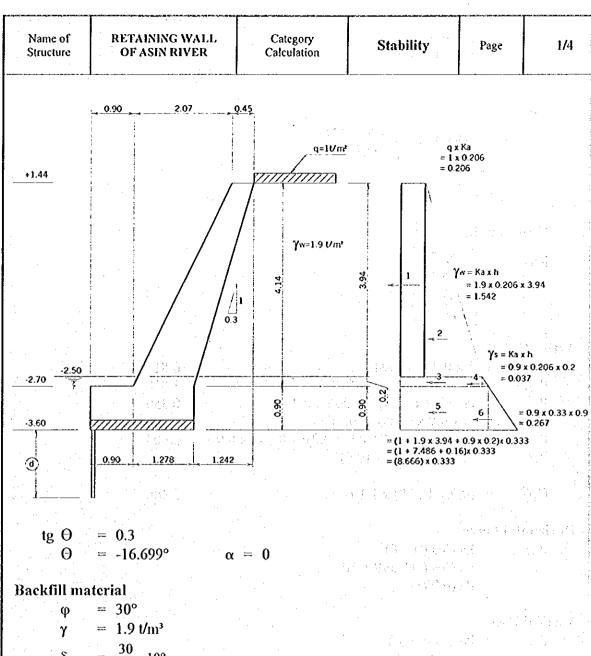
- 2.1 Asin Pumping Station
- 2.1.6 Structural Calculation of Asin Revetment



$$\varphi = 30^{\circ}$$

$$\gamma = 1.9 \text{ t/m}^{3}$$

$$\delta = \frac{30}{3} = 10^{\circ}$$

$$C = 0$$

$$Ka = \frac{Cos^{2}(\varphi - \theta)}{Cos^{2}\theta \cdot Cos(\varphi + \theta) \cdot \left[1 + \sqrt{\frac{Sin(\varphi + \theta) \cdot Sin(\varphi - \alpha)}{Cos(\theta + \delta) \cdot Cos(\theta - \alpha)}}\right]^{2}}$$

Name of Structure	RETAINING WALL, OF ASIN RIVER	Category Calculation	Stability	Page	2/4
$Ka_1 = -$	0.47			<u>L.,</u>	1
λα ₁ = -	$0.918(0.933) \cdot \left[1 + \sqrt{\frac{0.6420}{0.99300}}\right]$	(0.5)			
*	$\frac{0.47}{2.279} = 0.206$				*
	2.219				
Vertica	l wall, $\delta = 0$				
Ka ₂	$=\frac{1-Sin\varphi}{}$				
	$1 + Sin\varphi$				
	$=\frac{1-0.5}{1+0.5}=0.333$	선모양 개통			
Active For					
	$= 1 \times 0.206 \times 3.94$		= 0.811		
P _{a3}	$= \frac{1}{2} \times 1.9 \times (3.94)^2 \times 0$ $= (1 + 1.9 \times 3.94) \times 0.2$.206 206 v 0 2	= 3.038		
P _{a4}	$= (1 + 1.9 \times 3.94) \times 0.2$ = $\frac{1}{2} \times 0.9 \times 0.206 \times (0.206)$.2) ²	= 0.350 = 0.008		
P _{a5}	$= (1 + 1.9 \times 3.94 + 0.9)$	$\times 0.2)^2 \times 0.333 \times 0.000$	0.9 = 2,600		
P_{ab}	$= \% \times 0.9 \times 0.33 \times (0.9)$))²	= 0,120		
Up↑	$= (0.9 + 1.278) \times 1.10$		= 2.400		
Horizontal	Force				
P_{aH}	= Pa Cos $(0 + \delta)$			1	
	= Pa Cos (-16.699 + 10)))			
	= Pa (0.993)				
Vertical Fo	rce	er en troppede en			
PaV	= Pa Sin $(\theta + \delta)$				
	= Pa Sin (-16.699 + 10 = Pa (0.117))			
	14(0.117)				
	zontal Force				
P _{aH1}	$= 0.811 \times (0.993)$		= 0.805	←	
P_{aH2} P_{aH3}	$= 3.038 \times (0.993)$ $= 0.350 \times (0.993)$		= 3.017	(
P _{al14}	= 0.350 x (0.993) = 0.008 x (0.993)		= 0.348	←	
P _{aH5}	$= 2.60 \times (0.993)$		= 0.008 = 2.582	←	
Pali6	$= 0.12 \times (0.993)$		= 2.362 $= 0.119$		
Total			= 6.879		
化多层型 化二氯甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲二甲	izontal Force				
	sume 20°	类的 英数			
Kp		$\frac{1.342}{0.658} = 2.039$			
P_{p1}	$= \% \times 0.6 \times 2.039 \times (0.9)$	0.658)) ²	- 0.400		
ν.	72 % 0.0 % 2.037 X (U.)		= 0.495	→	

Name of Structure	RETAINING WALL OF ASIN RIVER	Category Calculation	Stability	Page	3/4

Passive Vertical Force

1		
Pavi	$= 0.811 \times 0.117$	= 0.095 ↑
P _{aV2}	$= 3.017 \times 0.117$	= 0.353 1
Pav3	$= 0.868 \times 0.117$	= 0.101 1
Pav4	$= 0.023 \times 0.117$	= 0.003 1
:		
157	0.45 + 1.278	

$$W_1 = \frac{0.45 + 1.278}{2} \times 4.14 \times 2.3 = 9.2 \downarrow$$

$$W_2 = 2.178 \times 0.9 \times 2.3 = 4.50 \downarrow$$

Center of Wall

Force	Distance	D	Moment
1. 2.52 x 4.14	= 10.433	$\frac{2.52}{2} = 1.26$	13.146
2. 1.242 x 4.14 x ½	= 2.57	$1.278 + \frac{1.242}{3} \times 2 = 2.106$	-5.412
3. 2.07 x 4.14 x ½	= 4.285	$\frac{2.07}{3} = 0.69$	-2.956
4. (0.45 + 1.278)x ½ x 4.14	= 3.577	1.335	-4.778

Active Moment at A

Fo	orces	Distance	Moment
Palll	0.805	$1.10 + \frac{3.94}{2} = 3.07$	2.47
P _{al12}	3.017	$1.10 + \frac{3.94}{3} = 2.413$	7.28
P _{aH3}	0.348	$0.9 + \frac{0.2}{2} = 1$	0.348
P _{alt1}	0.008	$0.9 + \frac{0.2}{3} = 0.966$	0.008
P _{aH5}	2.582	$\frac{0.9}{2} = 0.45$	1.162
PaH6	0.119	$\frac{0.9}{3} = 0.30$	0.036
P _{aVI}	0.095	$3.42 - \frac{3.94 \times 0.3}{2} = 2.829$	0.269
P _{aV2}	0.353	$3.42 - 3.94 \times 0.3 \times \frac{2}{3} = 2.632$	0.929
P _{aV3}	0.101	$(0.9 + 1.278) \times \frac{0.2}{2} = 2.278$	0.230
P _{aV4}	0.003	$(0.9+1.278) \times \frac{0.2}{3} = 2.245$	0.007
UP ↑	2.40	$\frac{(0.9+1.278)}{2}=1.089$	2.614
Total			15.353

п			THE RESERVE AND ADDRESS OF THE PARTY OF THE	Form management and a contract of		
1			,		-	
	Name of Structure	RETAINING WALL OF ASIN RIVER	Category Calculation	Stability	Page	4/4
ł		L			1	ŀ

Passive Moment at A

Forces		Distance	Moment	
P _{Pl}	0.495	$\frac{0.9}{3} = 0.3$	0.148	
WI	8.22	0.9 + 1.335 = 2.235	18.371	
W ₂	4.50	$(0.9 + 1.278) \times \frac{1}{2} = 1.089$	4.900	
Total			23.419	

Control of Bearing

$$S_F = \frac{23.419}{15.353} = 1.525$$

LOG PILE

Allowable bearing capacity for pile.

Vertical 4 t Horizontal 1.0 t

Number of Log

Total horizontal force = + active horizontal force - passive horizontal force

$$= 6.879 - 0.495$$
$$= 6.384$$

Number of Log =
$$\frac{6.879 - 0.495}{1.0} \approx 6.5 Nos$$
$$\approx 7 Nos$$

Total vertical force =
$$w_1 + w_2$$

= $8.22 + 4.50$ = 12.72 ton

Number of log =
$$\frac{12.72}{4} = 4Nos$$

As the final design, the number of logs per meter stretch is eight (0.5 m interval)

- 2.1 Asin Pumping Station
- 2.1.7 Structural Calculation of Steel Sheet Pile

Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page	1/12
7.2.2 Actir	gn of Sheet Pile Coffering ng Force and Load Calcul				
	er Bed Elevation	EL -2.43		Stophysik	en ted a f
Design Cro	ater Level (normal and ear est Elevation of Coffering evation of Tie-Rod	EI	75m - +1.875m - +0.875m		
		El	3 10.073111 14 2 15 4 2 1 1 1	eri. Litari etabe	
(1) Hydrostation P= γ _w ×h ² /2	where P;	hydrostatic pressur height of water out			
	$\gamma_{\scriptscriptstyle N}$; unit weight of wat			
γ,,	= 0.375-(-2.435)=2.81 m = 1.0 tf/m ³		e Alling and the color Haling common color		
$P = 1 \times 2.81$ = 3.95 tf	•				
(2) Residual W	Vater Pressure in the Wall				
$P'=\gamma_{v}/2\times(2$		er pressure in the wa it of water outside (i			
as h		weight of water (tf/			
γ,,	$= 1.0 \text{ tf/m}^3$				
$P = 1/2 \times (2i)$ $= 1/2 \times 1.3$	/3×2.81) ² 873 ²				
=1.754 t	f/m t =EL-2.435+1.873/3				
	=EL-2.435+0.624 =EL-1.811				
	Soil in the Wall				
W=B(γH ₁ +	B : width o	of soil in the wall(to of wall(m)			
		ess of upper layer(ab ess of lower layer(be			
		eight of soil (tf/m³) ed unit weight of so	il (tf/m³)		
as y	= 1.9(sandy soil, wet,	, compacted)			
γ _ο Η	= 1.9(sandy soil, satu	rated, compacted)	5+0 937=2 437m		
Н	$= 2/3 \times (0.375 - (-2.435))$))=1.873m			
W	$Y = B \times (1.9 \times 2.437 + 1.9)$	×1.873)=8.189B ti/r			
(4) Earth Press p _a =K _a (Σγ _i h		pressure	GERMANIAN Nama	inkarini. Bahi Alm	
$p_p = K_p(\Sigma \gamma_i h)$	i) p _p : passive eart		Sure		
	Kp: coefficient	of passive earth pre of soil in the ith lay	essure		
	로 하게 하기는 장동을 내렸다는				18 18 18 18 18 18 18 18 18 18 18 18 18 1

					7	
Name of Structure	1 21121	EL SHEET PILE	Category Calculation	Structural Calculation	Page	2/12
	0.309, K _p =2 0.404, K _{ep} =		250	y day tu wiqifi so mila (ili Vigi ili Taka		
K _a =(K _{ca} = active e (EL-0.5 d p _e p _e P	$0.368, K_p=2$ $0.474, K_{ep}=1$ $0.474, K_{ep}=$	2.34 re of clay in the wa 75-(-0.562)=2.437 ×2.437×0.309=1.4 ×2.437×0.404=1.8 31×2.437/2=1.744 71×2.437/2=2.280 = 2.437/3-0.562= 662-(-1.000)=0.438 0×2.437×0.309+0.5	m 31 tf/m/m 71 tf/m/m tf/m tf/m EL+0.250m 3m 0×0.438×0.309)=1.	431+0.122=1.553 t	f/m/m	
ac (EL-2.4 d ₃	$_{a2} = (1.9)_{a2} = (p_{a1})_{a2} = (p_{ea})_{ea2} = (p_{ea})_{ea2} = (p_{ea})_{ea3}$ etting point = -2.4	$0 \times 2.437 \times 0.404 + 0.9$ + p_{a2}) $\times d_2/2 = (1.431$ 1+ p_{ea2}) $\times d_2/2 = (1.83$ = EL-1.000m+ = EL-1+(0.438/ = EL-1+0.507 = EL-0.493	0×0.438×0.404)=1.; 1 +1.553)×0.438/2= 71 +2.030)×0.438/3 (d ₂ /2×p _{a1} + d ₂ /3×(p _a 12*1.431+0.438/3*(871+0.159=2.030 t =0.653tf/m 2=0.854tf/m ₂ - p _{a1}))/ P _{a2} :1.553-1.431)/0.653	f/m/m	
$P_{ea3} =$	$= 1.42$ $= 2.02$ $= 1.82$ $= 1.82$ $= 2.64$ $(p_{a2} + p_{a3})^{3}$	31+0.122+0.475 28 tf/m/m 0×2.437×0.404+0.5 71+0.159+0.612 42 tf/m/m ×d ₃ /2=(1.553 +2.02)×d ₃ /2=(2.030 +2.6 = EL-2.435+ (d	9×0.438×0.309+0.9 9×0.438×0.404+0.9 98)×1.435/2=2.569 942)×1.435/2=3.35 9/2×p _{a2} + d ₃ /3×(p _{a3} - 435/2*1.553+1.435	1×1.435×0.474) tt/m (2tt/m (2a ₂))/ P _{a3}	2.569	
(EL-2.4 d ₁ p _a P	35m) = -1-(1 = 0.99 1 = 1.43	e of clay upstream -2.435)=1.435m ×1.435×0.368=0.4 35×0.475/2=0.3410 = EL-2.435+1.4 = EL-2.435+0.4 = EL-1.957	75tf/m/m f/m 35/3 78			
7.2.3 St	udy of Stab	ility of Wall				
(1) Stability	against Sh	earing Force				

Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page	3/12
$FM_d \ll M_c$	-		eismic conditions)		
4.4	M _d : shearing n				
2) Shearing M	M _r : resistance	moment (tfm)		and the state of t	
	oment is calculated as fo	llows			
	moment by hydrostatic p				
	ndition and carthquake co				* * * * * * * * * * * * * * * * * * *
$M_d = \gamma_w \times h^3/e$				1 1 4 3 1	
$=1.0\times2.81$.*
=3.698 tf.			i jasijis	All the E	
	moment by inertia of soil		uake condition)		
m _d =Kn(((L	$(H_1\gamma)(H_2+H_1/2))+(B\gamma_bH_2)^2$	/2)) : of water (tf/m³) (=	1.00		
		of soil (tf/m³) (=1.9			
		of saturated soil (tf			erio e Antonio
		mic coefficient (=0			
			a The grant of the grant		
	11×(((B×2.437×1.9)×(1.8	,, , , , , , , , , , , , , , , , , , ,	1.9×1.873²/2))		
	11*(4.630B*3.092+3.333	B))			
= 1.5	9414B			1. 2. E. C.	
Therefore			·静华 (1964年)		1980
Therefore, (normal cor	ndition)				
$M_d=3.698 t$			randrikus Bandrika bandas		
(earthquake					
$M_d = 3.698 +$					
) Resistance					A Itali
$M_c=1/6\times\gamma_m$	moment is calculated as f				
	of wall (m)	BATTON JOHN SET JOHN TOTAL	gant Miller of Children and Chi		4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
v = B/H		20B			
	ernal friction angle of soil		.6)		
	nverted unit weight of so				n Filipina in
γ _m '. st	ıbmerged unit weight of s	oil in the wall (tf/m	³) (=0.9)	Section 2	
					te e
Normal con				Edward II	
R = 2/3	3²(3-ν cos φ) tanφ sinφ 3*(0.2320B) ²(3-0.2320B*	*00075 6\ton75 6*c	i25 6		
	380*(3-0.2092B)*(0.232		III.2.3.0 9		e en Elita e. Guidea de la composição
	4140-0.02887B)*0.05382				en e
= 0.0)2228B ² -0.001554B ³				
	02228B ² -0.00[554B ³)*4	1.31 ³			
= 1.7	⁷ 84B ² -0.1244B ³			se i klisty k z.	April Artis
	T (2)11 \ (1)				
	Ι ₁ +γ'Η ₂)/Η 9*2.437+1.9*1.873)/4.31			at on the y	Bright St.
= 1.9					
therefore,					
	5×1.9×(1.784B²-0.1244B³	')			
= 0.5	649B ² -0.03939B ³				
Seismic con					- ()
2	3-ν cosφ)sinφ			er film to see it	

Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page	4/12
= (0.05382B ² *(3-0.2320B*co	s25.6)*sin25.6			
= (0.02325B ² *(3-0.2092B)				
	$0.06975B^2$ - $0.004864B^3$	destablicati			
KH' = (0.06975B²-0.004864B³)*4 .5844B²-0.3894B³	1.313	g Plack standischer		
the second secon	,,3644Β -0,3894Β γΗ _ι +γ'Η ₂ ')/Η	· ·			
	.9				
$M_r = 1$	/6×γ _m (RH³)			and the state	
= 1	/6*1.9*(5.5844B ² -0.3894I	B ³)			Sayle, S
= 1	$.7684B^2 - 0.1233B^3$				
)) D	gradien in de Artistation († 1865). Matematika				
2) Design of M _c -Fs* M					
141-1-2 141					
lormal cond	ition				
	$0.03939B^3 - 1.20*3.698 > = 0$) trî liki ku î. s			
	$-0.5649B^2+4.4376 \le 0$				
B>=3.18n					
anthauaica					
arthquake o					
1./084B*-	0.1233B³-1.2*(3.698 +1.9 1.7684B²+2.3297B+4.437	/414B)>=0			
B>=2.12 r		0<=U		an a da d	ongon dakon. Bulangan
	width of the wall is design	ned as 3.2m			
				ario mentione	
	ty against sliding				使有效效应
1) Basic form	iula for stability against slidin	~ : C-11		Tagana and Anna and	7
F=B(Wμ+		g is as ionows;			rannary Canada
	y factor (1.2 for normal co	ndition, 1.0 for seis	mic condition)		
W: unit	weight of soil in the wall ((tf/m³)			
		=γ _m H			
	eismic condition W	'=γ _m 'H		jihaj pi	
μ : tan ϕ	AC:	Till and the beginning of	give the first this	1. 10 x 4x 7 x 3	
φ. angle	of internal friction of exis ion of existing ground	ting ground (°) (tf/m²)			A.
	orizontal force (tf/m)	(ш/ш)			
) Horizontal	force acting on the wall	e de la companya de			
ormal condi			美国共和国共和党会	等1900年表。	
Committee of the Committee of the	1.1 4、大学、大学、大学、大学、大学、学习、				
Hydrostati	c pressure: 3.95 tf/m				
arthquake c	ondition		人名 医二氏性性原物性结合 法人的法证法的复数证据	er og Miller Billion	
ar ir Tolka is	c pressure: 3.95 tf/m				
Inertia acti	ng on the wall:				
	B×2.437×1.9)+(B×1.9×1.	873))		all the p	
=0.11*(4.630B+3.559B)				
=0.9008					
=0.9008					
=2.88 tf	/m ==3.95+2.88=6.83 tf/m		이 그렇게 수 됐다. 현연인 기사들이 하는데 기사하다	Ny faritra di 14. Ny faritr'ora dia 5.5000.	
- I VIAI PUIÇI	マーン・プンサム・60=0.83 【【/M				2014 2004 N

Name of		Category	Structural		
Structure	STEEL SHEET PILE	Calculation	Calculation	Page	5/12
(3) Resistance	force of soil in the wall				
	tion, Earthquake conditio 7×1.9)+(1.9×1.873))×3.2×		*.479=12.55 tf/m		
(4) Safety aga	inst sliding		Attack Sad Att		marika Pekilari
Earthquake c	55/3.95=3.18>1.20 ondition				
7.2.4 Bear (1) Basic form F Qu F Qu	=Qu/W =A'(KCNc+Ky₂DfNq+½y : safety factor (normal con : ultimate bearing capacity	' ₁ B'N ₇) ndition 1.2, seismic of ground (tf/m)			
A B' B c M _B :	weight of soil in the wall effective loading area (m effective loading width to B'=B-2e width of the wall eccentricity of load (e=M moment acting on the gro incremental coefficient d K=1+0.3×(B/D)	²) aking into account of Is/W) ound			
Df : γι : γ ₂ : Nc, N	cohesion depth up to the point of cunit weight of soil above unit weight of soil below Iq, Nr: bearing capacity co EHI/W EH: horizontal force	the depth Df the depth Df			
(3) Weight of s	oil in the wall				alempi kya
	ion and earthquake cond ×1.9)+(1.9×1.873))×3.2=8	the state of the state of the state of			
earthquake cond $M_d = 3.6$ = 3.6	t is o <u>n ;</u> 598 tf/m				

Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page 6/12
earthquake cor	udition			Tanada katawa 1924 Manada katawa 1924
	l _d /W = 9.911/26.20=0.378	3 m		n de la
iormal conditi				
arthquake cor	(B-2e)=1.0*(3.2-2*0.141 ndition ×(B-2e')=1.0*(3.2-2*0.37			
On the other h	and, the coefficient of bea	ring capacity is cal	lculated as follows;	
Normal condi				
	Il force; H=3.95 tf/m in the wall; W=26.20tf/m			
7a110=3.93/20. <i>∲</i> =25.6° C=1.0 tf/m²	20-0.131			
Nr=4 Nc=15				
Earthquake c				
Weight of soil Γαnθ=6.83/26.	I force; H=6.83 tf/m in the wall; W=26.20tf/m 20=0.261			
Ø=25.6° C=1.0 tf/m² Nr=2			Albert Herricher	
Nc=12 Therefore, the	ultimate bearing capacity	is		
Normal condit	ion			
= 2.8	.0×C×Nc+1/2×71×B'×Nr 15*(1*1*15+1/2*1.0*2.8) 07 tf/m			
Earthquake co	ndition			
Qu' = A'(= 2.4	1.0×C×Nc +1/2×γ ₁ ×B'×N 16*(1*1*12+1/2*1.0*2.4 83 tf/m			
safety factor is				
Normal condit Fs = Qu = 58.				
Earthquake co Fs = Qu	'/W			
= 34.	83/26.20 = 1.33>1.0			
725 Design	of Steel Sheet Pile			afish gyldhan fiakk

	ennament niskus grevem tolonije. V	File Chine and is	alente (Marie e e e	The Artist	di e i i i i i i i i i i i i i i i i i i
Name of Structure	Steel sheet pile	Category Calculation	Structural Calculation	Page	7/12
(1) Basci	formula				
	FM A			and products	
MA Mn	$= P_A I_A + P_W I_W$, · · · · · · · · · · · · · · · · · · ·		•
Mp Mp	= Pp+Pwlw: moment around tie rod	hook by passive ea	orth pressure (tfm/m)	
M _A	: moment around tie rod	hook by active ear	th pressure (tfm/m)		± 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
D Pp	: calculated depth of imb : passive earth pressure		n)		;
Lp	: arm length of action of	• •) (************************************		
P_{A}	: active earth pressure (t				
l I _A Pw	: arm length of action of : residual water pressure				
lw	: arm length of action of)		ng milatin ng Nasarang Kather
F	: safety factor (1.2)				
(2) Calcu	lation of moment around	the tie rod			
Assuming the	depth of imbedded sheet p	ile as D	in de la companya di Salah di Salah di Salah di Sa		
 Normal condi	tion				
			n de Hadila (1905). Nacionale de la compansión		
	r Pressure in the Wall				
,	754 tf/m 875-(-1.811)		rizar nelativa. Nota e de la comita		
	686				
	873*D*1/2			in a feetily	
6.7.5	9365D tf/m 875-(-2.435)+D/3				
	31+D/3				
Active earth p	ressure			3. 重建医量4 3. 1 (1 · 3 · 3 · 5 · 5 · 5 · 5 · 5 · 5 · 5 · 5	
(EL-0.562m)				Maria (Mariente) Maria (Mariente)	
$P_{a1} = 1.$	744tf/m				
Arm = 0. $= 0.$				in Huseli Kalendari Sandari da K	n de la companie de La companie de la co
(EL-1.000m)					
$P_{a2} = 0.$ $Arm = 0$	653tf/m 875-(-0.493)				
= 1.				강하는 말하는 (14) 전공화	
(EL-2.435m)	5.CO.Cl				
$P_{a3} = 2.$ $Arm = 0.$	875-(-1.841)				
= 2.	716				
(below El-2.43 $d_4 = D$					
(i) comp	The CAN CONTROL OF THE CANADA CONTROL OF THE				
	$p_{a3} \times d_4 = 2.028 \times D$				
acting po = EL-2	oint ,435-D/2				
Arm =	0.875-(-2.435-D/2)				
= (ii) comp	3.31+D/2				
	1/2*D ² *0.9*0.368=0.165	56×D²		ind Esta Kalika	
acting po	the contract of the contract o				
			of the second second of the second	and the term of the	

PARKET CARREST CONTRACTOR CONTRAC	THE CONTRACT OF THE CONTRACT O				<u> </u>
Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page	8/12
=	EL-2.435-2/3D			Jacob J.	
	0.875-(-2.435-2/3D)			e e Marija	
=	3.31+2/3D				ar francisco Horizon Horizon
Passive earth r	pressure	antag Majarati begana dar		ing a militar Long and pinda	19 h
(below El-2.43	21053410	granda and Adams	the second secon	ara Maria da Salara. Para da Salara da S	
•	D	A HONGE BUILDING			
P _{pi} =	$1/2*D^2*0.9*2=0.9\times D^2$		iling state of the		
acting p					
	EL-2.435-2/3D 0.875-(-2.435-2/3D)	tang basa dan pipula	a hir ajan Panjai		
YIEL =			y sykring pale his		2011 1991
total driving m	oment around the tie rod i	j (Aug San Armen) (A. S	Andrewski (m. 1914) 1994 – Charles Sandar		
Md =	11.01 2.000				
	+ 0.9365D*(3.31+0.333) + 1.744*0.625	D)	na Pamao na Jaga	v springe	
	+ 0.653*1.368		an funnasia kan	n 11, 50	
	+ 2.569*2.716			-	
	+ (2.028*D)*(3.31+D/2)				- 100 시원 15 15 15 15 15 15 15 15 15 15 15 15 15
===	+ (0.1656*D ²)*(3.31+2/; 4.711+3.100D+0.312D ²	3D)			
	$+6.71D+1.014D^2+0.548$	r1.090+0.893+6.97 S1D ² +0.1104D ³			
=	0.1104D ³ +1.8741D ² +9.8	31D+13.67			
	nent around the tie rod is				
	0.9×D²)*(3.31+2/3D) 600D³+2.979D²				
	nould be over 1.2 for both	normal and earthou	ake conditions		
Mr>=Fs*N	1d				
0.600D³+2	$.979D^2 > = 1.2*(0.1104D^3 + 0.7301E^2 + 0.1104D^3 + 0.7301E^2 +$	1.8741D ² +9.81D+1	3.67)		en in de la companie de la companie La companie de la co
0.4675D + D>=3.46m	0.7301D²-11.77D-16.40>=	=0			
D. 3.10111					
					7.
Earthquake c	<u>ondition</u>				
Residual Wate	r Pressure in the Wall			elin (j. 1865). Ogađenija stanovanska	
$P_h = 1.$					
	875-(-1.811)			200	
= 2.	686				toni felfisii.
	873*D*1/2 9365D tf/m			i e de la composición de la composición La composición de la composición de l	
	9303D (1/111 875-(-2.435)+D/3				
	31+D/3				
Active earth pr	<u>essure</u>				
$(EL-0.562m)$ $P_{al} = 2.$	280 tf/m				
Arm = 0.					
= 0.	625				
(EL-1.000m)					
$P_{a2} = 0.$ $Arm = 0$	854tf/m 875-(-0.493)				
Ann = 0. $= 1.$					
					身足性病

Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page	9/12
EL-2.435m)				The Indian	
$P_{a3} = 3.$				jan i de	
).875-(-1.841) 716		and the control of the safe		
= 2. below El-2.43				·	
$d_1 = D$				in Marketin	
•	ponent-1			3 - [5]	
• • •	ponem-1 = p _{ea3} ×d₄=2.642×D	territoria de la companya de la comp	• •		
acting p	point		til tid stårener i till s Blatter sterlig strære i		
= EL-2	2.435-D/2		ang kang mendebah pada berai Manada mendebah kang Meri		
	= 0.875-(-2.435-D/2)				
	3.31 27.5		$(1,1)^{\frac{1}{2}} \cdot (1,1)^{\frac{1}{2}} = 1$		
	nponent-2	•		$(1,0,1)\in M_{n,q}$	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	1/2*D ² *0.9*0.474=0.21	.33×D²			
acting po				$\{(i,j),(i,j)\}$	100
and the second second second	2.435-2/3D = 0.875-(-2.435-2/3D)				
	• 0.875-(-2.435-2/3D) • 3.31+2/3D		King graven		
en e	3.3 (TZ/3D				
Passive ea	rth pressure				
(below El-2				n EMerika eska nama eskalari	
$d_4 = D$	2.455111)				
	$0^2*0.9*2.34=1.053\times D^2$		en e		
acting poin			(李维)的人员:#1111100000000000000000000000000000000		
= EL-2.43		A STATE OF THE STA			
Arm = 0.3	.875-(-2.435-2/3D)				
= 3.	.31+2/3D				
	ng moment around the tie	rod is			Liney.
	.754*2.686				
	0.9365D*(3.31+0.333D)				$\mathcal{N}_{\mathcal{A}} = \mathcal{N}_{\mathcal{A}}$
	2.280*0.625			$\mathbb{E}_{\mathbb{R}^{n}} = \mathbb{E}_{\mathbb{R}^{n}} \times \mathbb{E}_{\mathbb{R}^{n}} \times \mathbb{E}_{\mathbb{R}^{n}}$	
	0.854*1.368 3.352*2.716				
the second secon	3.352*2./16 (2.642*D)*(3.31+D/2)				
	(2.642*D)*(3.31+D/2) (0.2133*D ²)*(3.31+2/3D)				
= 4	.711+3.100D+0.312D ² +1.	425+1 168+9.104+	· ୧ 745D		
+	$1.321D^2 + 0.7060D^2 + 0.142$	22D ³	0.1735		
= 0.	.1422D ³ +2.339D ² +11.854	ID+16.41		$\mathbb{R}^{n-1}_{\mathrm{cond}_{H}(V)}$	
resistance n	moment around the tie rod	and the second s			
Mr = (1.	1.053×D ²)*(3.31+2/3D)		Restablished		
= 0.1	.702D ³ +3.485D ²				al-lighter?
	or should be over 1.2 for b	oth normal and ear	thquake conditions		MARK
$M_{\Gamma} > = F_S * M$		-2			
	$.485D^2 > = 1.2*(0.1422D^3 + 0.6782D^2 - 14.225D - 19.69 > $		-16.41)		
= 0.5314D²+(= D>=3.61m			ri (j. 1. japan masa ata Indonésia da kabupatèn		
ייינסייכ-לת					ag Kronsky vol. a Oliver og
Therefore.	the depth is determined in	a aarthauake condit	[!] ^n and D≔3 61m		
		a carinquake conditi ASAAAAAA		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
	2.435+3.61=7.92m \rightarrow 8m (
(iii) Reac	ction of imaginary support	ing point			
The state of the s	the second secon	— — •	ound) is the distance		and the second

W. C. William D. C. William Co., Mary Str., Mary Str., Co., Co., Co., Co., Co., Co., Co., Co					
Name of Structure	STEEL SHEET PILE	Category Calculation	Structur Calculati	l Daga	10/1
supporting p	oint as the foundation so	oil is clay.			
H'=0.3*4.31	=1.293m				
THE TORU OF I	he imaginary supporting	g point is calcul	ated as follows;		
Normal cond	lition		• •		
P (D = 1.293)	m)				***
	+pw'-ppd			To the Article 1917 as In this way to the Article	
pad;	active earth pressure un	nderground	* 1 ° 4 ° 1		
ppa;	pasive earth pressure u	nderground		arena. Vitalia	
pad = 2.02	; residual water pressure 8+0.9*0.368*1.293	underground			1.5
= 2.45					
ppd = 2.0*	1.293			e de la companya de La companya de la co	
= 2.58					
	3-1.873*1.293/3.69			10.00 A	
= 1.21 $P = 2.45$	/ 6+1.217-2.586		ing and the second of the seco		
= 1.08	3	ecure of the ime	ainant ann an air		
1.00	, tivini pre	ssure at the line	ginary supportin	g point	
Earthquake co	<u>ondition</u>				. Pylazii
P (D=1.2931	n)				
= pad+	⊦pw'-ppd				
	active earth pressure un				
	pasive earth pressure up				s Topicai
	residual water pressure	underground			
pad = 2.64 = 3.19	2+0.9*0.474*1.293			alijeni je kali dijela sebah Alijeni i vasari da diseber	
ppd = 2.34					
= 3.02				FIF Adals (SEE)	
	3-1.873*1.293/3.69				
= 1.21					
P = 3.19 = 1.38	4+1.217-3.026				
= 1.38	o u/m				
The reaction a	at the imaginary support	ing point is calc	ulated as follows		
Normal condi	<u>tion</u>			हें। क्षेत्रवाहिको	
Reaction at In	naginary Supporting Po	int; Rd	= 5.933 tf/m		
Reaction at T	ie Rod; Ap	<u>=</u>	4.416 tf/m		nadalah 1904
Coiomia acud					
Seismic cond Reaction at Ir	<u>шоп</u> naginary Supporting Pol	int. Dd	- 7 077 161.		
Reaction at T		un, Ku =	= 7.076 tf/m = 5.459 tf/m		
Maximum Assuming that	Bending Moment t the maximum moment	occurs at x m a	bove the ground	elevation (EL-2	.435m),
	.d(x+H')-S6'(x+1/3*H')				
-1·111102 — (\)	(PA3+Pw)*x*1/2x+(PA	/-0/ (XT <i>2/3*H*)</i> 34Pw-PA2\v/di)		
where dR; de	pth between W.L and D).L.(=-0.562+2.4	135=1.873m)		
Normal Cond					
Mmax = 5	.933*(x+1.293)-2.713*(x+1/3*1.293)-0	.703*(x+2/3*1.2	93) <u>() </u>	

		7	-	·	
Name of Structure	STEEL SHEET PILE	Category Calculation	Structural Calculation	Page	11/12
•	-(2.324+1.873)*x*1/2*; 5.933x+7.671-2.713x-1	x+(2.324+1.873-1.	553)*x/1.873*1/2*;	x*1/3*x	-
	$= 0.235x^3 - 2.099x^2 + 2.517x^3$. 109-0. 703x-0.606 (+5.986	-2.099X*+0,235X*	ing kalung kalung. Kabupatèn	
	stress is zero at the point of		ent. Therefore,		
dMmax/dx	0			to die	
	198x+2.517=0			tally to the title of	
x=0.677	170X.2.317 0		in the little state of		
Mmax≈6.8	30 tfin/m				era (j. 18
			114.61		
Seismic Co	andition				
Mmax =	-(2.994+1.873)*x*1/2*x	c+(2.994+1.873-2.0	30)*x/1.873*1/2*x	*1/3*x	
	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x ³ -2.434x ² +3.034x	t+(2.994+1.873-2.0 356-0.895x-0.771- t+7.022	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	*1/3*x	
= The shear s	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x ³ -2.434x ² +3.034x stress is zero at the point o	t+(2.994+1.873-2.0 356-0.895x-0.771- t+7.022	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	*1/3*x	
= The shear s	-(2.994+1.873)* $x*1/2*_x$ 7.076 $x+9.149-3.147x-1$. 0.252 x^3 -2.434 x^2 +3.034 x stress is zero at the point of	t+(2.994+1.873-2.0 356-0.895x-0.771- t+7.022	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
= The shear s	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x ³ -2.434x ² +3.034x stress is zero at the point o	t+(2.994+1.873-2.0 356-0.895x-0.771- t+7.022	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x ³ -2.434x ² +3.034x stress is zero at the point of κ =0 368x+3.034=0	t+(2.994+1.873-2.0 356-0.895x-0.771- t+7.022	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x ² -4.8 x=0.670 Mmax=8.0	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x ³ -2.434x ² +3.034x stress is zero at the point of x=0 368x+3.034=0 40 tfin/m	x+(2.994+1.873-2.0 356-0.895x-0.771- +7.022 of maximum mome	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x ³ -2.434x ² +3.034x stress is zero at the point of x=0 868x+3.034=0 40 tfm/m Section of Steel Sheet Pile	x+(2.994+1.873-2.0 356-0.895x-0.771- +7.022 of maximum mome	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S (i)	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x³-2.434x²+3.034x stress is zero at the point of 668x+3.034=0 40 tfim/m Section of Steel Sheet Pile Normal Condition Z=Mmax/sa=6.800*105/	x+(2.994+1.873-2.0 356-0.895x-0.771- x+7.022 of maximum mome	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S (i)	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x³-2.434x²+3.034x stress is zero at the point of 6868x+3.034=0 40 tfin/m Section of Steel Sheet Pile Normal Condition Z=Mmax/sa=6.800*105/ sismic Condition	x+(2.994+1.873-2.0 356-0.895x-0.771- x+7.022 of maximum mome 1800=378 cm³/m	030)*x/1.873*1/2*x 2.434x ² +0.252x ³	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S (i)	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x³-2.434x²+3.034x stress is zero at the point of 668x+3.034=0 40 tfim/m Section of Steel Sheet Pile Normal Condition Z=Mmax/sa=6.800*105/	x+(2.994+1.873-2.0 356-0.895x-0.771- x+7.022 of maximum mome 1800=378 cm³/m	030)*x/1.873*1/2*x 2.434x ² +0.252x ³ nt. Therefore,	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S (i)	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x³-2.434x²+3.034x stress is zero at the point of 688x+3.034=0 40 tfm/m Section of Steel Sheet Pile Normal Condition Z=Mmax/sa=6.800*10 ⁵ / eismic Condition Z=Mmax/sa=8.040*10 ⁵ /	2+(2.994+1.873-2.0 356-0.895x-0.771- +7.022 of maximum mome 1800=378 cm ³ /m 2700=298 cm ³ /m	030)*x/1.873*1/2*x 2.434x ² +0.252x ³ nt. Therefore,	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S (i) (ii) Se	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x³-2.434x²+3.034x stress is zero at the point of 668x+3.034=0 40 tfin/m Section of Steel Sheet Pile Normal Condition Z=Mmax/sa=6.800*10 ⁵ / sismic Condition Z=Mmax/sa=8.040*10 ⁵ / the type of the steel sheet	2+(2.994+1.873-2.0 356-0.895x-0.771- +7.022 of maximum mome 1800=378 cm ³ /m 2700=298 cm ³ /m	030)*x/1.873*1/2*x 2.434x ² +0.252x ³ nt. Therefore,	Carles on Add Thirthe Carl Thirthe Carlo An Tallana (Add Thirthe Carlo	
The shear s dMmax/dx 0.504x²-4.8 x=0.670 Mmax=8.0 (4) Cross S (i) (ii) Se	-(2.994+1.873)*x*1/2*x 7.076x+9.149-3.147x-1. 0.252x³-2.434x²+3.034x stress is zero at the point of 6=0 868x+3.034=0 40 tfin/m Section of Steel Sheet Pile Normal Condition Z=Mmax/sa=6.800*10 ⁵ / sismic Condition Z=Mmax/sa=8.040*10 ⁵ / the type of the steel sheet	2+(2.994+1.873-2.0 356-0.895x-0.771- +7.022 of maximum mome 1800=378 cm ³ /m 2700=298 cm ³ /m	030)*x/1.873*1/2*x 2.434x ² +0.252x ³ nt. Therefore,	Carles on Add Thirthe Carl Thirthe Carlo An Talland (Add Thirthe Carlo	

T; tensile load of tie rod (tf)

Ap; reaction of tie rod (tf/m)

L; inerval of tie rod (m) (l=1.6m)

Normal Condition

T=4.416*1.6=7.07 tf

Seismic Condition

T=5.459*1.6=8.73 tf

(2) Cross Section of Tie Rod

 $d = sqr(4T/\pi\sigma a)$

A: cross section of tie rod (cm²)

T: tensile load of tie rod (tf)

σa: allowable stress (kg/cm²)

Normal Condition

D=(4*7.07*10³/3.14/900)^(1/2)=3.16 cm

Scismic Condition

D=(4*8.73*10³/3.14/1400)^(1/2)=2.82 cm

Name of Structure STEEL SHEET PILE Category Calculation Structural Calculation Page 12/12

7.2.6.2 Reinforcing Beam

(1) Bending Moment

M=T1/4

M: design moment (tfm)

T: tensile load of rod (tf)

L: interval of tie rod (m) (l=1.6m)

Normal Condition

M=7.07*1.6/4=2.83 tfm

Seismic Condition

M=8.73*1.6/4=3.49 tfm

(2) Cross Section of Beam
 Z=M/σa
 Z: cross section coefficient (cm³/m)
 σa: allowable stress (kgf/cm²)

Normal Condition

Z=2.83*10⁵/1400=202 cm³

Seismic Condition

Z=3.49*10⁵/2100=166 cm³

7.2.6.3 Check of Water tightness

L1/h1>=F

F = safety factor (3.0)

L1; seepage length (m)

Fs=(3.69*2+3.2)/(0.375+2.435)=10.58/2.81=3.77>3.0

Steel sheet plate

Tie rod

Type-III Ø35

- 2.1 Asin Pumping Station
- 2.1.8 Structural Calculation of Concrete Sheet Pile

	CRETE ET PILE		Pategory alculation		tabilit; nalysi		P	age	1/	4
Design of Concrete St	reet Pile									_
Stability analysis of co			aa mada aa f	-11 _{0.11}		ing Pagkin	.,-,.	10	+-* ,	
and the second of the second o		A STATE OF THE STA			3,		•		. **	٠.
Earth Pressure Coefic	• • • • • • • • • • • • • • • • • • • •		0.41kg/cm2)						
		Passive				1.4				
Normal	0.42	1.840			4	. 1,.				
Seismic	0.53	2.065			5.3	i Taran Kanana			Est.	
Safety Factor						*	-1.			
Normal	1.20			i eserin K	in the gr	ing the state of t	ra arii. Pr			•
Seimic	1.00									4
Boundary Condition			Marajan Katala						····	1
River	Locati	River Bed	Dike Top	allo	HI	Н2	H	SF(N)	SF(E)	
	on	Elevation	_Elevation_	wanc				()		
Semaramg River	No.30	m -2.4	m 1.1	m 0.5	m 4	m 8	m 12.0	1.39	1.24	
Asin Retarding Pond	east	-2.7	1.1	0	3.8		12.0			÷
Asin Pumping St. Com.1	all	-2.4	1.2	0.5	4.1		12.0	1.35		
Asin Pumping St. Com.2		-2.7	1.2	0	3.9	8.1	12.0	1.26	1.12	*
Asin Pumping St.	north	-2.4	-0.3	0.5	2.6	5.4	8.0	1.26	i	ĺ
Asin River 1	left	-3.7	0.3	0	4		12.0	1.39		
Asin River 2 Baru River 1	right left	-2.7	0.3	0	3.3	7		1.47		
Baru River 2	right	-2.4 -3.4	0.85 1.2	0	4.6		10.0 13.0	1.35 1.32		;
Baru Pumping St. Com.	all	-3.4	1.2	Ŏ	4.6		13.0	1.22		
Baru Pumping St.	north	-3.4	-0.3	0.5	3.6		11.0	1.38		
(1) 高级的复数形式设置的 (i)								4		:
	2 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5									
Normal Condition						Selfer Selfer			41.	
Concrete sheet pile (nor	entra de la companya						* 1 V } 			
Concrete sheet pile (nor	Ka=	0.42	w=	0.8						
Concrete sheet pile (nor phai= 22.5 c= 0.41	Ka= Kp=	0.42 1.84	q=	1	3 A L					
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b	Ka= Kp= ed -2.4m	0.42 1.84 , bank crow	q=	1	3 A L					
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m	Ka= Kp= ed -2.4m total=	0.42 1.84 , bank crow 12 m	q= /n +1.1m, allo	l owanc	e 0.5n	1)				
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m	Ka= Kp= ed -2.4m total=	0.42 1.84 , bank crow 12 m	q= /n +1.1m, allo	l owanc	e 0.5n	1)				
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P 24	Ka= Kp= ed -2.4m total=	0.42 1.84 bank crow 12 m	q= /n +1.1m, allo P P	1 owanc p 1 47 10	e 0.5n pc	n) P	T 53 14			
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P 24	Ka= Kp= ed -2.4m total=	0.42 1.84 bank crow 12 m	q= /n +1.1m, allo P P	1 owanc p 1 47 10	e 0.5n pc	n) P	T 53 14		,我就是我们的一个人,我们就是我们的人,我们就会会会的人,我们们的人们就会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会会	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS	Ka= Kp= ed -2.4m total= -4.13 -24.80	0.42 1.84 bank crow 12 m 7 5.04 PT 5.04 25. 30.24 102.	q= /n +1.1m, allo P P 10 21	1 owanc 1 1 47.10 125.61	pc 6.	n) P' .04 .09 1	T 53.14 41.70 1.39		《大学》 1987年 1	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed -	0.42 1.84 bank crow 12 m 7 5.04 25 30.24 102.	q= /n +1.1m, allo P P 10 21	1 owanc 1 1 47.10 125.61	pc 6.	n) P' .04 .09 1	T 53.14 41.70 1.39		《大学》,"我们在我们的时载要亲自的情况。" 人名英格兰 医二甲磺胺二苯酚 网络人名英格兰	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total=	0.42 1.84 bank crow 12 m 7 5.04 25 30.24 102. 2.7m, dike	q= /n +1.1m, allo P P 10 21 crown +1.1m	1 powance 1 47.10 125.61	e 0.5n pc 6 16.	n) P' .04 .09 1 +0.0n	T 53.14 41.7(1.39		《大学》,"我们不是我们都要亲心,我们是这个人,我们还是我们的人,我们是我们的人,我们们是我们的人,我们们就是一个人,我们们就是一个人,我们就是这个人,我们就是这个人,我们就是这个人,我们就是这个人,	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total=	0.42 1.84 bank crow 12 m 7 5.04 25 30.24 102. 2.7m, dike	q= /n +1.1m, allo P P 10 21 crown +1.1m	1 powance 1 47.10 125.61	e 0.5n pc 6 16.	n) P' .04 .09 1 +0.0n	T 53.14 41.7(1.39		人名英格兰 化二苯甲酚甲酰胺毒素 计等级电话 建筑 建筑 化苯二甲酰胺 化苯二甲酰胺 化苯二甲酰胺 化苯苯二甲苯苯二甲苯苯	
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Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m P1 p P	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total=	0.42 1.84 bank crow 12 m 7 5.04 25 30.24 102 2.7m, dike 11 m 1 PT 4.62 21,	q= 'n +1.1m, allo P 10 21 crown +1.1m P 16 55	1 powance 47.10 125.61 n, allow 1 38.15	pc 6 16 vance	n) P'.04 	Γ 53.14 41.7(1.39 a) Γ 43.59	を 関係 関係 対象 対象 対象 対象 対象 対象 対象 対象 対象 対象	《大学》,1997年,1997年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m P1 p P	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total=	0.42 1.84 bank crow 12 m 7 5.04 25 30.24 102 2.7m, dike 11 m 1 PT 4.62 21,	q= 'n +1.1m, allo P 10 21 crown +1.1m P 16 55	1 powance 47.10 125.61 n, allow 1 38.15	pc 6 16 vance	n) P'.04 	Γ 53.14 41.7(1.39 a) Γ 43.59		《大学》,1997年,1997年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年,1998年	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m P1 p P 20 M 76 FS Asin Pumping Station C	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total= -3.79 -21.22	0.42 1.84 bank crow 12 m 7 PT 5.04 25 30.24 102 2.7m. dike 11 m 4.62 21 25.87 80 (bed =-2.4)	q= 'n +1.1m, allo 'p P 10 21 crown +1.1m P 16 55	1 cowance 47.10 125.61 1, allow 1 38.15 91.57	pc 6 16.	n) P .04	T 53.14 41.70 1.39 a) F 43.59 04.61 1.30		《大····································	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m P1 p P 20 M 76 FS Asin Pumping Station C D= 4.1 m	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total= -3.79 -21.22	0.42 1.84 bank crow 12 m 7 5.04 25 30.24 102 2.7m. dike 11 m 1 A62 21 25.87 80 (bed = 2.4)	q= 'n +1.1m, allo 'p P 10 21 crown +1.1m P 16 55	1 cowance 47.10 125.61 1, allow 1 38.15 91.57	pc 6 16.	n) P .04	T 53.14 41.70 1.39 a) F 43.59 04.61 1.30		人名 计分词 化分子 医乳球数多素 计多位式 电空运管 医线性性 医外外性 医外外性 医二种结合 化二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十	
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Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m P1 p P 20 M 76 FS Asin Pumping Station C D= 4.1 m h= 7.9 m	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total= -3.79 -21.22 omplex 1 total=	0.42 1.84 bank crow 12 m 7 PT 5.04 25 30.24 102 2.7m, dike 11 m 4.62 21 25.87 80 (bed =-2.4)	q= 'n +1.1m, allo 'P P 10 21 crown +1.1m P 16 55	1 owanc 1 47.10 125.61 1, allow 2 1 38.15 91.57	pc 6. 16. vance pc 5. 13. m, all	n) P.04 09 1 H0.0n P.43 04 1	Τ 53.14 41.70 1.39 α) Γ 43.59 04.61 1.30 nce 0.)	人名 计分词 地名美国凯拉拉多克 计多位式记录系统 化双角电话 医骨髓性 建二氯化甲基酚 医甲基酚 医甲基磺胺二甲基酚 医克克斯氏管 医克克斯氏管 医克克斯氏管 医克克斯氏管 医克克斯氏管	
Concrete sheet pile (nor phai= 22.5 c= 0.41 Semarang River(river b D= 4 m h= 8 m Pa P1 p P 24 M 97 FS Asin Retarding Pond (ri D= 3.8 m h= 7.2 m P1 p P 20 M 76 FS Asin Pumping Station C D= 4.1 m h= 7.9 m	Ka= Kp= ed -2.4m total= -4.13 -24.80 ver bed - total= -3.79 -21.22 omplex 1 total=	0.42 1.84 bank crow 12 m 7 PT 5.04 25 30.24 102 2.7m, dike 11 m 4.62 21 25.87 80 (bed =-2.4)	q= 'n +1.1m, allo 'p P 10 21 crown +1.1m P 16 55	1 owanc 1 47.10 125.61 1, allow 2 1 38.15 91.57	pc 6. 16. vance pc 5. 13. m, all	n) P.04 09 1 H0.0n P.43 04 1	Τ 53.14 41.70 1.39 α) Γ 43.59 04.61 1.30 nce 0.)	人名 计分词 化分子 计记忆数据表示 使某人 的复数医感染性 化环烷醇医环糖 建筑 计可以转换 化二甲基苯酚 医二甲基苯酚 医二甲基基苯酚 计分词 计记录器 计记录器	

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Name of
                  CONCRETE
                                          Category
                                                            Stability
                                                                             Page
                                                                                         2/4
  Structure
                   SHEET PILE 1000
                                         Calculation
                                                            Analysis
                                                               5.精神 1. affit
Asin Pumping Station Complex 2 (bed =-2.7m, dike crown +1.2m, allowance 0.0
   D = 3.9
                  total= 11 m
   h=7.1
               Pa
                                                       Po
                   pc pq PT P1 pc PT 20 -3.788 4.62 21.16 37.10 5.36 42.46 75 -21.03 25.64 79.83 87.81 12.68 100.48
               Ρl
      M
Asin Pumping Station (bed =-2.4m, dike crown -0.3m, allowance 0.5m)
  D= 2.6 m
h= 5.4 m
                   total= 8 m
              Pa
                                                       Pp
                                                  P1 pc PT
21.46 4.07 25.54
38.63 7.33 45.96
                 pc pq PT
11 -2.755 3,36 11,36
34 -12.95 15.79 36.53
                                                                          1.26
Asin River 1 (bed =-3.7 m, dike crown 0.3m, allowance 0.0m)
   4 m
h= 8 m
                  total= 12 m
  D= 4
                                                    Pp
Pl pc
              Pa
              P1 pc pq PT 24 -4.133 5.04 25.10 97 -24.8 30.24 102.21
                                                   47.10 6.04 53.14
125.61 16.09 141.70
Asin River 2 (bed = 2.7 m, dike crown 0.3m, allowance 0.0m)
  D= 3 m total= 10 m
h= 7 m
              Pa
                                                  Pp
P1 pc PT
36.06 5.28 41.34
84.15 12.32 96.47
              P1 pc pq PT
17 -3.444 4.20 17.56
62 -18.94 23.10 65.76
      M
      FS
Baru River 1 (bed =-2.4 m, dike crown 0.85m, allowance 0.0m)
  D= 3.25 m total= 10 m
   h = 6.75
             m
               Pa
                   pv pq PT P1 pc PT 17 -3.444 4.20 17.56 33.53 5.09 38.63 60 -18.51 22.58 64.26 75.45 11.46 86 00
                                                       Po
Baru River 2 (bed = 3.4 m, dike crown 1.2m, allowance 0.0m)
                  total= 13 m
  D= 4.6
h= 8.4
             m
              m
                                                      Pp
              Pa
                                                     P1 pc PT 51.93 6.34 58.27
                  pc pq PT
28 -4.477 5.46 29.37
117 -27.76 33.85 123.45
      M
                                                    145.41 17.74 163.15
Baru Pumping Station Complex(bed = 3.7 m, dike crown 1.2m, allowance 0.0m)
  D= 4.9
h= 8.1
                    total= 13 m
              m
              m.
                                                         कियो रिक्षाहरूके महीत कर
              Pa
                                                       Pp
                   pc pq PT
28 -4.477 5.46 29.37
                                                     P1 pc PT 48.29 6.11 54.40
      р
                  115 -27.09 : 33.03 120.46
      M
                                                      130.38 16.50 146.88
      FS
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Name of
                 CONCRETE
                                         Category
                                                          Stability
                                                                          Page
                                                                                      3/4
   Structure
                  SHEET PILE
                                        Calculation
                                                          Analysis
                                                      Standard State Committee
Baru Pumping Station (bed == 3.4 m, dike crown 0.3m, allowance 0.5m)
   D=3.6
                       total= 11 m
              m
   h≕
       7.4
              m
              Pa
                                                   ⊡ Pp
                 pc pq PT
20 -3.788 4.62 21.16
77 -21.59 26.33 81.99
                                                            pc PT
                                                     P1 1
       P
                                                  40.30 5.58 45.89
      M
                                                       99.41 13.77 113.19
       FS
Seismic Condition
Concrete sheet pile (seismic condition)
  vhai= 22.5
                          Ka = 0.53
                                                        0.8
    c= 0.41 Kp= 2.07
Semarang River(river bed -2.4m, bank crown +1.1m, allowance 0.5m)
               m total= 12 m
    D= -4
                                               Pp .
               Pa 🗆
              P1 pc pq PT P1 pc PT

31 -5.22 6.36 31.67 52.99 6.79 59.78

122 -31.29 38.16 128.98 141.31 18.11 159.42
                                                                   1.24
                                          Barthalest Carlot State (
Asin Retarding Pond (river bed -2.7m, dike crown +1.1m, allowance+0.0m)
   D= 3.8
                                11
               m total=
    h= 7.2
               m
               Pa
                                                   \sim 1 P_{\rm D} \sim 10
              Pa
Pl pc pq PT Pl pc PT
26 -4.78 5.83 26.70 42.92 6.11 49.03
96 -26.77 32.65 101.64 103.02 14.67 117.68
Asin Pumping Station Complex 1 (bed = 2.4m, dike crown +1.2m, allowance 0.5m
   D= 4.1 \text{ m} \text{ total}= 12
    h= 7.9
               m
                                                      Po
               Pl pc pq PT Pl pc PT

31 -5.215 6.36 31.67 51.68 6.70 58.38

121 -31.03 37.84 127.91 136.08 17.66 153.73
                       Asin Pumping Station Complex 2 (bed = 2.7m, dike crown +1.2m, allowance 0.0n
   D = 3.9
                     total= 11 m
    h = 17.1
               m
                                                 Pp
              Pa
P1 pc pq PT P1 pc PT
26 4.781 5.83 26.70 41.74 6.03 47.77
95 -26.53 32.36 100.74 98.78 14.26 113.04
Asin Pumping Station (bed = 2.4m, dike crown -0.3m, allowance 0.5m)
   D=2.6
               m
                    total= 8
    h= 5.4
              m
                   pc pq PT P1 pc PT 14 -3.477 4.24 14.33 24.14 4.58 28.73 24.24 19.93 46.10 43.46 8.25 51.71 1.12
               Pa
                  43 -16.34 19.93 46.10
       M
       FS
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Name of
                                                 CONCRETE
                                                                                                                                                               Stability
                                                                                                                Category
                                                                                                                                                                                                         Page
                                                                                                                                                                                                                                         4/4
        Structure
                                                   SHEET PILE
                                                                                                              Calculation
                                                                                                                                                               Analysis
 Asin River 1 (bed =-3.7 m, dike crown 0.3m, allowance 0.0m)
           D= 4
                                          \mathbf{m} total= 12 \mathbf{m} \mathbf{m}
            h=
                             8
                                           m
                                          Pa
                                                                               po PT
                                                                                                                                                     Pl pc PT
                                                           - pc
                                                       31 -5.215 6.36 31.67
                                                                                                                                                   52.99 6.79 59.78
                                                    122 -31.29 38.16 128.98
                     M
                                                                                                                                                     141.31 18.11 159.42
Asin River 2 (bed =-2.7 m, dike crown 0.3m, allowance 0.0m)
                                                               total≕ 10 m
                                         m
            h=
                                          m
                                          Pa
                                                                                                                                                   Pp
                                                                                                                                                    Pl pc PT
                                                             pc pg PT
                                                       21 -4.346 5.30 22.15
                                                                                                                                                   40.57 5.94 46.51
94.67 13.86 108.53
                                                       78 -23.9 29.15 82.98
                     FS
                                                                                                                                                                                                   1.31
Baru River 1 (bed =-2.4 m, dike crown 0.85m, allowance 0.0m)
          D= 3.25 m
h= 6.75 m
                                                          total= ... 10 · m ...; ; ...; · ... ; · ... ; · ... ; · ...
                                                                                                                                          Pp
P1 pc PT
37.73 5.73 43.45
84.88 12.89 97.77
                                          Pa
                                           Pa
P1 pc pq PT
21 -4.346 5.30 22.15
76 -23.36 28.49 81.09
                    M
Baru River 2 (bed =-3.4 m, dike crown 1.2m, allowance 0.0m)
          D=4.6 m total= ... 13 m
           h=8.4 m
                                       Pa
                                          Pl pc pq PT Pl pc PT 36 -5.65 6.89 37.07 58.42 7.13 65.55 148 -35.03 42.72 155.78 163.59 19.96 183.55
Baru Pumping Station Complex(bed =-3.7 m. dike crown 1.2m, allowance 0.0m)
          D=\begin{bmatrix} 4.9 \end{bmatrix} \text{ m} \quad \text{total}= \{13 \quad \text{m} \quad \text{sign}_{2,2}, \text{ and sign}_{2,2}, \text{ and s
           h= 8.1
                                         m
                                                                                                                                                Po
Pl pc PT
54.33 6.87 61.20
146.68 18.56 165.24
                                      · Pa
                                         P1 pc pq PT 36 -5.65 6.89 37.07 145 -34.18 41.68 152.01
Baru Pumping Station (bed =-3.4 m, dike crown -0.3m, allowance 0.5m)
          D=3.6
                                        \mathbf{m} \cdot \mathbf{m} = \mathbf{total} = \mathbf{11} \cdot \mathbf{m} = \mathbf{11} \cdot \mathbf{m}
           h= 7.4
                                         m
                                                                                                                                          Pp
Pl pc PT
45.34 6.28 51.62
111.84 15.49 127.33
                                          Pa
                                           Pa
P1 pc pq PT
26 -4.781 5.83 26.70
97 -27.25 33.23 103.46
                                                                                                                                                1.23 (1.23)
```

- 2.1 Asin Pumping Station
- 2.1.9 Seepage Analysis

Name of	Sheet Pile	Category of	Seepage Analysis	Page	1/1
Structure	For Seepage Control	calculation			

Seepage Control Analysis

(1) Asin Pumping Station

The length of steel sheet pile for seepage control is the same as the gate foundation. L=5.0m

(2) Asin Retarding Pond

Required length of sheet pile is calculated by using Lane's formula as follows

C<(L/3+21)/H)

Where; C=8.5 (very fine sand or silt)

H=+0.25-(-2.5)=2.75 m (M.H.W.L of the sea-Pond D.L.W.L)

L=16.8m (bottom width of dike)

Therefore,

l> 8.9 m

The total length of the concrete sheet pile is

L=8.9+3.8=12.7-----13.0m

- 2.1 Asin Pumping Station
- 2.1.10 Alignment Calculation of Asin River

Name of Structure	Asin Rive	r ,	Category of calculation	Allgment	Page	1/2
· .	·					
		-				
		Acc. Dis 90,554	90.554 400.531 400.531 856.327 856.327 1.184.498 1.208.462 1.208.462			
		90.554	309.977 455.706 328.171 23.964			
		ฮ				
		TL				
			179.29			
	RIVER		276.25 179.20 97.03 276.71			
	ASIN RIV	α 95.07	276.95 96.23 277.03 96.71			
	Ä	DISTANCE 90.554	·			
		~				
			434,853.5 434,903.0 434,945.2 434,946.0			
		N 9,231,172.0	9,250,774,1 9,250,321.0 9,229,995.3 9,229,995.3			
		1P 1P3/BPA	IPA2 IPA3 IPA4 EPA			
		DRAW NO.				

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No. Pr N E R DISTANCE C C C C C C C C C	Name of Structure	Asin Riv	er		Category of calculation	Allgment	Page	2/2
P								
Page National Property Page P		•			3.238			
P			Acc. Dis	15.495	98.792 115.753 115.753 194.096 194.096			
N				15.495	66.498 16.961 65.423 14.297 (1.377)			
PP			B	-16.790	7516,9617 (314,297			
PP		4	72		Sic. 8, 502.			
PE N E R DISTANCE			F	8.726				
P		VERT	8		1 1 1 1 1 1 1 1			
P		× cur						
P		08 N]			
IP N E R BPCA 9,229,981.1 434,948.6 IPCA1 9,229,881.3 434,977.0 90 IPCA2 9,229,881.3 434,977.0 90 IPCA3 9,229,802.9 435,010.2 6 IPCA 9,229,804.2 435,010.2 EPCA 9,209,804.2 EPCA 9,209,80		A S	TANCE		<u> </u>			
IP N BPCA 9,229,981.1 IPCA1 9,229,881.3 IPCA3 9,229,881.3 IPCA3 9,229,804.2 EPCA 9,229,804.2 S/16/98 10:24				25	1, 1908			
BPCA BPCA BPCA BPCA BPCA BPCA BPCA BPCA			ω	434,948.6	434,977.0			
BPCA BPCA BPCA BPCA BPCA BPCA BPCA BPCA			z	9,229,981.1	9,229,881.3 9,229,802.9 9,229,804.2	716/98 10:24		
			â	BPCA IPCA1	PCA2 PCA3 EPCA			
			DRAW NO.					