
	nder geschieden. Regeliefen en state								
									•
									•
									· •.
									. ;
									•
			에 가지 있었다. 동네 이 아파						
									•
•									
				use de la composición La composición de la composición de la composición de la composición de la composición de					· ·
									÷.
									÷.
			新山城 (201) 全市市 (201)						
							n Atta Grant da		
									i. A
		가 있는 것 같은 것 같다. 한 고려는 것 같은 것 같은 것		7					
					F	igure -1	7 (1 1		
میں کے بلے میں بیان کو اور استان کو اور اور اور اور اور اور اور اور اور او		ويعود فالجاري والمراجع	3 - 99		!	. YALA _ [1.141		

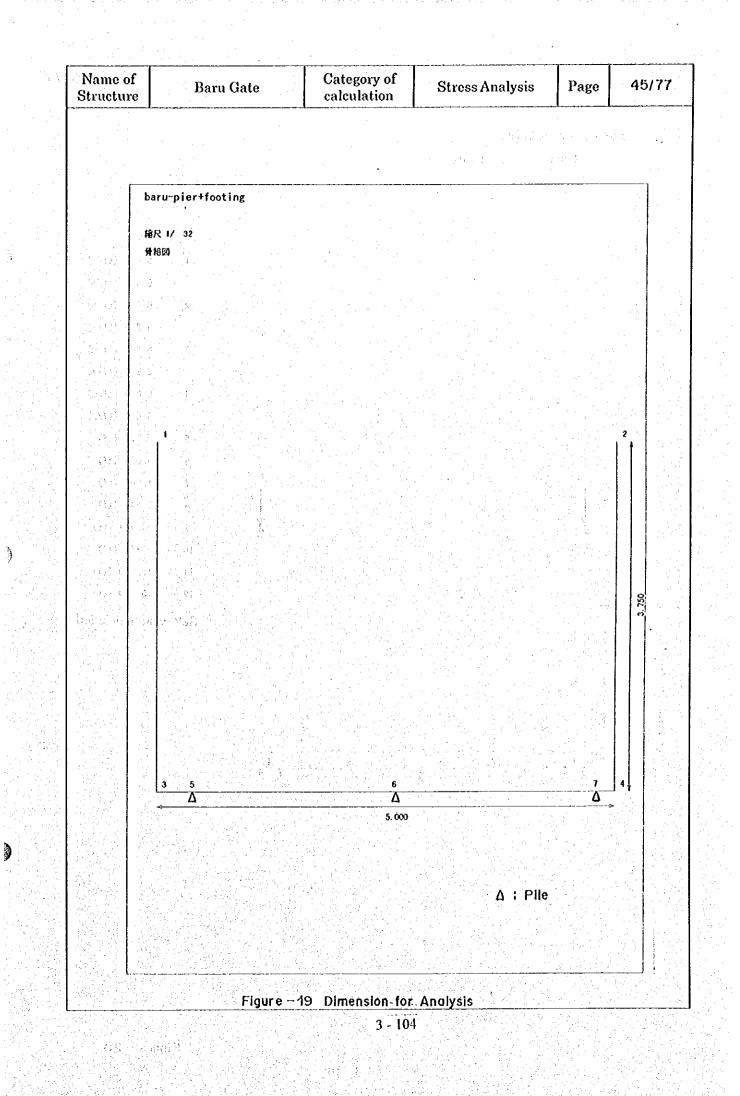
Keel and the s

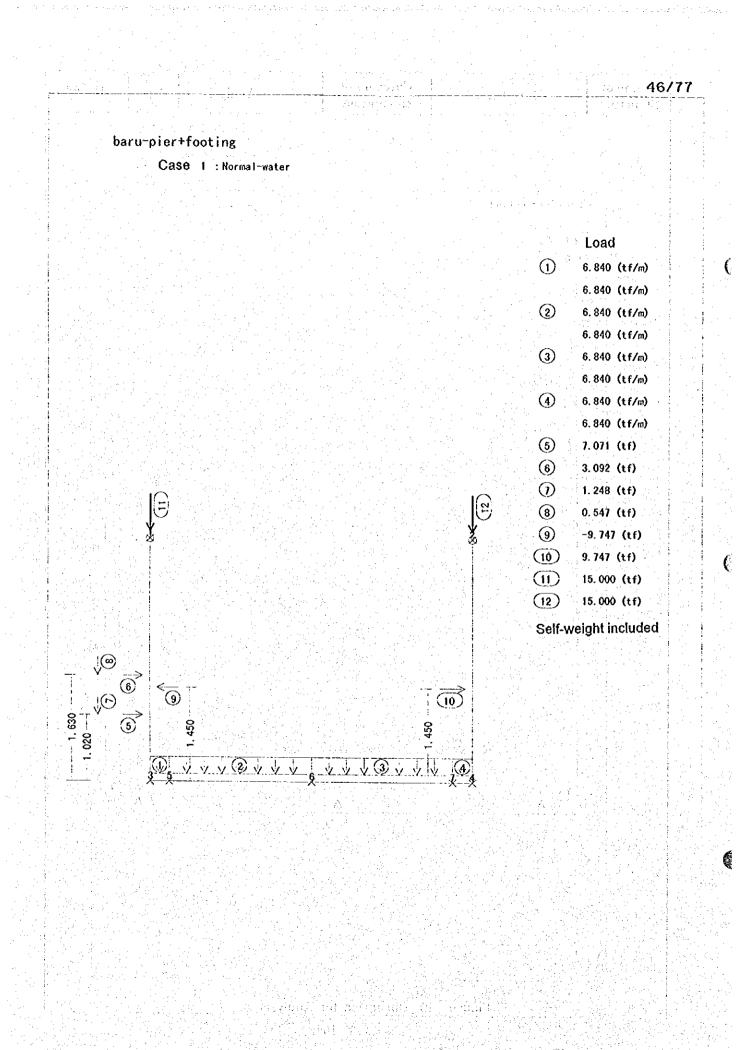
	Baru Gete Case 4: Baru-seismic-c					en e
	Case 4: Baru-seismic-c					· · · · · ·
		lose		· .		as galabati se
				<u>s</u>		
	Deformation Scale	: 0. 107cm	max. :	0.107 cm	an de la compañía de	ar en a compaña de la comp
			•			
1						
	• • • • • • • • • • • • • • • • • • •		93 I			
· . · .			i i			
				• •	1	
						1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
ana Baranga				ant in the second		
				1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		
					· · · · ·	
			n an tha said Traightean		Flour	e-18(1)

 $\{x,y\}$ 42/77 Baru Gete Case 4: Baru-seismic-close t all a glag alltra are -0.000 (7 **6**) L51.300 Figure - 18(2) 3 - 101









Flgure - 20