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PROPOSED DESIGN MAIN CANAL - Sibalaya

Gumbasa Irrigation Project

Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation Systems and its Facilities, Palu and Sigi Districts, Central Sulawesi Province.

January 2021

ID ADB Gumbasa Irrigation

Agenda

1. Introduction
2. General principle for developing solution
3. Developed solution
4. Discussion

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PROJECT LOCATION

Project located at **South Sibalaya Village**. Tanambulava sub-district, Sigi Regency, Central Sulawesi, Indonesia.

Coordinate:
Longitude -1.147978°
Latitude 119.924867°

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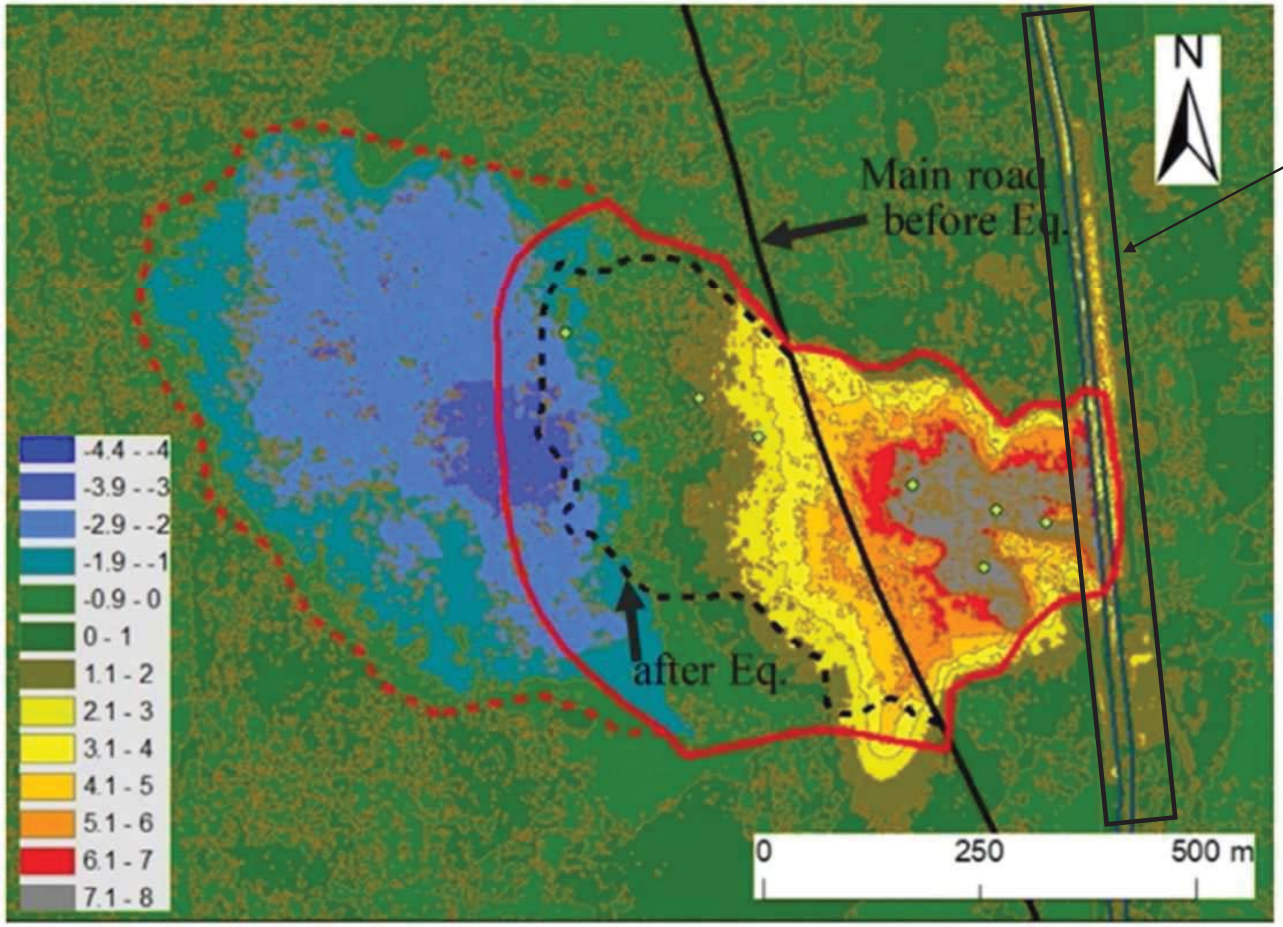
PROJECT LOCATION



Probable full extent of remediation (to be confirmed)

Figure 4: Contours of change in elevation (in metres) at Sibalaya [c]

Source:
(c) Okamura, M., Ono, K., Arsyad, A., Minaka, U.S., Nurdin, S. (2020) Large-scale flowslide in Sibalaya caused by the 2018 Sulawesi earthquake. Soils and Foundations (60): 1050-1063

What actually happened ?

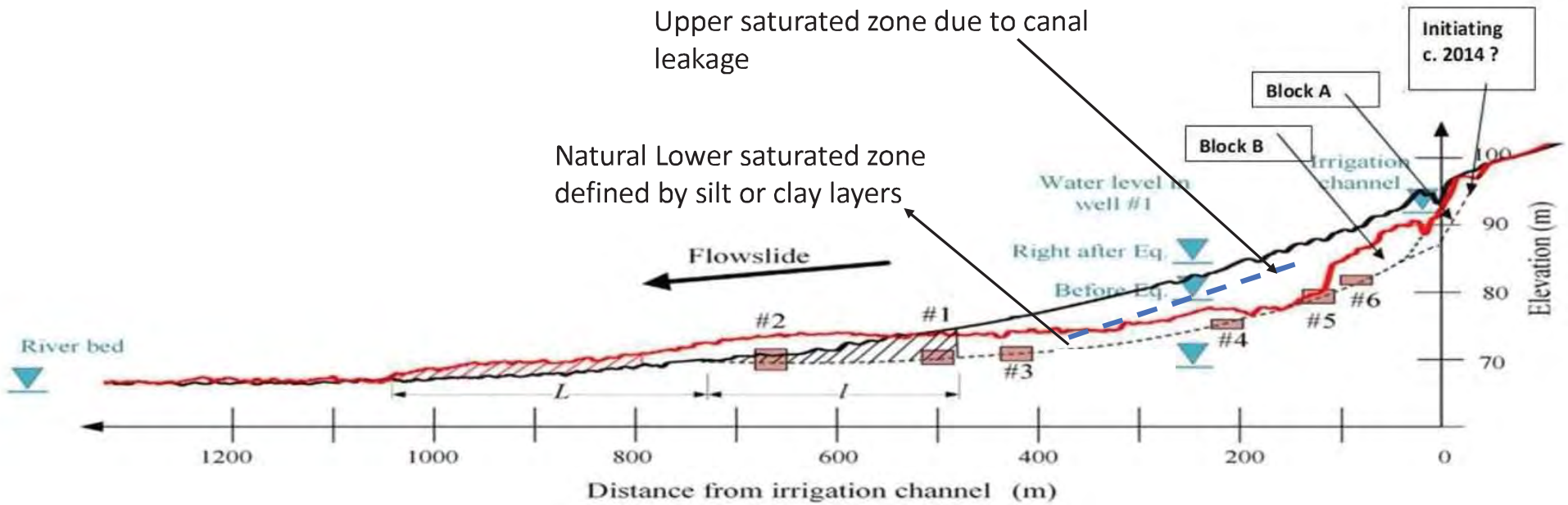


Figure before and after the earthquake together with highly sheared depths detected in trenches (Okamura eta al. 2020).

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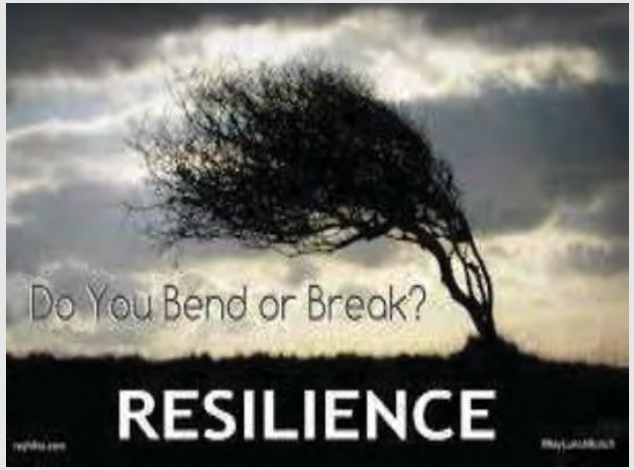
What actually happened ?

- The Sibalaya slip is very complex, and appears to have resulted from a catastrophic loss of strength on a 10 m deep or so shear plane, with sudden drop in ground just after shaking finished, and so not straightforward liquefaction alone.
- Canal leakage was likely a factor as was trapped groundwater pressure generated during the event.
- These flows were most likely *only* happening because of long term canal leakage (the one flow site without canal is sat directly at the main strike slip fault and was closest to the epicentre, and so acceleration levels were likely much more intense and it is reported that slope angle was the greatest of all sites, and so if a naturally high water table and right soil condition then flow can be explained for that situation).
- Future earthquakes may well dislodge Blocks A and B, further undermining the canal.

Key Strategy for developing solution

- The prime objective is presumably to get the canal back operational in a short time frame and at reasonable cost.
- The canal should have an affordable resilience to future earthquake and ground movements
- Any solution developed should focus on **Resistance** and **Resilience** and stabilise ground downslope of the existing canal so as to limit risk of future lateral movement in future earth tremors.



Resilience: the ability of assets, networks and systems to anticipate, absorb, adapt to and / or rapidly recover from a disruptive even

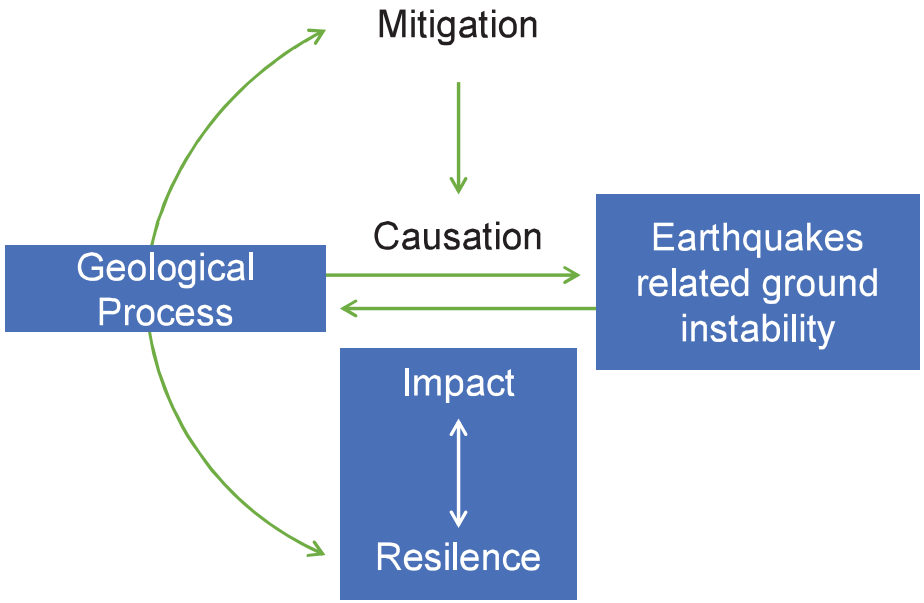
Resilience: Addressing both Adaptation and Mitigation

And how they relate

Mitigation is about avoiding the impacts of future earthquake through developing resistance in the system

Mutually Reinforcing

Resilience is about responding to the future impacts of earthquake risk, in the shortest possible time



Need for well defined Performance Objectives

- The canal shall be considered as critical infrastructure bordering on lifeline structure
- The canal does not support any fire fighting efforts
- Important to limit future leakage from the canal to lowest practical level.
- The canal shall be designed for SLS and ULS criteria.
- For SLS case – Serviceable & Operational , recoverable in days
- For ULS case – controllable damage, Repairable, recovery in months

Ground Motion Level	Approximate Magnitude	Approximate Average Return Period	Performance Objective
SLS	Occasional, Mag 6, PGA 0.25g-0.35g	5-10 years	Serviceable & Operational
ULS	Mag 7.5, PGA =0.5g – 0.75g	200 – 475 yrs	controllable damage, Repairable,

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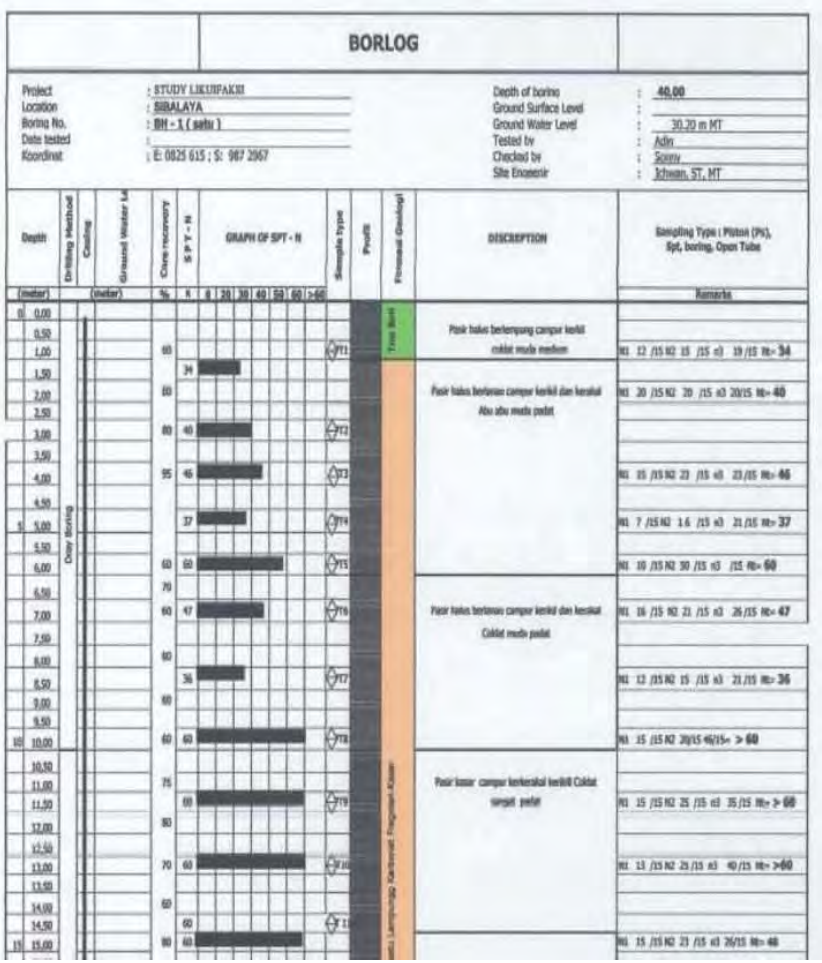
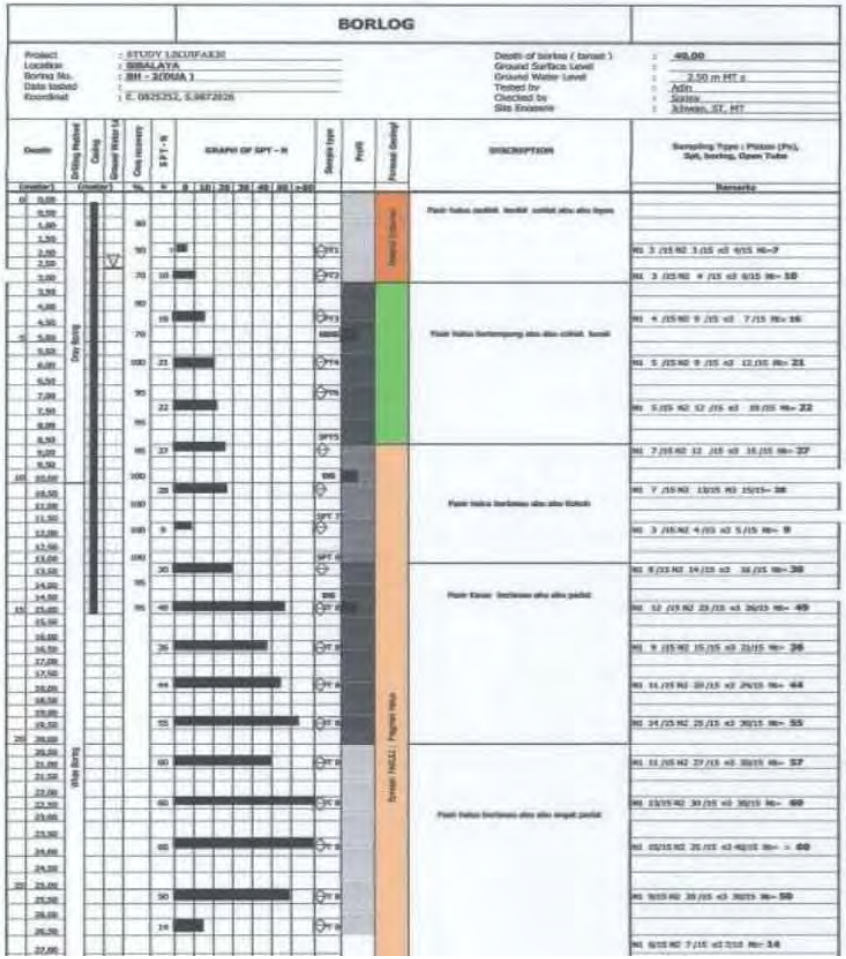
GEOTECHNICAL DATA

Reference:
Presentation Data of Geological, Geotechnical, Geomorphological and Geohydrological and Survey Plan of Sibalaya Liquefaction Zone
Presentation Parit Uji (Trenching) Petobo dan MASW Sibalaya

GEOTECHNICAL DATA



BORELOG 1



BORELOG 2

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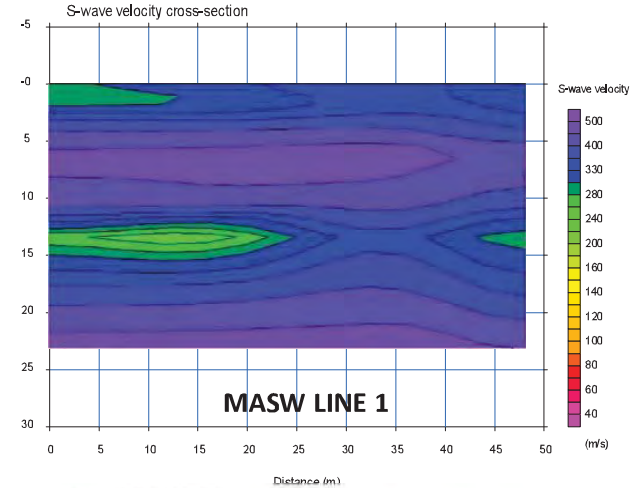
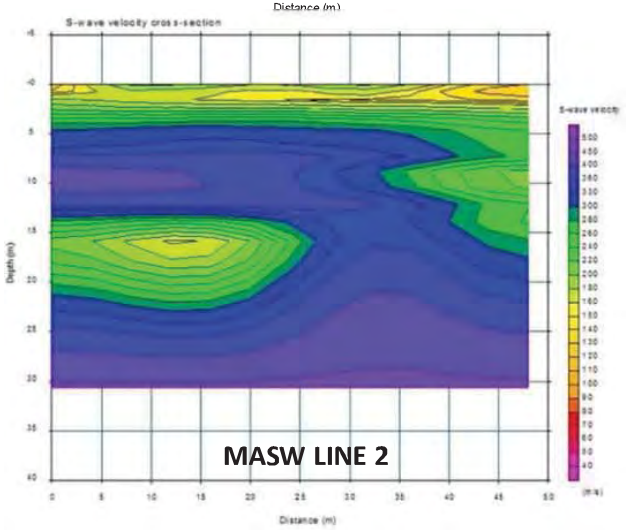
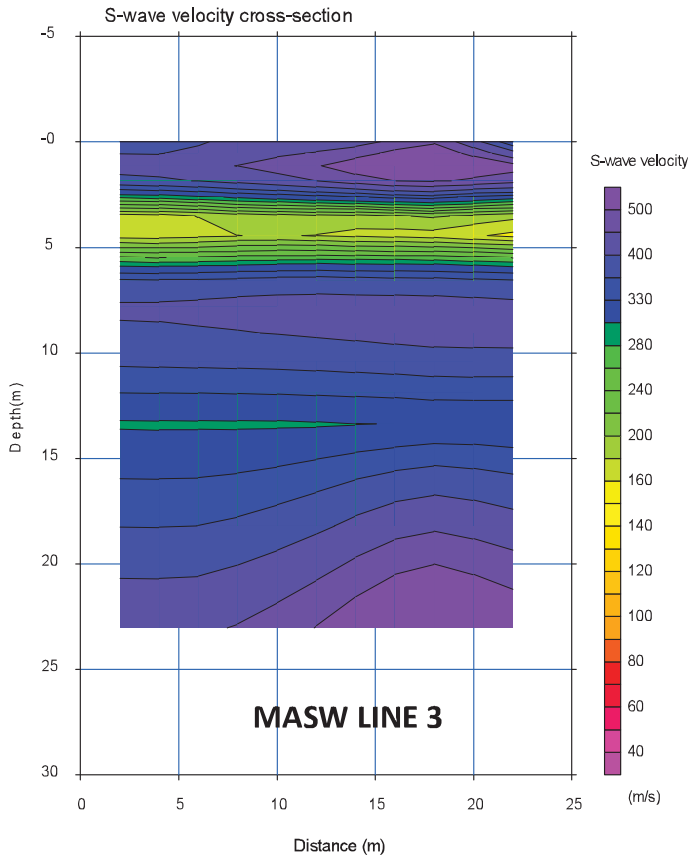
GEOTECHNICAL DATA







The design life of the structure

Peruntukan	Umur rencana (tahun)	Probabilitas terlampaui (%)	Periode ulang (tahun)	Kriteria keamanan	Referensi
Bangunan gedung dan non-gedung	50	2	2.500	-	SNI 1726:2012
Jembatan konvensional	75	7	1.000	-	SNI 2833:201x AASHTO (2012)
Dinding penahan Abutmen Jembatan	75	7	1.000	FK>1,5 (terhadap geser saat mengalami beban statik) FK>2 (terhadap guling saat mengalami beban statik) FK>1,1 (terhadap beban pseudostatik)	WSDOT, FHWA-NJ-2005-002
Timbunan oprit				FK>1,1	
Bendungan	100 100	1 50	10.000, *Safety Evaluation Earthquake* (SEE) 145 *Operating Basis Earthquake* (OBE)	• Tidak terjadi aliran air yang tidak terkendali • Deformasi tidak melebihi 0,5 dari tinggi jagaan • Deformasi pada filter tidak boleh melebihi 0,5 tebal filter • *Spillway* tetap berfungsi setelah terjadi gempa rencana Kerusakan minor setelah terjadi gempa rencana	ICOLD No 148, 2016,
Bangunan pelengkap bendungan	50	2	2500	-	
Terowongan	100	10	1.000 tahun		

Source: SNI 8460 - 2017

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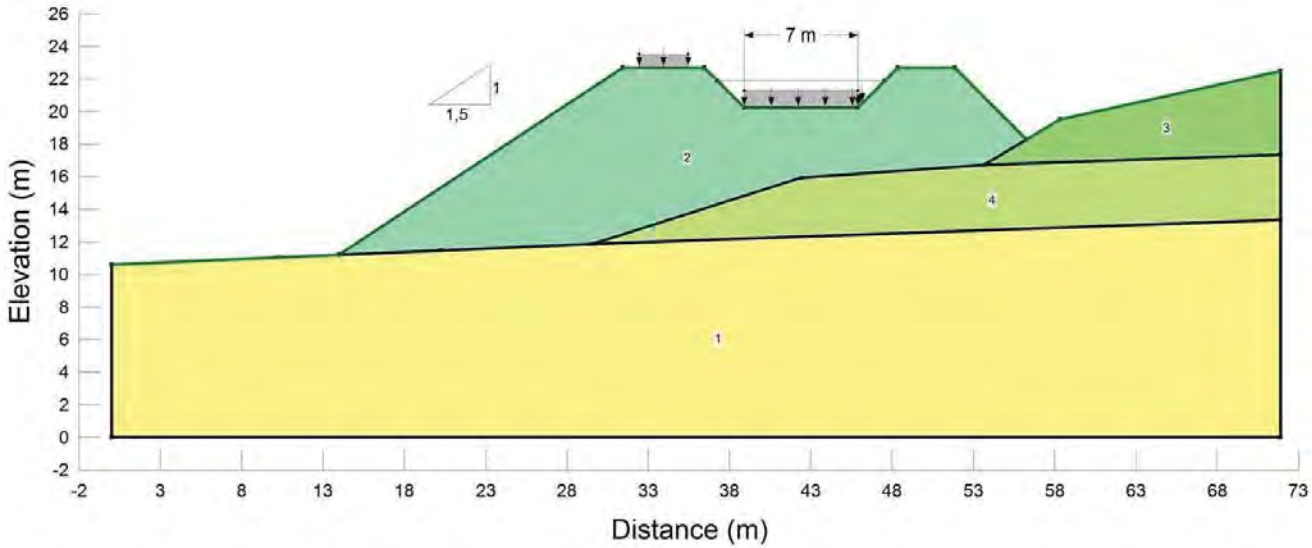
GEOTECHNICAL PARAMETER



Geotechnical Parameter

Color	Name	Model	Unit Weight (kN/m³)	Cohesion' (kPa)	Phi' (°)	Phi-B (°)	Constant Unit Wt. Above Water Table (kN/m³)
	Backfill	Mohr-Coulomb	19	0	35	0	20
	Gravely Sand (very dense)	Mohr-Coulomb	18	0	34	0	20
	Silty Sand (Medium, Brown)	Mohr-Coulomb	17	0	32	0	18
	Silty Sand (Medium, Grey)	Mohr-Coulomb	17	0	30	0	18

Note:

Geotechnical parameter determine by using corellation with previous geotehnical data. And had been summarized in the document **Gumbasa Irrigation Project – Internal Preliminary Geotechnical Parameters.**

DESIGN CRITERIA

Slope Stability Requirements for Static Condition

Cost and consequences of slope failure	Uncertainty Analysis	
	Low[a]	Height[b]
Repair costs are worth the additional costs to design a more conservative slope.	1,25	1,5
Repair costs are greater than additional costs to design a more conservative slope.	1,5	≥2,0

[a] The level of uncertainty in the analysis conditions is categorized as low, if geological conditions can be understood, uniform ground conditions, consistent soil investigation, complete and logical to conditions in the field.

[b] The level of uncertainty in the analysis conditions is categorized as high, if the geological conditions are very high complex, varied soil conditions, and inconsistent and inconsistent soil investigations dependable.

Slope Stability Requirements for Seismic Condition

Method	FS	Note
Limit equilibrium methods	> 1,1	Kh = 0,5ac
Displacement-based	Displacement <4 inch*	

Reference:
SNI 8460-2017 Chapter 7.5
* NCHRP Report 611 Chapter 3.2.1

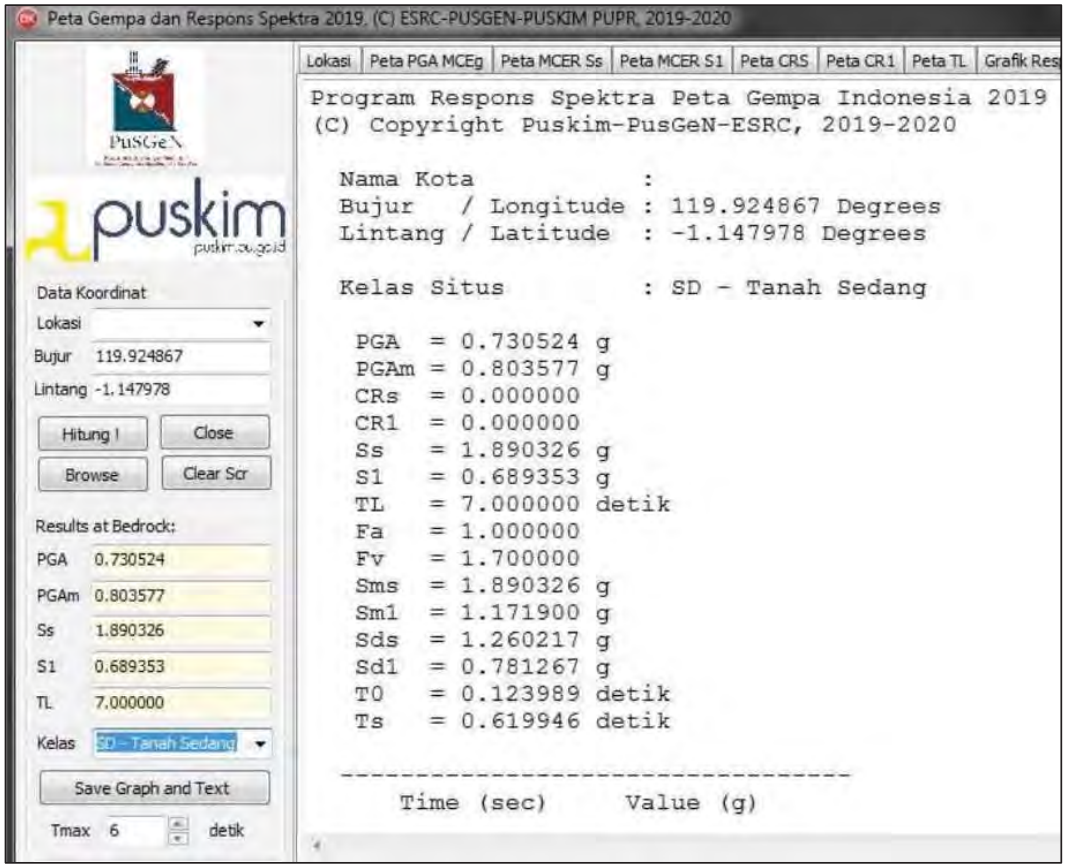
Load Criteria for Slope

- Surcharge load = 10 kPa
- Seismic Load:
  Peak Ground Acceleration 2% exceedance in 50 years (site class and amplification)

Wall Stability Requirements

Stability Requirement	FS minimum
Overturning	2
Sliding	1,5
Bearing Capacity Failure	3
Global/Deep-seated failure	1,5
Earthquake	1,1
Reference: SNI 8460-2017 Chapter 10.2.5.3	

SEISMIC CRITERIA



Peak Ground Acceleration 2% exceedance in 50 years
Ref: SNI 1726-2019

Seismic Coefficient for Slope Stability Analysis

$PGA = 0{,}730524\ g_e$

$S_s = 1{,}890326\ g_e$

$S_1 = 0{,}689353\ g_e$

$F_{PGA} = 1{,}1$

$F_v = 1{,}7$

$$\beta = \frac{F_v \cdot S_1}{F_{PGA} \cdot PGA} = 1{,}4584$$

$$H_s = \frac{11{,}2}{0{,}3} = 37{,}3333$$ (Slope height in feet)

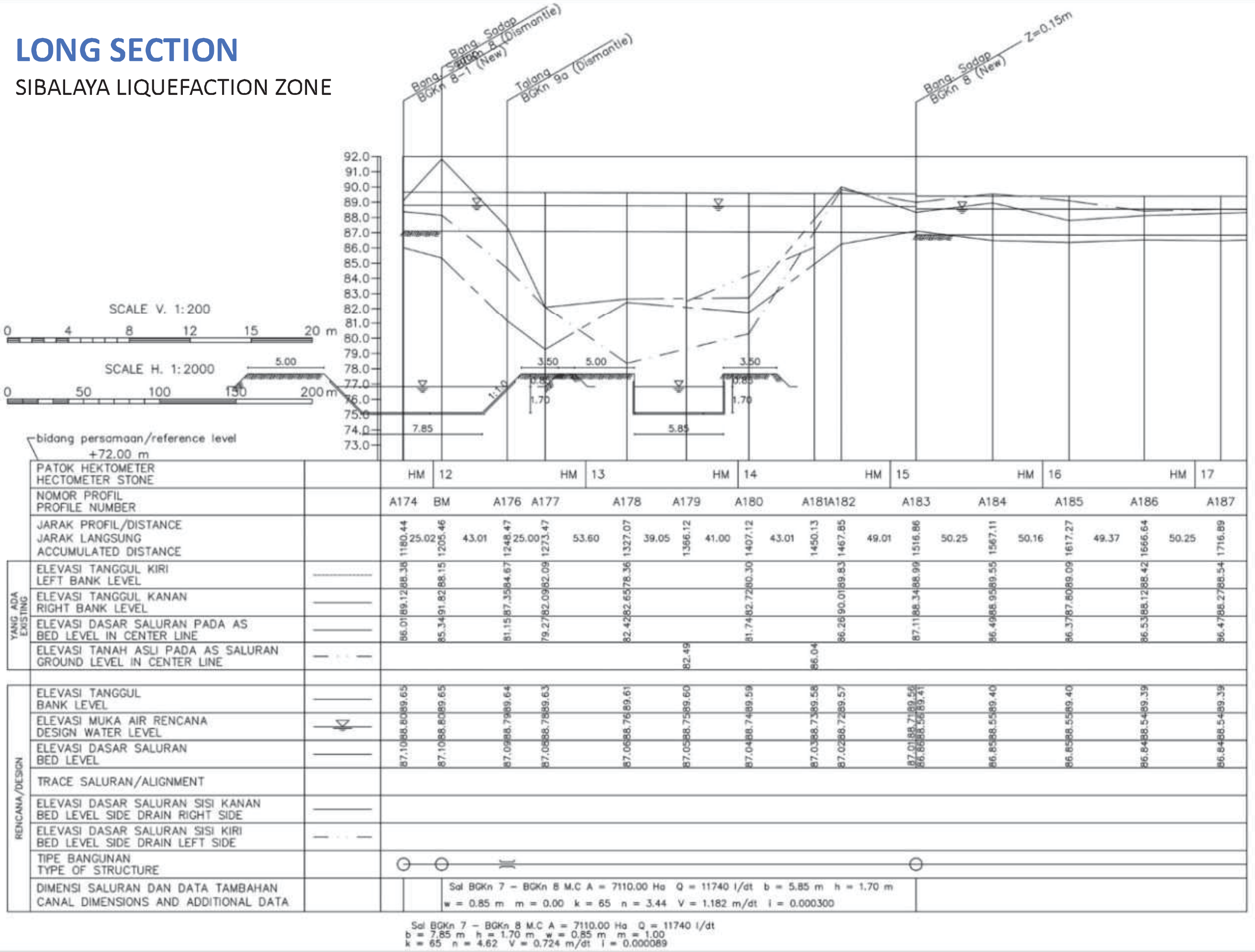
$$\alpha = 1 + 0{,}01 \cdot H_s \cdot (0{,}5 \cdot \beta - 1) = 0{,}8989$$

$$k_{av} = PGA \cdot F_{PGA} \cdot \alpha = 0{,}7223\ g_e$$

$$k_h = 0{,}5 \cdot k_{av} = 0{,}3612\ g_e$$

LONG SECTION

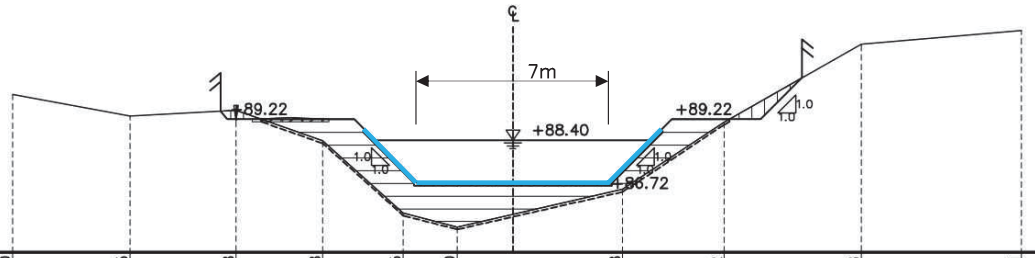
SIBALAYA LIQUEFACTION ZONE



CROSS SECTION

GALIAN	:	1.35 m²
TIMBUNAN	:	18.67 m²
KUPASAN	:	20.69 m
G. RUMPUT	:	5.03 m
BPT	:	22.88 m
CONCRETE	:	1.36 m²
GEO M.	:	13.38 m

reference level +84.00



GROUND LEVEL (m)		90.20	89.35	89.58	88.38	85.55	85.00	86.48	89.12	92.18	92.71	
DISTANCE (m)			4.61	4.18	3.41	3.17	2.13	6.51	4.00	5.40	6.30	

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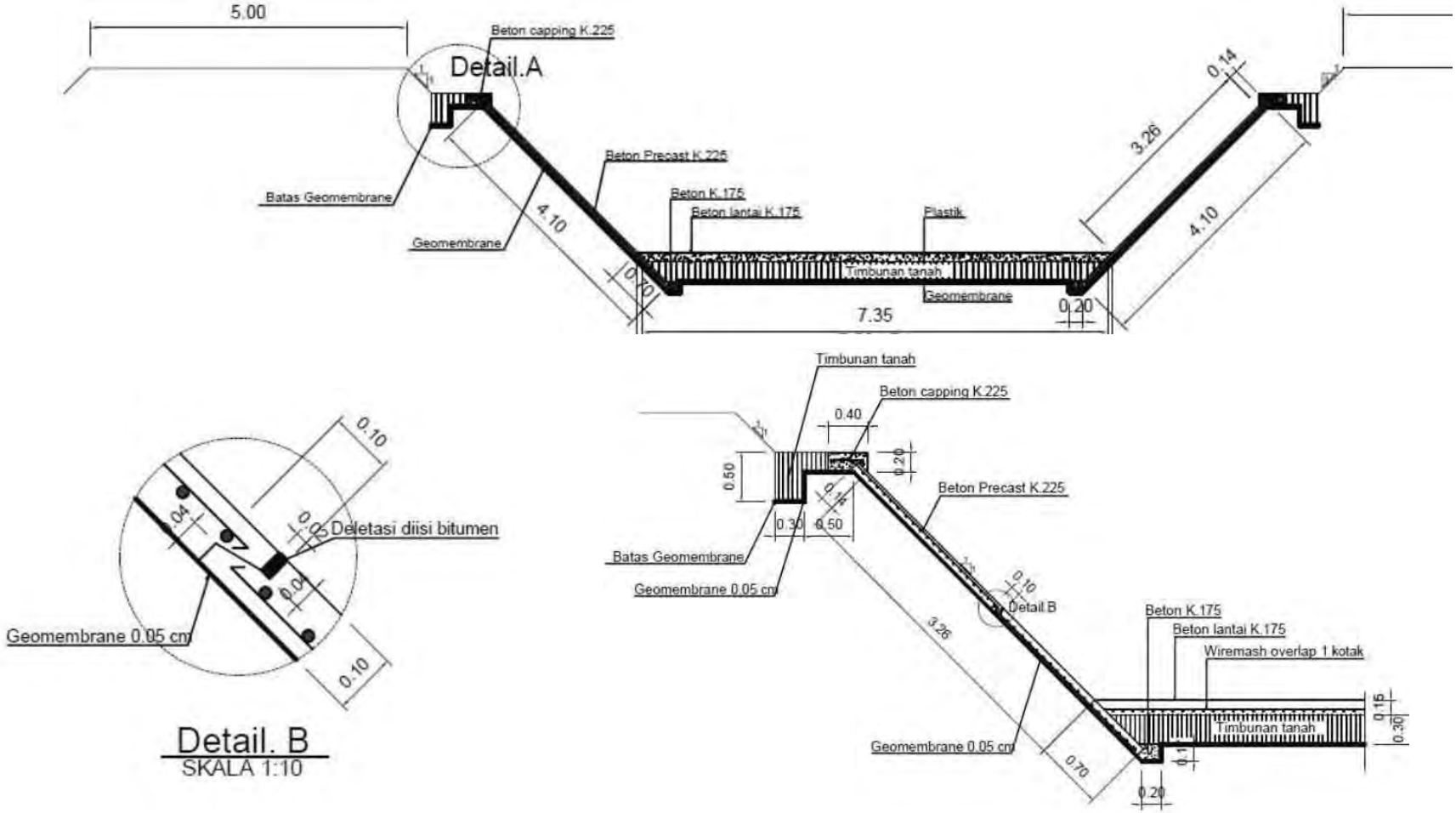
TYPICAL MAIN CANAL

The Typical design of Main Canal



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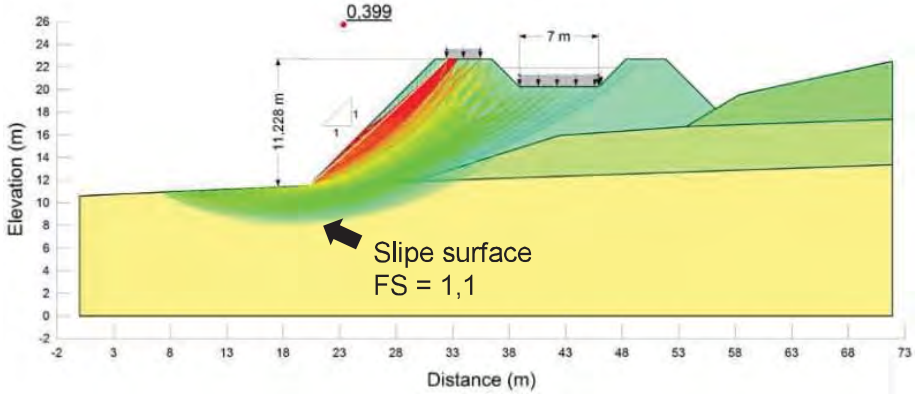
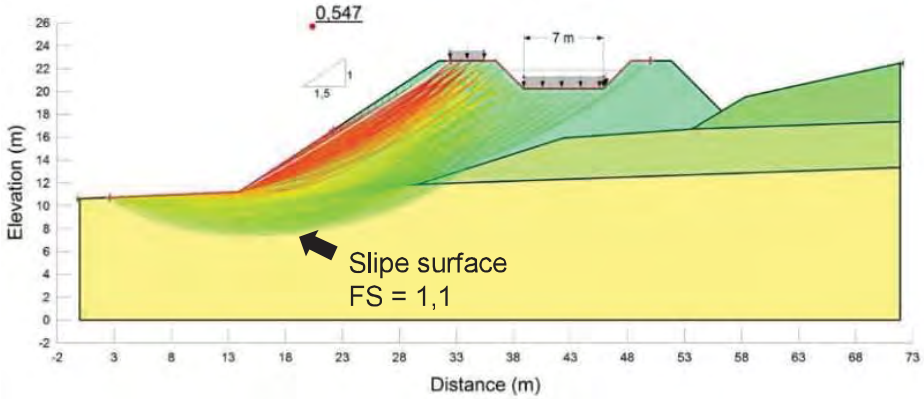
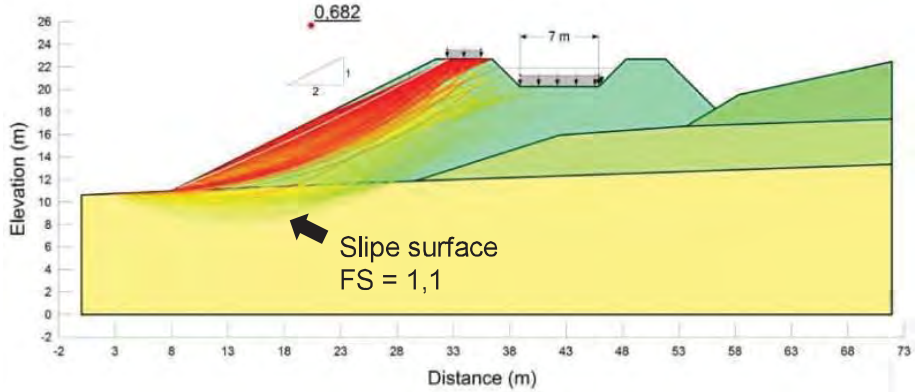
SLOPE STABILITY Sibalaya Site







Factor of Safety ➔

0 0,5 1,1

Noted:

1. Slope stability analized using GEOSTUDIO Morgenstern-Price Analysis Type
2. Pseudostatic condition Kh = 0,3612,
3. Surcharge load = 10 kPa in the top of slope,
4. And canal + water weight = 19,361 kPa

Global Factor of Safety Without Reinforcement

Slope Angle Variation	Global FS	Note
1 : 1	0,399	< 1,1
1 : 1,5	0,547	< 1,1
1 : 2	0,682	< 1,1
FS mininimum for seismic	1,1	

Conclusions:

1. All slope variations does not meet factor of safety requirement
2. Required slope reinforcement
3. Must be notice there is slip surface ± 3 m below ground surface

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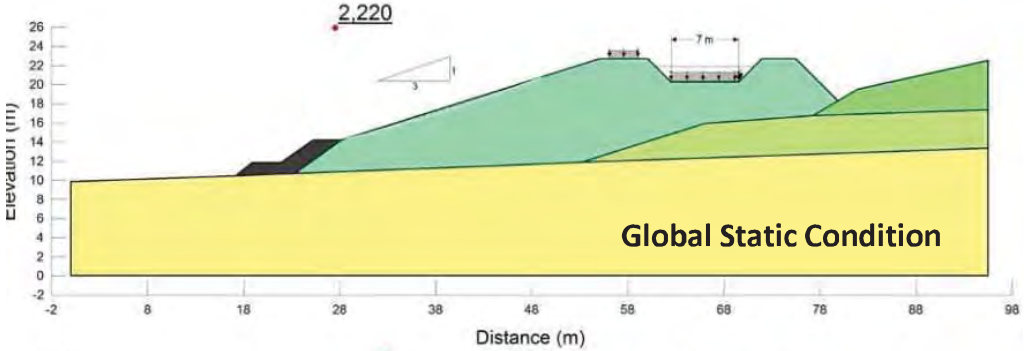
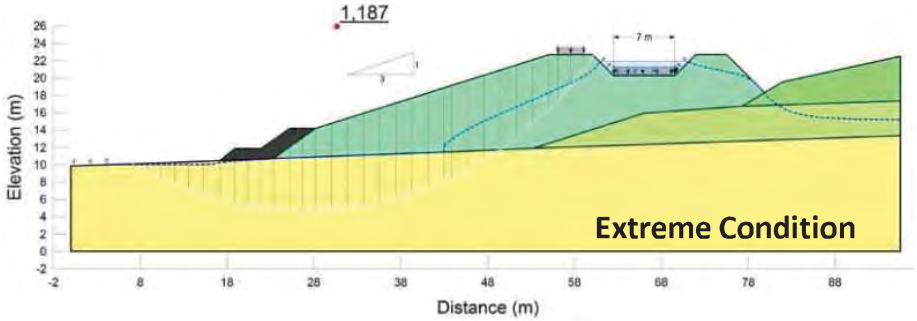
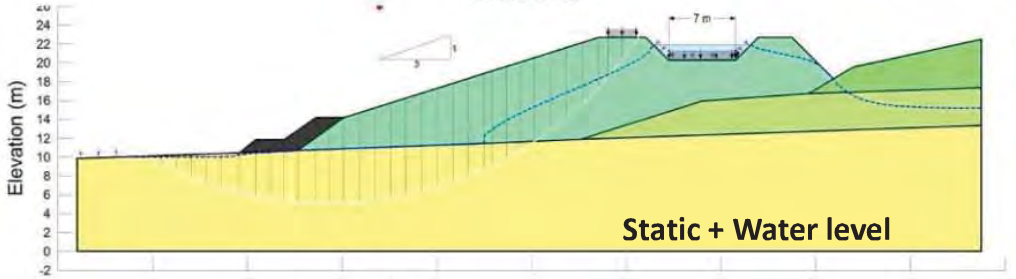
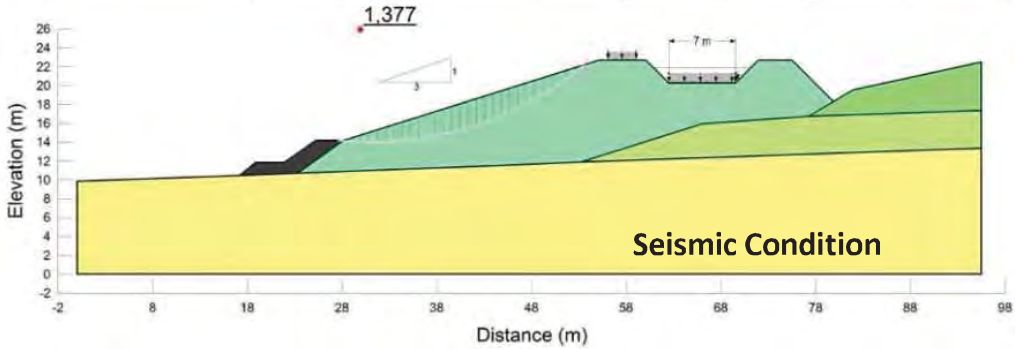
Option One Riprap Reinforced Slope









Factor of Safety Geosynthetic Reinforced Slope

No.	Slope Angle Variation	Global FS	Note
1.	Static condition	**2,220**	**> 1,5**
2.	Static + water level	**2,074**	**> 1,5**
3.	Seismic condition	**1,377**	**> 1,1**
4.	Extreme seismic + water level	**1,187**	**> 1,1**
	FS mininimum for seismic	1,1	

Note:

1. All FS not satisfied

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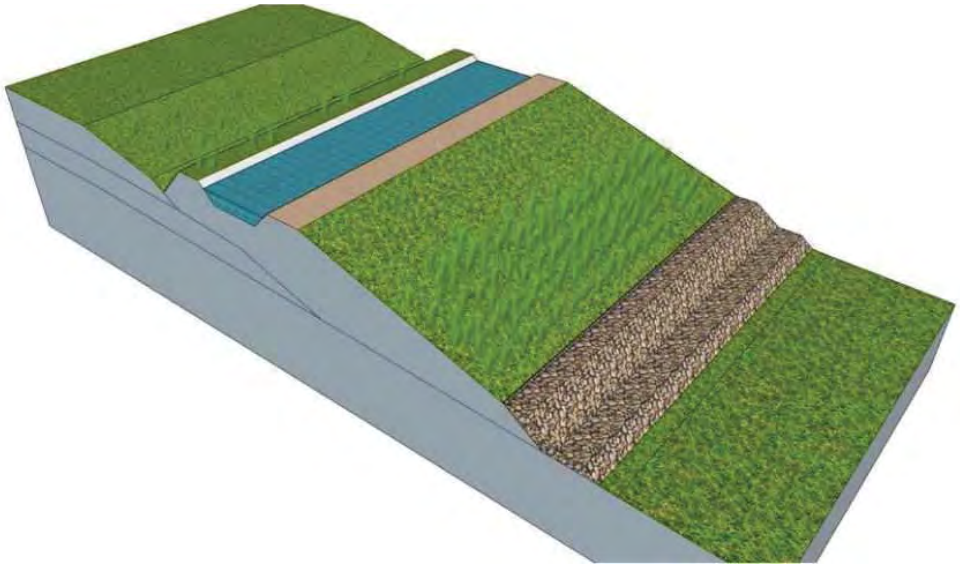
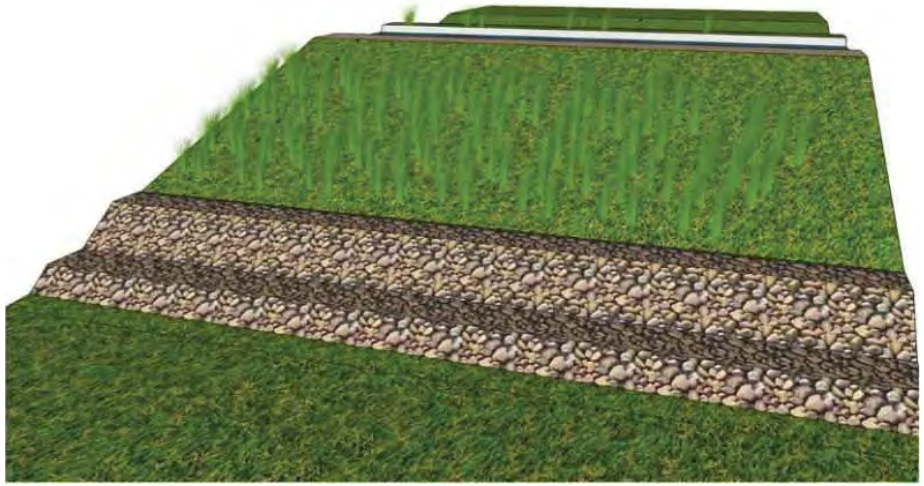
Riprap Reinforced Slope





3D Riprap Reinforced Slope

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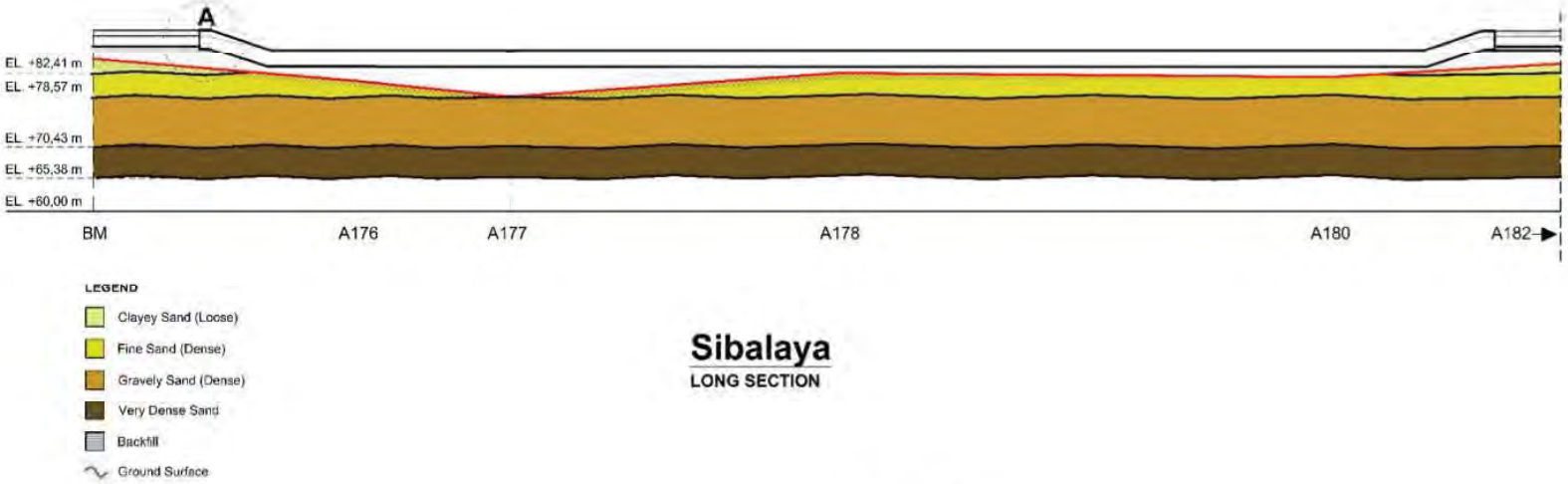
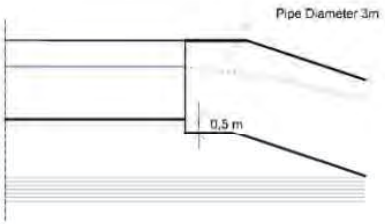
Option Two HDPE PIPE Canal with Stone Column Reinforced



Sibalaya
LONG SECTION



Detail A

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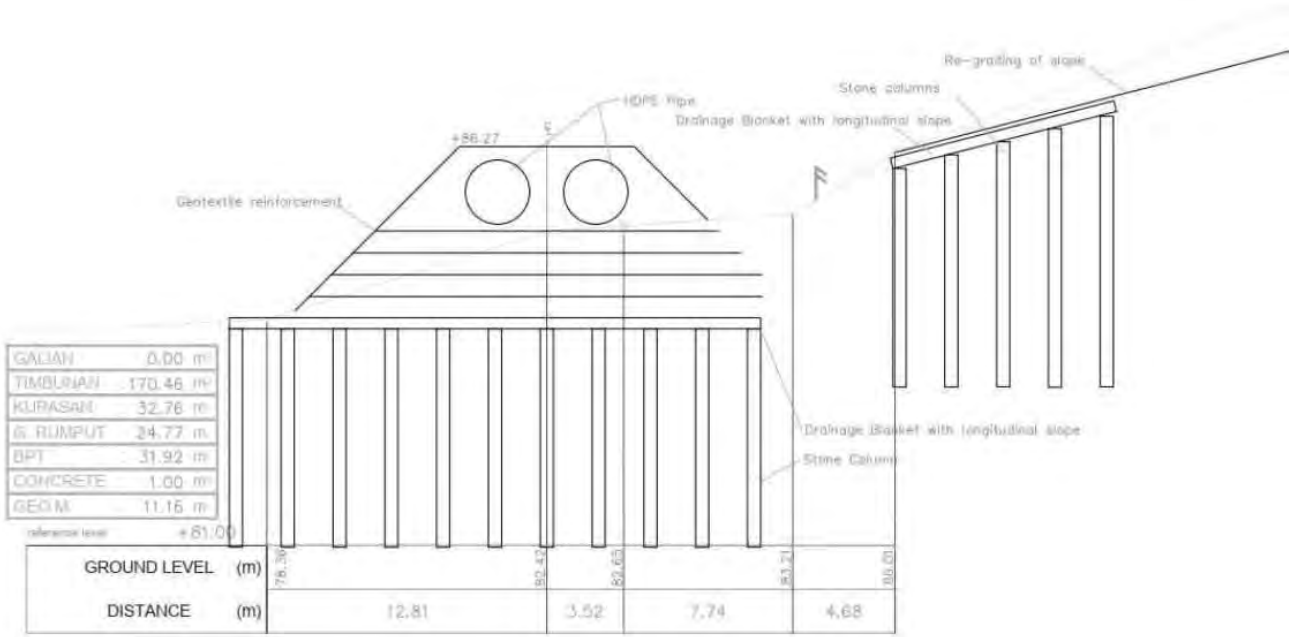
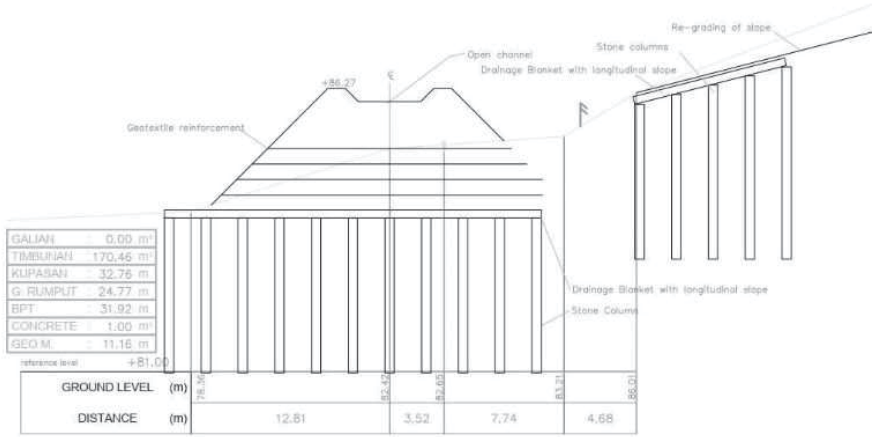
Option Two HDPE PIPE Canal with Stone Column Reinforced



Cross Section HDPE With Stone Column

Alternative Open Channel



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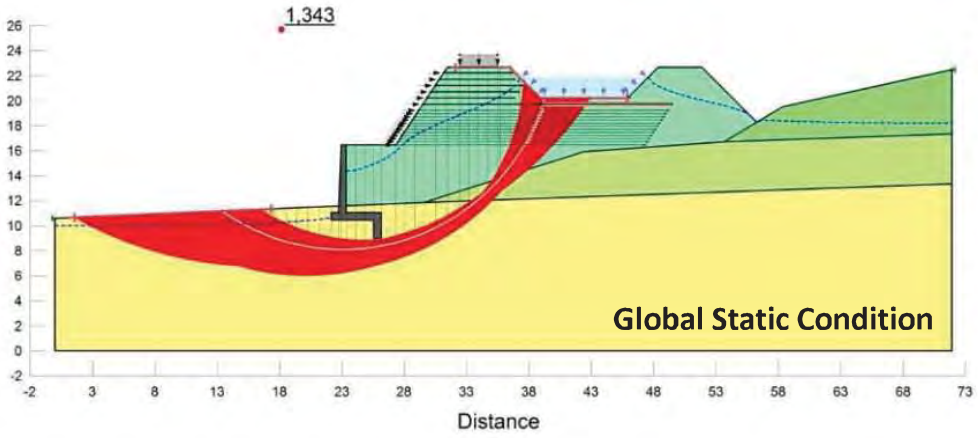
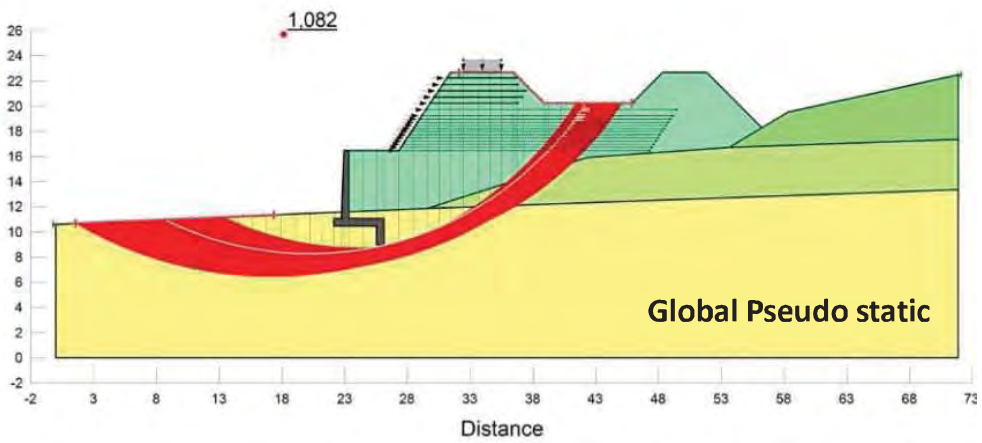
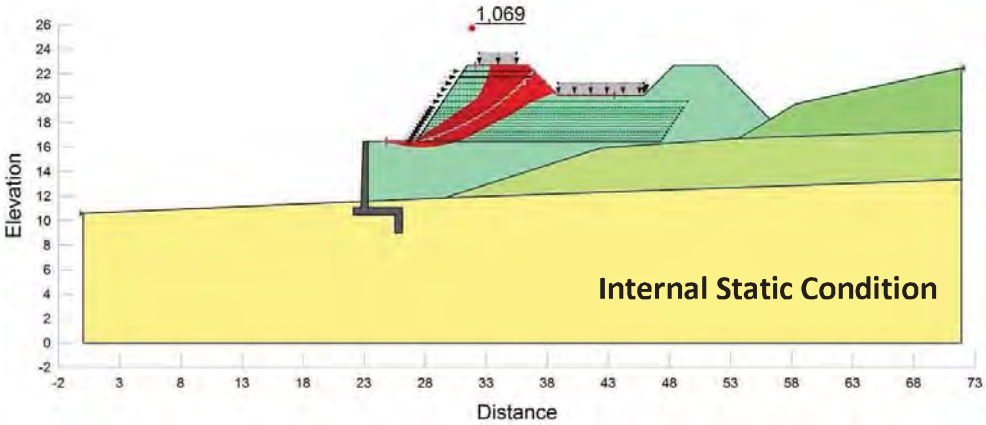
OPTION 3 GEOSYNTHETIC with CANTILEVER Reinforced Slope







Factor of Safety Geosynthetic Reinforced Slope

No.	Slope Angle Variation	Global FS	Note
1.	Static + water level	1,343	< 1,5
2.	Global Seismic condition	1,082	< 1,1
3.	Internal Seismic condition	1,069	< 1,1
	FS mininimum for seismic	1,1	

Note:

1. All FS not satisfied

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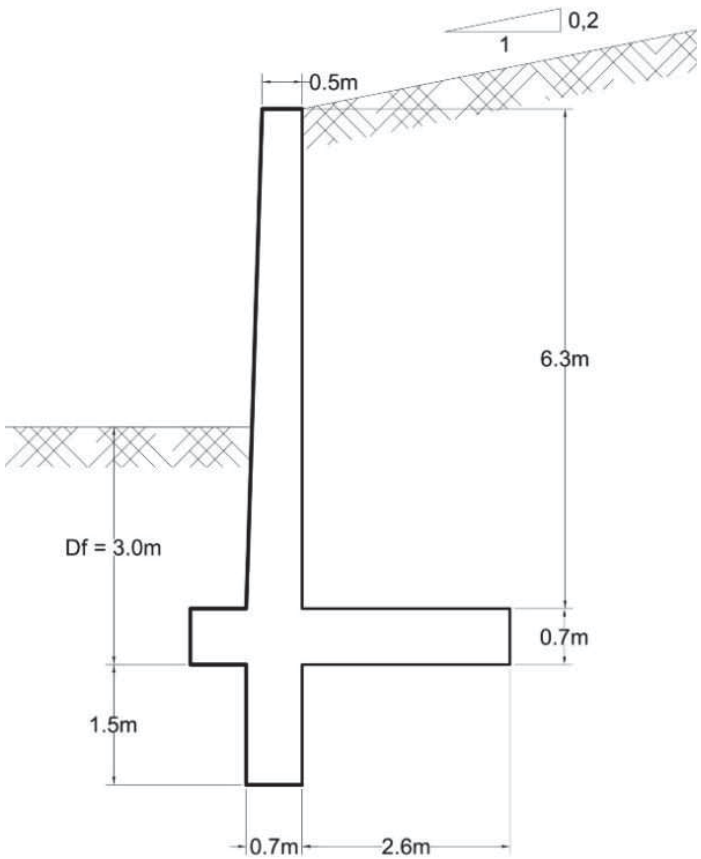
PRELIMINARY DESIGN – CANTILEVER WALL



External Stability of Cantilever Wall (Static Contidition)

Stability Requirement	FS	FS minimum
Overturning	3,994	> 3
Sliding	6,520	> 1,5
Bearing Capacity Failure	11,106	> 3

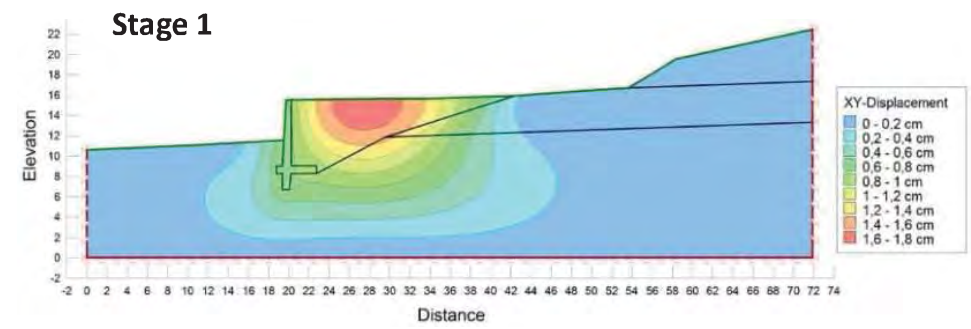
External Stability of Cantilever Wall (Pseudo static Contidition)

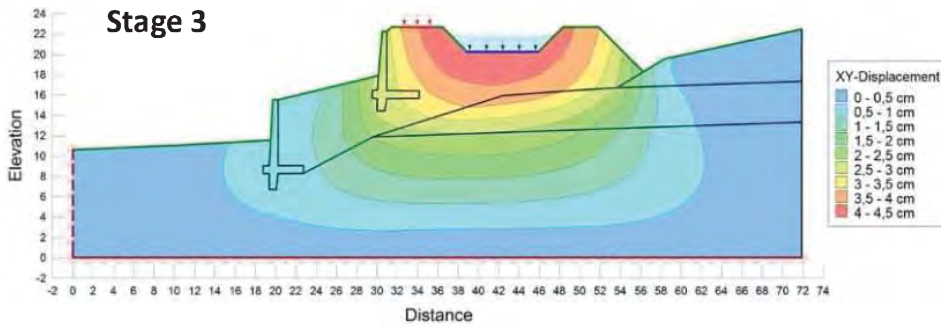
Stability Requirement	FS	FS minimum
Overturning	**1,364**	**> 1,1**
Sliding	1,463	> 1,1
Bearing Capacity Failure	3,390	> 1,1

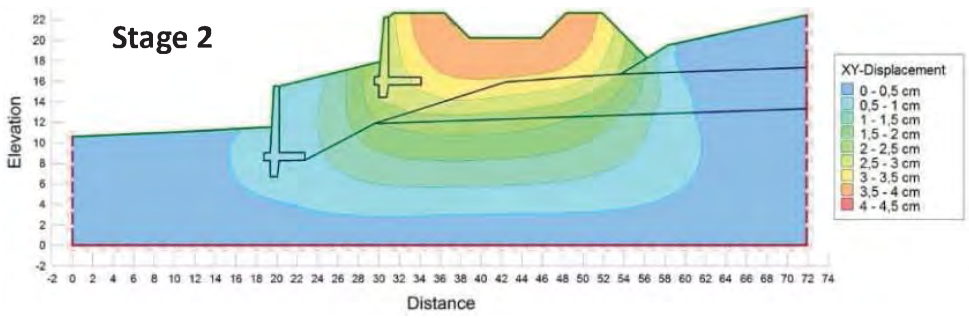
Note:

1. Calculation are done using spreadsheet (Appendix 1. Cantilever Wall)
2. Pseudo static condition govern wall stability.
3. Cause soil material primary sand/gravel, that was assume soil strength in drained conditions.

GLOBAL STABILITY ANALYSIS– CANTILEVER WALL







Note:

1. Deformation maximum ±4,5 cm at stage 3 service condition.

OPTION 4

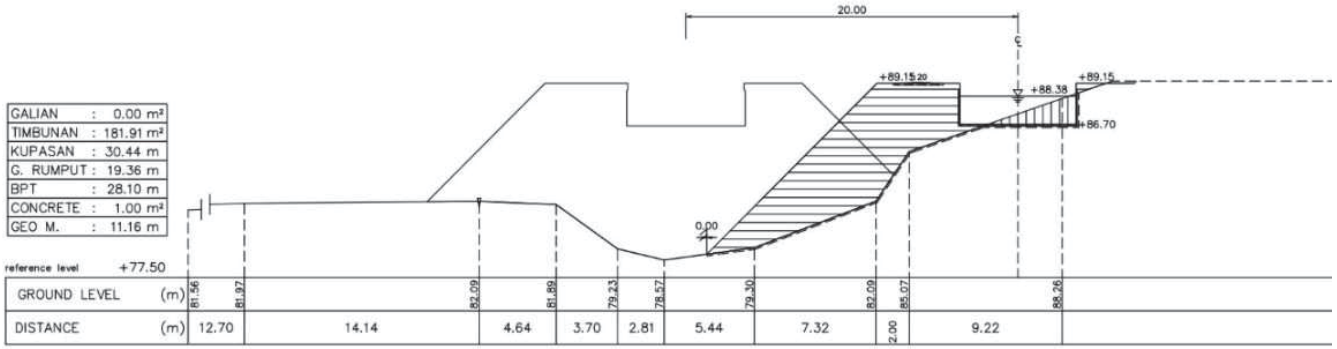
Aligment Revise

New Alignment

Cross Section

Noted:

1. Offset 20m from current position
2. Need to check hydraulic of the canal & other structure



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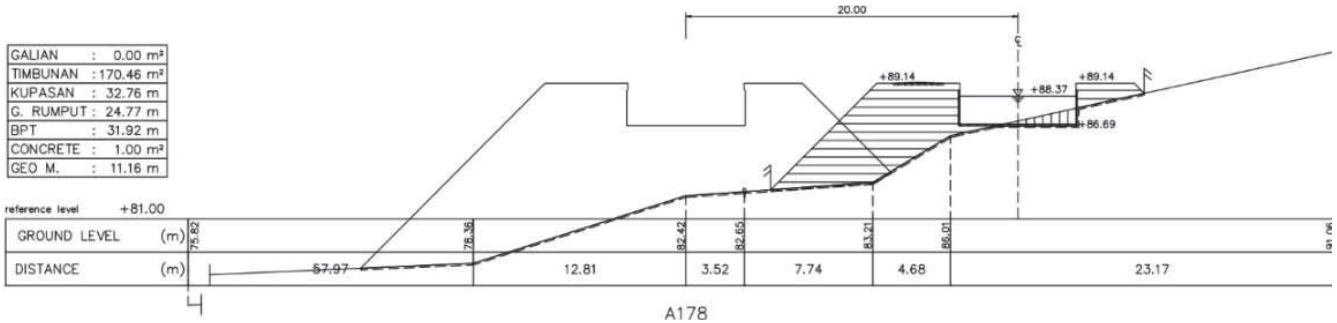

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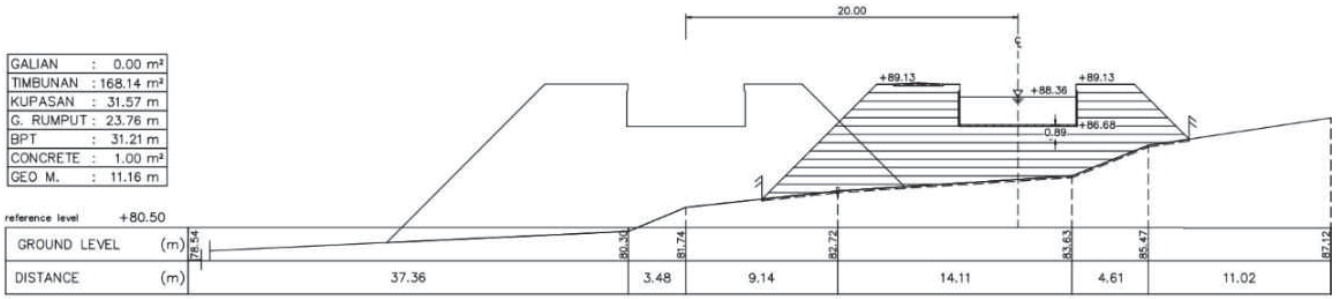
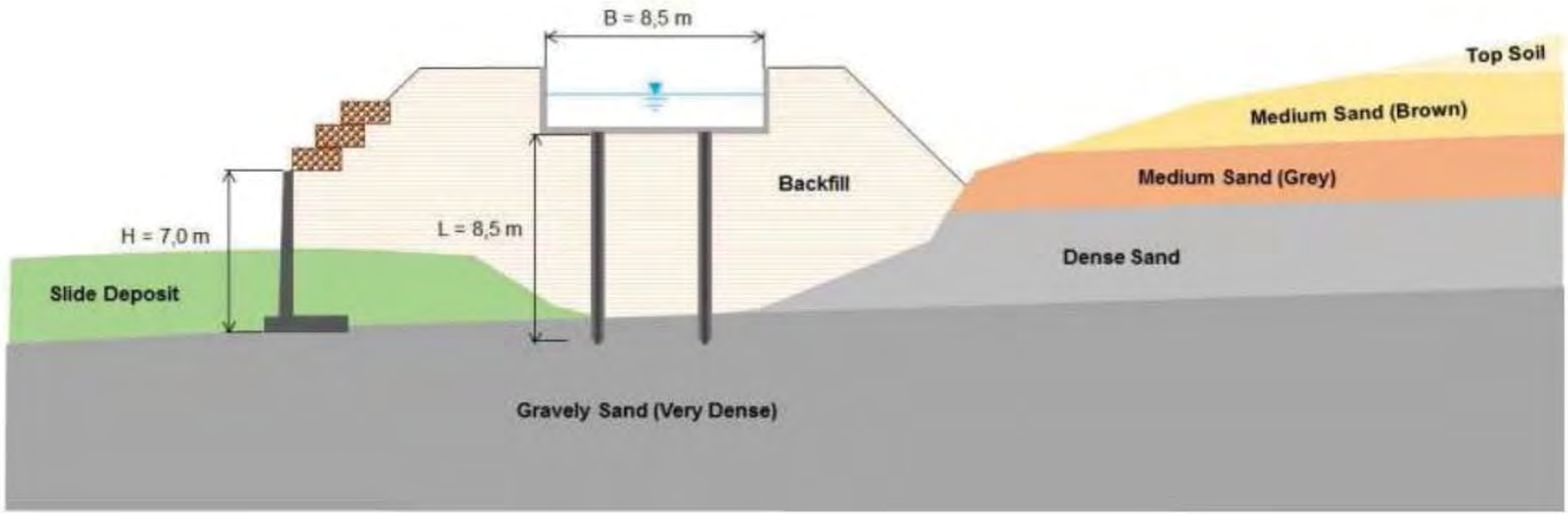


A180

OPTION 5 Micro Pile



Option – Concrete channel with piled foundation / made ground

PILE STABILITY ANALYSIS

Negative skin friction

$H_f = 7{,}5\ \text{m}$ (backfilll height)

$\gamma_f = 18\ \frac{\text{kN}}{\text{m}^3}$ (backfilll unit weight)

$\phi' = 32$ (backfilll internal friction angle)

$p = \pi \cdot D = 1{,}5708\ \text{m}$ (Pile parimeter)

$K' = 1 - \sin(\phi') = 0{,}4486$

$\delta' = 0{,}6 \cdot \phi' = 19{,}2$

$Q_n = \frac{p \cdot K' \cdot \gamma_f \cdot H_f^2 \cdot \tan(\delta')}{2} = 130{,}39\ \text{kN}$ (Negative skin friction)

Ultimit point load at the top pile

$Q_u = \frac{\left((q_s \cdot b_s) + (q_w \cdot b) + (2 \cdot Q_{wall})\right)}{2} + Q_n = 1059{,}469\ \text{kN} < Q_{all} = 1086{,}2057\ \text{kN}$

Check:

if $Q_u < Q_{all}$ = "OK"
("OK")
else
("Not OK")

Elastic Settlement

$f_c = 25\ \text{MPa}$ (Concrete grade)

$E_p = 4700\ \text{MPa} \cdot \sqrt{f_c \cdot \frac{1}{\text{MPa}}} = 2{,}35 \cdot 10^7\ \text{kPa}$ (Concrete elastic modulus)

$D = 0{,}5\ \text{m}$ (Pile diameter)

$A_p = 0{,}1963\ \text{m}^2$ (Cross sectional pile area)

$L = 8{,}5\ \text{m}$ (Pile length)

$H = \infty$

$\nu = 0{,}3$ (Poisson's ratio)

Elastic settlement Poulos and Davis Method:

$\frac{L}{D} = 17$

$\frac{L}{H} = 0$

from figure 1,

$I_p = 1{,}5$

$Q = Q_u - Q_n = 929{,}079\ \text{kN}$ (load applied on the pile head)

$Q_{wp} = Q_u = 1059{,}4688\ \text{kN}$ (working load at the pile point)

$Q_{avg} = \frac{Q + Q_{wp}}{2} = 994{,}2739\ \text{kN}$

$E_s = 19500\ \text{kPa}$ (Elastic modulus of soil beneath p

$s_t = \frac{Q}{L \cdot E_s} \cdot I_p + \frac{Q_{avg} \cdot L}{A_p \cdot E_p} = 10{,}2395\ \text{mm}$ **(Elastic settlement)**

Note : elastic settlement < 25,4 mm (OK)

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PILE STABILITY ANALYSIS

Geometry

$L = 8{,}5\ \text{m}$ (Pile foundation depth)

$D = 0{,}5\ \text{m}$ (Pile diameter)

$A_p = \frac{1}{4} \cdot \pi \cdot D^2 = 0{,}1963\ \text{m}^2$ (Cross section area of pile)

$p_a = 100\ \text{kPa}$ (atmospheric pressure)

$N_{60} = 42$ (The average value of the standard penetration number near the pile point (about 10D above to 4D below the pile point)

$w_c = 24\ \frac{\text{kN}}{\text{m}^3}$

Bearing capacity single pile

Using formula suggested by Meyerhof (1976)

$qp = 0{,}4 \cdot p_a \cdot N_{60} \cdot \left(\frac{L}{D}\right) \leq 4 \cdot p_a \cdot N_{60}$ (Ultimate point resistance)

$qp_1 = 0{,}4 \cdot p_a \cdot N_{60} \cdot \left(\frac{L}{D}\right) = 28560\ \text{kPa}$

$qp_2 = 4 \cdot p_a \cdot N_{60} = 16800\ \text{kPa}$

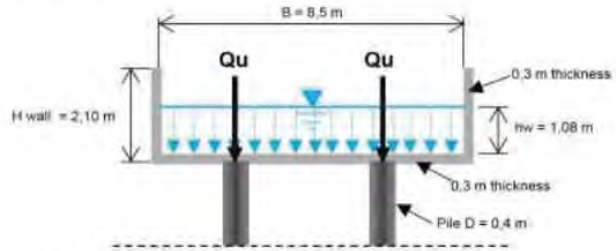
$q_p = \min\left(\begin{bmatrix} qp_1 \\ qp_2 \end{bmatrix}\right) = 16800\ \text{kPa}$

$Q_p = A_p \cdot q_p = 3298{,}6723\ \text{kN}$ (Point bearing capacity)

$FS = 3$ (Factor of Safety)

$Q_{all} = \frac{Q_p - (w_c \cdot A_p \cdot L)}{FS} = 1086{,}2057\ \text{kN}$ **(Allowable bearing capacity)**

Point load acting on the top pile (Qu)



$t_s = 0{,}3\ \text{m}$ (slab thickness)

$t_{wall} = 0{,}3\ \text{m}$ (wall thickness)

$b = 8{,}5\ \text{m}$ (channel width)

$b_s = b + (2 \cdot t_{wall}) = 9{,}1\ \text{m}$ (slab width)

$h_{wall} = 2{,}1\ \text{m}$ (wall height)

$h_w = 1{,}08\ \text{m}$ (water height on in the channel)

$\gamma_w = 9{,}81\ \frac{\text{kN}}{\text{m}^3}$ (unit weight of water)

$w_c = 24\ \frac{\text{kN}}{\text{m}^3}$ (unit weight of concete)

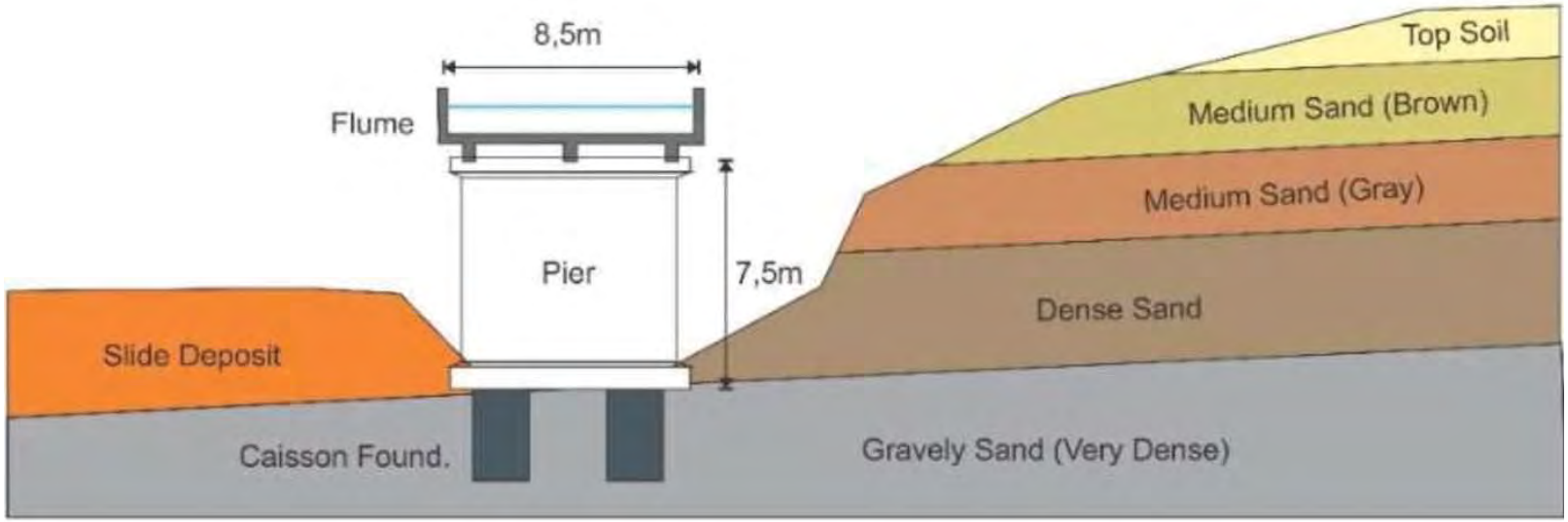
$s = 10\ \text{m}$ (Pile interval)

$Q_{wall} = t_{wall} \cdot h_{wall} \cdot s \cdot w_c = 151{,}2\ \text{kN}$

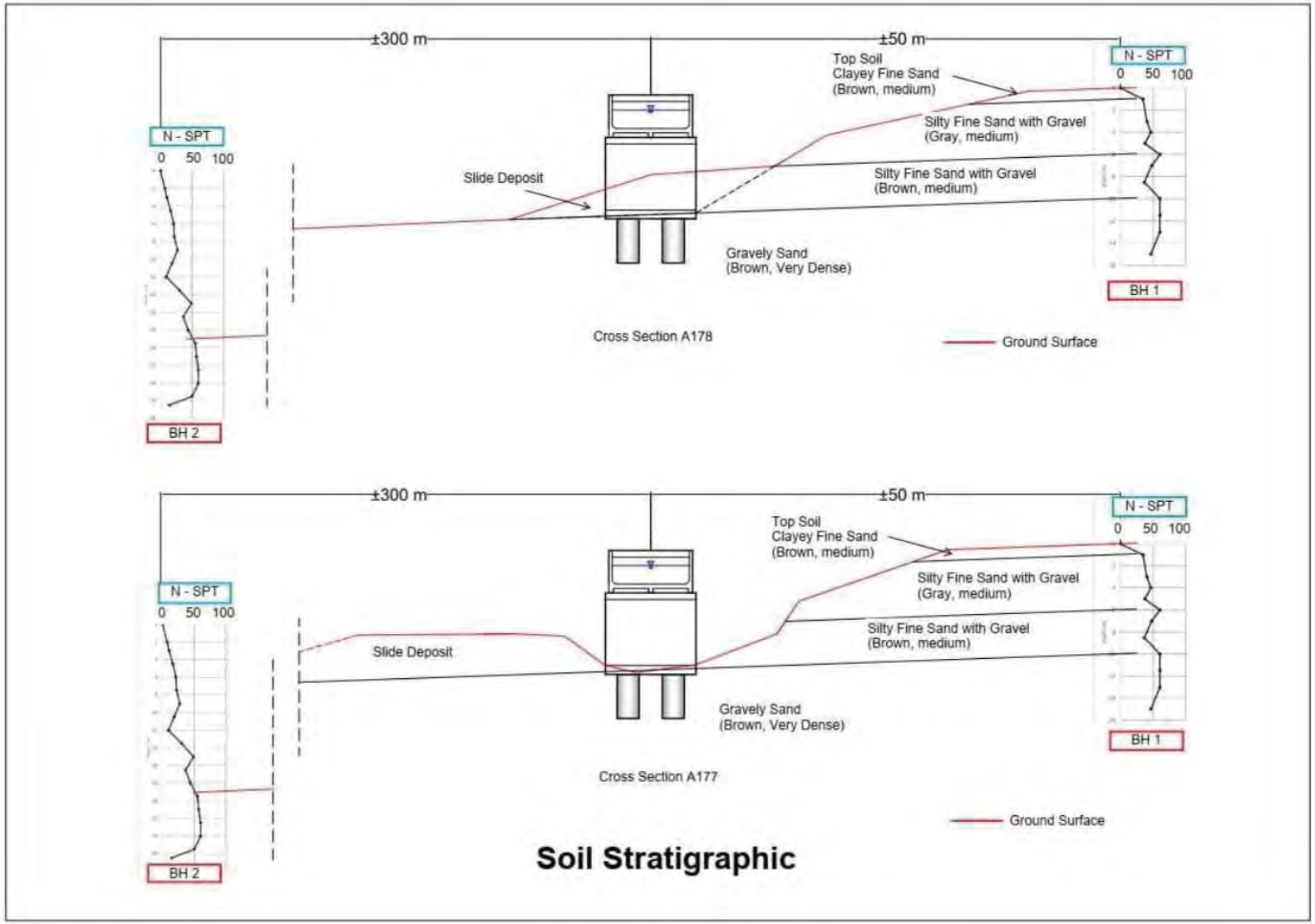
$q_s = t_s \cdot w_c \cdot s = 72\ \frac{\text{kN}}{\text{m}}$

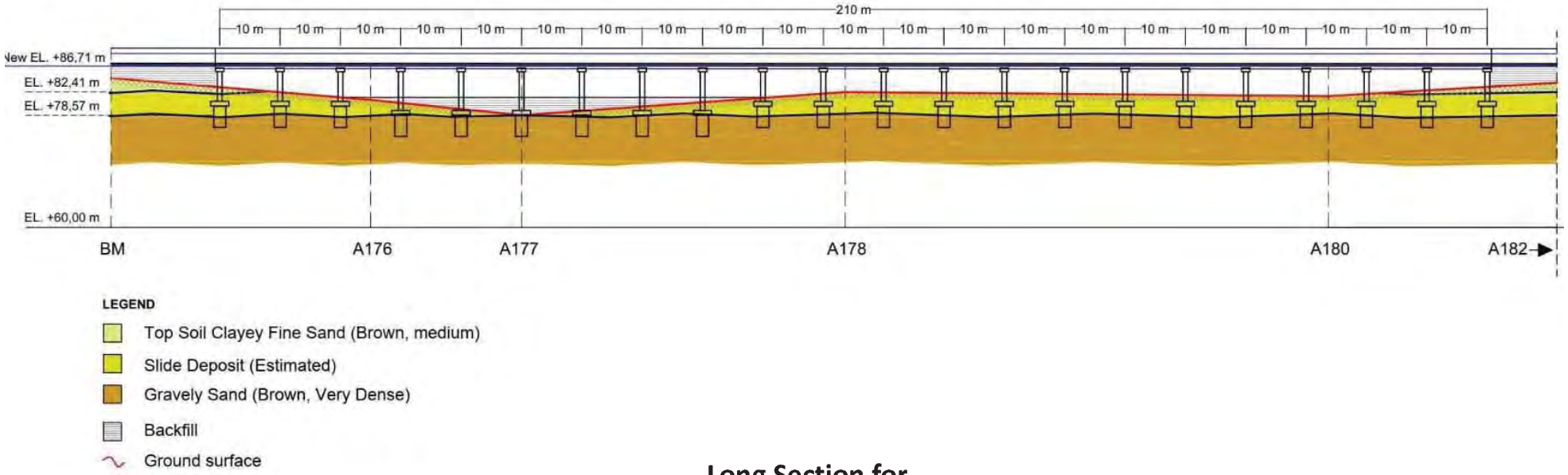
$q_w = h_w \cdot \gamma_w \cdot s = 105{,}948\ \frac{\text{kN}}{\text{m}}$

OPTION 6 Pier and Caisson



Option 2 – Concrete aqueduct with caisson foundation


±300 m
±50 m
N - SPT
0 50 100
Top Soil
Clayey Fine Sand
(Brown, medium)
Silty Fine Sand with Gravel
(Gray, medium)
Silty Fine Sand with Gravel
(Brown, medium)
Slide Deposit
Gravely Sand
(Brown, Very Dense)
BH 1
BH 2
Cross Section A178
Ground Surface
±300 m
±50 m
N - SPT
0 50 100
Top Soil
Clayey Fine Sand
(Brown, medium)
Silty Fine Sand with Gravel
(Gray, medium)
Silty Fine Sand with Gravel
(Brown, medium)
Slide Deposit
Gravely Sand
(Brown, Very Dense)
BH 1
BH 2
Cross Section A177
Ground Surface
Soil Stratigraphic



Long Section for Sibalaya Aqueduct

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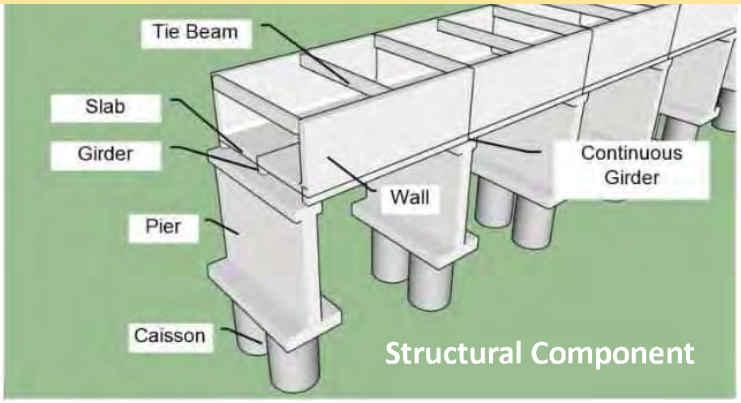
VERTICAL LOAD



Super structure Dead Load (ΣWs)

	B	H	L	n	Vol	W
	m	m	m		m^3	kN
Water	7.00	1.68	10.00	1.00	117.60	1153.66
Tie Beam	0.30	0.60	7.00	5.00	6.30	151.20
Wall	0.30	2.75	10.00	2.00	16.50	396.00
Slab	7.00	0.30	10.00	1.00	21.00	504.00
Girder	0.80	0.40	10.00	3.00	9.60	230.40
	0.00	0.00	0.00	0.00	0.00	0.00
					ΣWs	2435.256

Pier Dead Load (ΣWpier)

	B	H	L	n	Vol	W
	m	m	m		m^3	kN
1	3.00	0.80	8.20	1.00	19.68	472.32
2	0.80	6.00	8.20	1.00	39.36	944.64
3	1.40	0.60	8.20	1.00	6.89	165.31
4	1.10	2.20	8.20	1.00	19.84	357.19
5	1.10	2.20	8.20	1.00	19.84	357.19
	0.00	0.00	0.00	0.00	0.00	0.00
					ΣW	2296.656

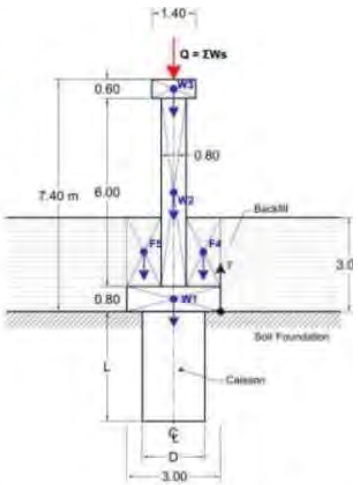


Figure 2. Vertical Load

LATERAL FORCES

Spectral Design

Level Hazard probability exceeded 7% in 75 years (SNI 2833-2016)

Site class = SD (Medium Soil) for NSPT 15 - 50

$PGA = 1{,}4\ g_e$ (1,2 - 1,5g)

$S_s = 3\ g_e$ (>3g)

$S_1 = 1{,}7\ g_e$ (1,5 - 2,0g)

$F_a = 1$ for PGA> 0,5g or Ss≥ 1,25g

$F_v = 1{,}5$ for S1≥ 0,5g

$S_{DS} = F_a \cdot S_s = 3\ g_e$

$S_{D1} = F_v \cdot S_1 = 2{,}55\ g_e$

$T_s = \frac{S_{D1}}{S_{DS}}\ \text{sec} = 0{,}85\ \text{s}$

$T_0 = 0{,}2 \cdot T_s = 0{,}17\ \text{s}$

$F_{PGA} = 1$

$A_s = F_{PGA} \cdot PGA = 1{,}4\ g_e$ Spectral Acc. in gravity

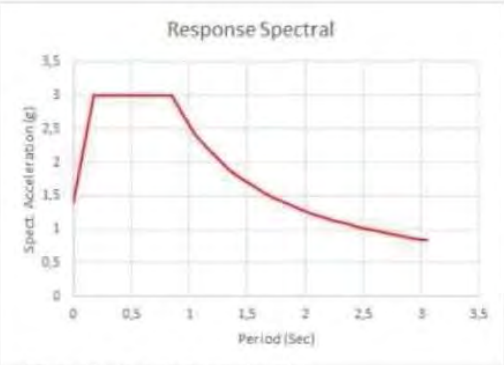


Figure 3. Spectral Acceleration

Inertia of pier

$h = 0{,}8\ \text{m}$

$b = 8{,}2\ \text{m}$

$I = \frac{1}{12} \cdot b \cdot h^3 = 0{,}3499\ \text{m}^4$

Seismic coefficient

$f_c = 30$ Concrete grade

$E_c = 4700 \cdot \sqrt{f_c} \cdot 10^3\ \text{kPa} = 2{,}5743 \cdot 10^7\ \text{kPa}$ Concrete elastic modulus

$K = \frac{3 \cdot E_c \cdot I}{h^3} = 5{,}2773 \cdot 10^7\ \frac{\text{kN}}{\text{m}}$ Pier Stiffness

$W_t = \left(\Sigma W_s + \Sigma W_{pier}\right)\ \text{kN} = 4731{,}912\ \text{kN}$ Total dead load

$T = 2 \cdot \pi \cdot \sqrt{\frac{W_t}{g_e \cdot K}} = 0{,}019\ \text{s}$ Structure period

$C_{sm} = \left(S_{DS} - A_s\right) \cdot \frac{T}{T_0} + A_s = 1{,}5788\ g_e$ Seismic elastic coeff.

$C_{sm\_d} = \frac{C_{sm}}{9{,}81} \cdot \frac{1}{g_e} = 0{,}1609$ Seismic elastic coeff./grav.

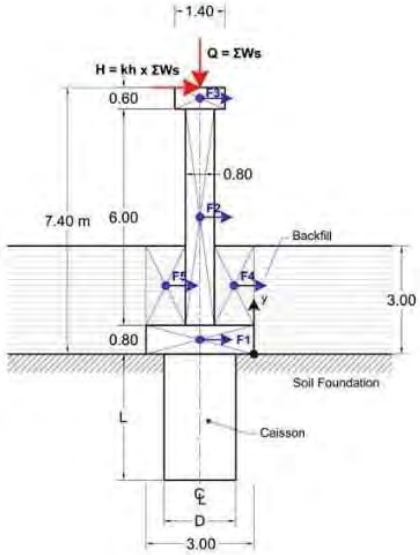
$R = 1{,}5$ Modification response For wall pier (Table 6, SNI 2833-2016)

$EQ = \frac{C_{sm}}{R} \cdot Wt$ Seismic load for bridge used formula (SNI 2833-2016 form. 4)

$k_h = \frac{C_{sm\_d}}{R} = 0{,}1073$ Seismic Coeff.

Inertial Forces

	W	F: W x kh	y	Mo
	kN	kN	m	kN.m
1	472.32	50.68	0.4	20.27
2	944.64	101.35	3.26	329.9
3	165.31	17.74	6.01	106.6
4	357.19	38.32	1.8	68.98
5	357.19	38.32	1.8	68.98
ΣWs	2435.26	261.29	6.31	1648.71
	ΣF	507.7	ΣM	2243.45



Borehole 1

Depth (m)	SPT N
0	0
1	34
3	40
4	46
5	37
6	60
7	47
8,5	36
10	60
11,5	60
13	60
15	46

Factor of Safety Bearing Capacity

$$N_{60} = \frac{37+60+47+36+60}{5} = 48$$

$$qp = 0{,}4 \cdot p_a \cdot N_{60} \cdot \left[\frac{L}{D}\right] \leq 4 \cdot p_a \cdot N_{60}$$

$$Q_p = A_p \cdot q_p = 12063{,}7158 \text{ kN}$$

$$Q_u = \frac{\left(\Sigma W_s + \Sigma W_{pier}\right) \text{ kN}}{2} = 2365{,}956 \text{ kN}$$

$$FS = \frac{Q_p - \left(w_c \cdot A_p \cdot L\right)}{Q_u} = 4{,}97 \qquad \text{FS > 3}$$

Lateral Loaded Pile

Factor of Safety Lateral Load

Brom's method

The failure occurs because the ultimate resistance of the soil is excedeed

a. At ultimate loads the foundation does not fail.

b. Failure takes place when the pile rotates as a unit around a point located below the ground surface.

Figure 5. Lateral Deformation Broms Method

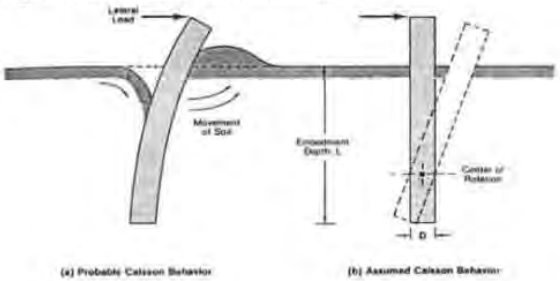
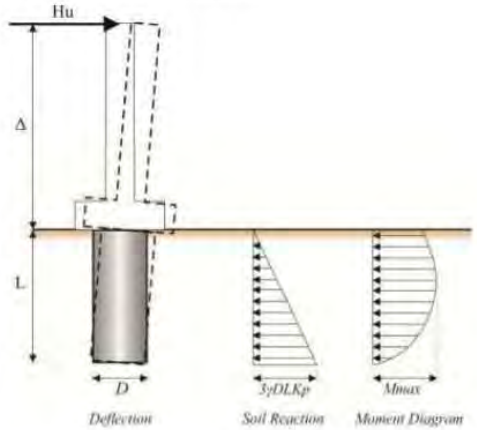


Fig. 1 Caisson Behavior in Granular Soil
(After Broms, Ref. No. 5)

Figure 6. Failure Mechanism



$$d = D = 2 \text{ m}$$

$$L = 4 \text{ m}$$

$$\gamma = 17 \frac{\text{kN}}{\text{m}^3}$$

$$\varphi = 42 \text{ deg}$$

$$K_p = \tan\left(45 \text{ deg} + \frac{\varphi}{2}\right)^2 = 5{,}0447$$

$$\Delta = \frac{\Sigma M}{\Sigma F} \text{ m} = 4{,}4189 \text{ m}$$

$$H_u = \frac{0{,}5 \cdot \gamma \cdot d \cdot L^3 \cdot K_p}{\Delta + L} = 651{,}9433 \text{ kN}$$

$$f = 0{,}82 \cdot \sqrt{\frac{H_u}{d \cdot K_p \cdot \gamma}} = 1{,}5987 \text{ m}$$

$$M_{max} = H_u \cdot \left(\Delta + \frac{2}{3} \cdot f\right) = 3575{,}6739 \text{ kN m}$$

$$H = \frac{\Sigma F \text{ kN}}{2} = 253{,}8502 \text{ kN}$$

Horizontal load assume equal for all caisson

$$FS_h = \frac{H_u}{H} = 2{,}5682 \qquad \text{FS >2,5}$$

Factor of Safety against lateral load

Elastic Settlement

$f_c = 30\ \text{MPa}$ (Concrete grade)

$E_p = 4700\ \text{MPa} \cdot \sqrt{f_c \cdot \frac{1}{\text{MPa}}} = 2{,}5743 \cdot 10^{7}\ \text{kPa}$ (Concrete elastic modulus)

$D = 2\ \text{m}$ (Pile diameter)

$A_p = 3{,}1416\ \text{m}^2$ (Cross sectional pile area)

$L = 4\ \text{m}$ (Pile length)

$H = \infty$

$\nu = 0{,}3$ (Poisson's ratio)

Elastic settlement Poulos and Davis Method:

$\frac{L}{D} = 2$

$\frac{L}{H} = 0$

$I_p = 0{,}6$ from figure below

$Q = Q_u = 2365{,}956\ \text{kN}$ (load applied on the pile head)

$Q_{wp} = Q_u + (w_c \cdot A_p \cdot L) = 2667{,}5489\ \text{kN}$ (working load at the pile point)

$Q_{avg} = \frac{Q + Q_{wp}}{2} = 2516{,}7524\ \text{kN}$

$E_s = 19500\ \text{kPa}$ (Elastic modulus of soil beneath foundation')

$s_t = \frac{Q}{L \cdot E_s} \cdot I_p + \frac{Q_{avg} \cdot L}{A_p \cdot E_p} = 18{,}32\ \text{mm}$ **(Elastic settlement)**

Note : elastic settlement < 25,4 mm (OK)

Factor of Safety Eccentric Load

$s = 5\ \text{m}$

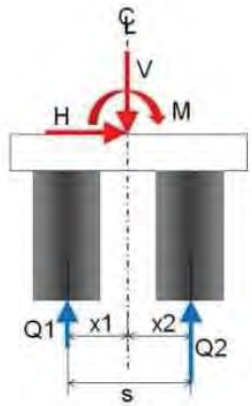
$x_1 = \frac{s}{2} = 2{,}5\ \text{m}$

$x_2 = -\frac{s}{2} = -2{,}5\ \text{m}$

$\Sigma x = x_1^{\ 2} + x_2^{\ 2} = 12{,}5\ \text{m}^2$

$V = (\Sigma W_s + \Sigma W_{pier})\ \text{kN} = 4731{,}912\ \text{kN}$

$n = 2$ Number of caisson foundation



$\Sigma M\ \text{kN m} = 2243{,}4523\ \text{kN m}$

$\Sigma F\ \text{kN} = 507{,}7004\ \text{kN}$

$Q_1 = \frac{V}{n} + \frac{\Sigma M\ \text{kN m} \cdot x_2}{\Sigma x} = 1917{,}2655\ \text{kN}$

$Q_2 = \frac{V}{n} + \frac{\Sigma M\ \text{kN m} \cdot x_1}{\Sigma x} = 2814{,}6465\ \text{kN}$

$Q_{max} = \max\left(\begin{bmatrix} Q_1 \\ Q_2 \end{bmatrix}\right) = 2814{,}6465\ \text{kN}$

$FS_{bearing\_cap} = \frac{Q_p - (w_c \cdot A_p \cdot L)}{Q_{max}} = 4{,}18$ FS > 3 .. OK

POTENTIAL OPTIONS FOR SIBALAYA LIQUEFACTION ZONE

Potential Option	Advantages	Disadvantages	Resilience
Option 1 – Riprap reinforced slope	• Cheap Geotechnical solution • easily repairable	• Performance in seismic conditions is not guaranteed • Does not satisfy all the factor of safety requirements.	• Good resilience but does not satisfy performance requirement
Option 2 -Two HDPE PIPE Canal with Stone Column Reinforced or straight through open channel with stone column	• Stone columns, acting to reinforce shear zone and allow dissipation of temporary excess pore water pressures generated by and manifesting just after earthquake • Simple earthworks bund with flexible HDPE or earthquake resistant ductile iron pipes (ERDIP) buried in the upper part • easy to repair if damaged in future event reaching ULS condition. • Speed of construction – good • Impact on local environment – minimal	• Design would need further studies to optimise size, length, spacing and extent of improvement • Maybe relatively more expensive than the other solutions	• combined resistance and resilience solution with likely good performance characteristics and good protection relative to safeguarding life • This solution can also be replicated at other locations • Easily repairable

POTENTIAL OPTIONS FOR SIBALAYA LIQUEFACTION ZONE

Potential Option	Advantages	Disadvantages	Resilience
Option 3– GEOSYNTHETIC with CANTILEVER Reinforced Slope	• Structural solution using both geotechnical and structural interventions • Easy to construct	• Potential for poor compaction of backfill material, may result in stability issues • It is better to avoid cantilever retaining wall in the Sibalaya reach where the ground movements is happening continuously • FOS not satisfied	• Cantilever wall maybe difficult to repair if damaged in future by EQ • Structural performance of these walls in large magnitude earthquake is not good.
Option 4– Concrete aqueduct with caisson foundation	• Does not rely on backfill (see option 1) • Able to inspect and maintain structure • Simple in the construction	• Adequate dewatering regime require to ensure design base resistance • Structural option will probably be very expensive to provide and difficult to recover if damaged in future by EQ	• Difficult to repair thus not very resilient
Option 3 – Realignment of the canal	• Easiest to construct – consistent design/materials with the remainder of the canal • Relatively fast to construct (depending on length of route) • Relatively cheap (depending on length of route) • Accommodate the earthquake loads (earthquake resistance)	• Challenging to analyse if the area along the selected route will be resistant to liquefaction • May require significant land acquisition – adverse environmental & social impact and high cost	• Maybe resilient

POTENTIAL OPTIONS FOR SIBALAYA LIQUEFACTION ZONE

Potential Option	Advantages	Disadvantages	Resilience
Option 5–Micro Pile	• General stability and performance requirement satisfied • Locally available granular material can be used as a fill material	• Potential for poor compaction of backfill material, may result in stability issues • May be issues driving piles • Consume more time in construction	• Piles damaged during earthquake maybe difficult to repair and reuse • Not highly resilient
Option 6 – Pier & Caisson	• Does not rely on backfill • Able to inspect and maintain structure • Simple in the construction	• Adequate dewatering regime require to ensure design base resistance • Structural option will probably be very expensive to provide and difficult to recover if damaged in future by EQ	• Not easily repairable

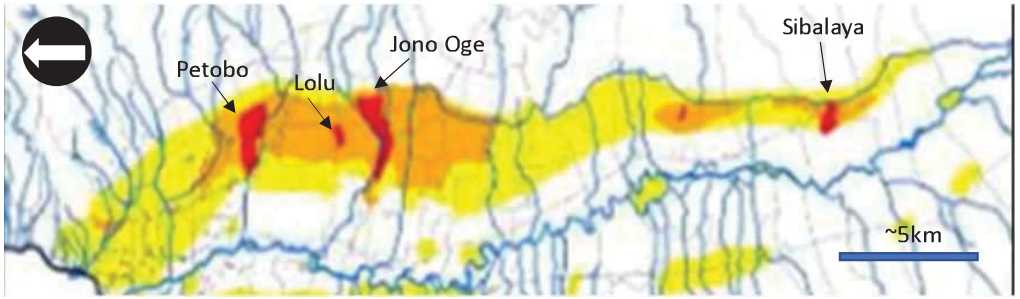


Figure 1: Nalodo Hazard Map (JICA, 2019) [a] which shows the risk of future flow

Legend:

Hazard Rank

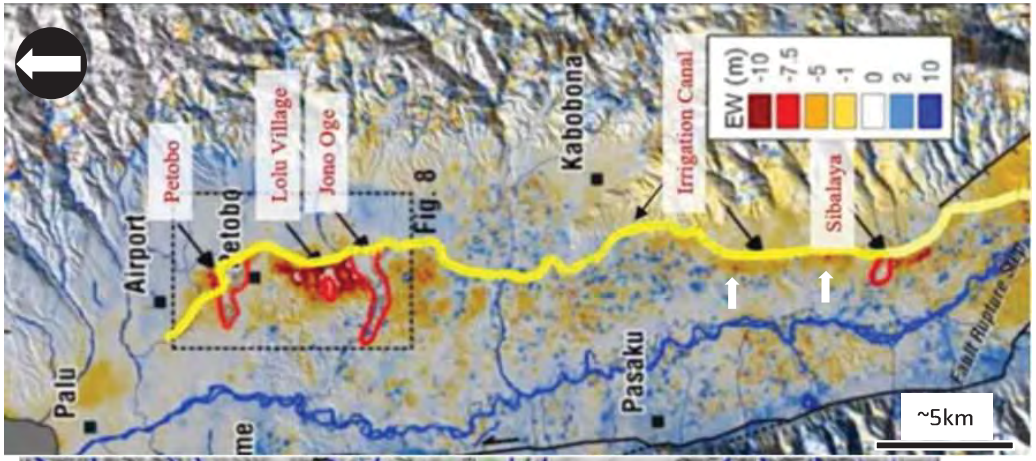


Figure 2: Observations of lateral movement (where minus figures indicate movement to the west, and positive figures indicate movement to the east) interpreted from optical satellite data in the Palu Basin (GEER, 2019 (adapted from Valkaniotis et. al., 2018))[b]

Figure 3: Nalodo occurrences and lateral flow locations (JICA, 2019) [a]

Sources:

(a) JICA Study Team (2019) Brief Explanation of "Nalodo" Assessment and Mitigation Presentation

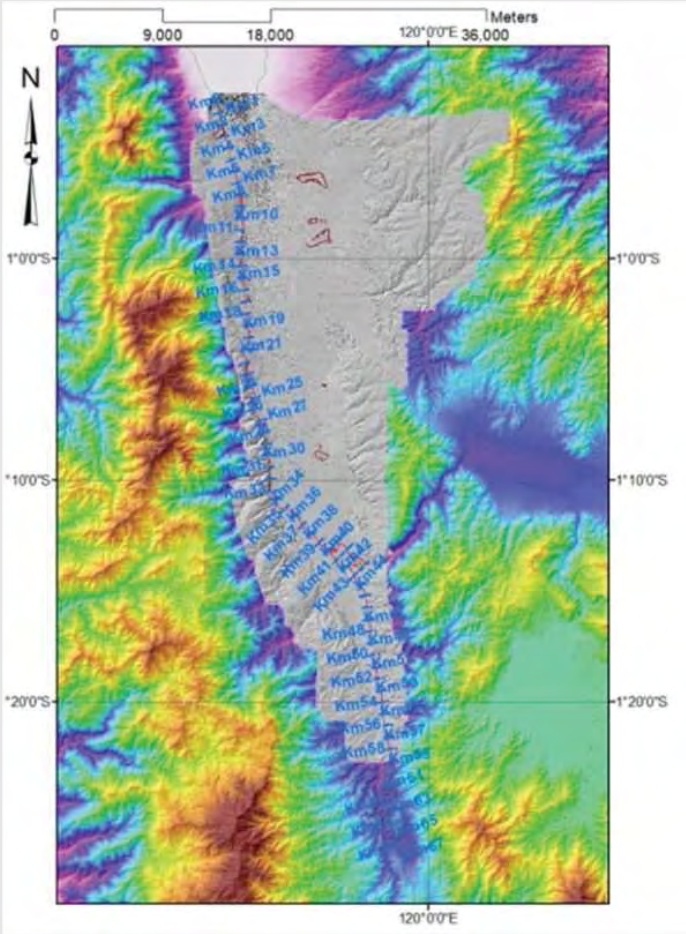
(b) GEER (Geotechnical Extreme Events Reconnaissance), 2019. The 28 September 2018 M7.5 Palu-Donggala, Indonesia Earthquake, Version 1.0. <http://learningfromearthquakes.org/2018-09-28-palu-indonesia/images/2018_09_28_palu_indonesia/pdfs/GEER_Palu_Version_1.pdf> (accessed January 2021).

Towards Resilience for the remainder of the canal

- The risk of this Sibalaya scenario repeating elsewhere in the future is considered high.
- We need to target other location where there were signs of flow.
- The role of the lower zone needs better definition –detection of confining layers
- To better understand these issues further studies relating to analysis of residual strength, slope angles, consequences of failure of canal (secondary & tertiary) are undergoing.

Other considerations

- LIDAR could prove invaluable with additional control mounts on the concrete walls to help with accurate spatial correction and control to pinpoint these into the future.
- Focus asset monitoring into the future, so that we can pre-empt failure, and maintain the canal flowing



Summary

- The slip in the area is very complex and driven by several factors (upper saturated zone and a lower natural water saturated zone)
- Solutions developed will need to be earthquake resistant and also provide resilience against future events.
- Several options were presented with their advantages and disadvantages
- Most likely the best solution is **straight through pipework/straight through open channel - combined resistance and resilience solution with likely good performance characteristics and good protection relative to safeguarding life**
- Further design work being undertaken

MOTT MACDONALD

THANKS

Memo of Meeting

Project title	Project for Development of Regional Disaster Risk Resilience Plan in Central Sulawesi
Date	Januari 21, 2021 (Thu) 14:00-18:00 WITA
Location	Virtual meeting via Zoom
Attendees	Force Task for Central Sulawesi Disaster Management, Ministry of PUPR : Mr. Arie Setiadi Moerwanto (Chairperson) Head of Sulawesi River Basin III (BWS III) Head of Sub-Directorate of Management of Foreign Loans and Grants Directorate of Irrigation and Swamps : Head of Regional Sub-Directorate III Head of Sub-Directorate of Technical Planning Expert Panel of Gumbasa Irrigation Reconstruction/ PUSGEN : Prof. Dr. Ir. Masyhur Irsyam, MSE Prof. Ir. Iswandi Imran MA.Sc., Ph.D Prof. Dr. Ir. Teuku Faisal Fathani, Ph.D Ir. Lutfi Faizal Mr. Mahdi Ibrahim ST., MT Technical Advisor Team : Ir. Sokrasno, Dipl. HE Ir. Eko Subekti, Dipl. HE (HATHI) Ir. Bistok Sigalingging, M.Sc Ir. Ferdinand Pakpahan, M.E Director team : - Nita Yuliati, ST., M.T - Elkha Fathur Anugrah Madjojo, ST Treasurer of Force Task of The Directorate of Irrigation and Swamp Leader Project Management Consultant Consultant Team Management Team ADB Team : Mr. Pieter Smidth Mr. David Meigh Mr. Eric ADB Team for Gumbasa Irrigation Project, Palu: Mr. Mahendra Ras (Team Leader)

	Mr. Endang Sukandar (Coordinator) Mr. Widji Sejati (Structural Design Engineer) Mr. Djoko Santoso (Hydrological Design Engineer) Mr. Joko Budi (Hydrological Design Engineer) Dr. Barnali Ghosh (Geotechnical Liquefaction Expert, London) Dr. Sukirman (Geotechnical, Tadulako University) JICA Team Jakarta JICA Team Palu
Objective of Meeting	Discussion and Sharing of the Detail Rehabilitation Design Concept of Gumbasa Irrigation Dam (Package 1A) and BGKn 7-24 Channel (Pckage 2) on Engineering Service Prject (ESP) of Gumbasa
Meeting material	Presentation Files : • Presentasi Bendung 21 Januari 2021.ppt • Sibalaya-PROPOSED DESIGN Main Canal_REV_6 • Package 2 PROPOSED DESIGN Main Canal (21 Jan 2021)

Summarizes

Liquefaction Countermeasure

- It is rather difficult to control all of the liquefaction mechanism, and what can be done to overcome it is to decrease the groundwater level to a safe level. Some of the handling matters include are: all sewer systems will be made as waterproofed for both primary and secondary, also tertiary channels. Along with this, we will also manage the water table, lowering the level of the Palu river so that the flow can be managed properly in a series with the Gumbasa system. This session will be discussed in a special section with Balai Air Tanah (Mr. Ahmad Taufiq, Ph.D).

Irrigation Canal Design Criteria in Sibalaya

- Acknowledging that with perforation there will be cooperation with the Department of Agriculture, P3A, and others so that they can move to a plant that requires less water. However, what needs to be predicted is that the irrigation canal area is close to the candidate for the state capital, so the urge to plant rice is high. SRI operating system will be considered.
- The lining will be pushed with a charge of 70% plus 10 cm.
  If it can only be disturbed for two weeks, then it needs an agreement that this will be pushed but only the embankment because the simplest and the problem of land acquisition is not there. In relation to disaster/seismicity, it refers to KP-06 (Planning criteria six).
- Agreed with the conventional embankment. The option that has been selected is that use a normal heap. And then it is necessary to consider whether it can be shifted move towards the right (East) or not. Need to communicate with local Regent.
- There needs to be a mutual agreement in the use of the design criteria which suitable for the structure. For the design, agreed to use a 50% deterministic approach and adjust it which is

suggested by PUSGEN, due to the distance of the location closes to the fault. PUSGEN team agreed will help to have the result.

- For the structure lining, it needs confirmation and it needs to be shown with a water pass (by doing the ground survey) that the datum after the disaster has not changed. Check the parameters for the structure
- The structure needs to consider what type of material is used and also where is the disposal area.

Land Acquisition

- There is no problem with land acquisition, the district government of Sigi is ready to help and has been communicated by Mr. Arie. Consultant team should communicate with the Regent.

Contents

- Pre-Opening by Mrs. Asmelita (Regional Sub-Directorate III, Irrigation and Swamps)
- Opening Speech & Presentation by Mr. Arie Setiadi Moerwanto
- The challenges faced in the construction of Gumbasa Irrigation are quite interesting. In the future will discuss the structure of Sibalaya & JonoOge and the drainage in the Petobo area in relation to the liquefaction area.
- The initial studies have been done by Dr. Tada and team and several researchers also still continuing the studies in liquefaction :
  - From Dr. Tada research, there are a few notes regarding the liquefaction related to the presence of a very shallow groundwater level, the existence of confined aquifer, low slope (even though not perfectly horizontal), loose sandy soil layer with very low Nsp value and there is impermeability layer between them (low permeable cap). ***From some of these things it is rather difficult to control all of it, and what can be done to overcome it is to decrease the groundwater level to a safe level. Some of the handling matters include are: all sewer systems will be made as waterproofed for both primary and secondary, also tertiary channels. Along with this, we will also manage the water table, lowering the level of the Palu river so that the flow can be managed properly in a series with the Gumbasa system.***
  - The experience in Palu has also been compiled in the form of a book by UNISDR entitled "Understanding Liquefaction Hazard and Reducing Associated Risk" with ongoing research.
  - Groundwater Engineering Center is also doing modeling related to Groundwater which is still ongoing. This study uses borehole data (JICA, 17), geoelectric (15 cross-sections), other boreholes from the hydrogeological map (9 boreholes) (Discuss in a special section).
- ***Addressing the problems faced regarding the construction of Gumbasa and overview of problems in damage bridges***
  - Gumbasa irrigation function exposure of 7000 ha, has functioned 1070 ha, where Gumbasa has been equipped with a refurbished center and secondary and tertiary channels that have been running. In this case it has not changed too much because the minister asked to save money to help development in West Sulawesi (the most recent disaster area).

- Showing of the damaged condition of the Lompio, Talaki, Tompe, and Dolago bridges that have shifted. So it is necessary to be careful for structures like this.
- Showing of the damage suffered by Wuno Aqueduct BGKn36a. The handling is by placing it in its original place and repairing the water stock. The same thing was experienced at Paneki Aqueduct BGKn 48a.

- ***Emphasizing that the rehabilitation of irrigation areas cannot stand alone, there are many things that need to be considered, among others, in terms of design needs to be improved. Asking for input from the expert panel and many parties to improve the development program and need a comprehensive approach for the program.***

- Presentation of ADB Consultant Team, Opening by Team Leader (Mr. Ras Mahe)
- Introduction of the consulting team
- Describing the program situation in pendemic condition
- Presentation of Silabaya Design by Dr Barnali Ghosh & Dr. Sukiman

(**Material : 1. Sibalaya-PROPOSED DESIGN Main Canal_REV_6.ppt**)

- An illustration of soil movement in the Sibalaya area by showing the results of a landslide study that occurred on the side of the upper canal and debris occurred in 2018. The upper area experienced a total decline of around 6-7m. From about 330 meters of irrigation development planning area, land displacement has occurred (slides 4-7). The slip of the soil is very complex and the general geotechnical stability of the entire area shown the movement along the canal dam. The liquefaction was exist but some other mechanism has begun even before the EQ, or due to the long term canal leakage on unstable block from the liquefaction section. It can be seen from the trenches by Japanese researchers results.
- Description of the strategy in dealing with channels through the liquefaction area. ***The solution developed should focus on Resistance and Resilience***.
- The BBB development approach uses SLS and ULS, where ***the focus is more on the ULS approach, the design follows the earthquake resistance of 7.5 SR, and PGA 0.5g - 0.75g for long period. Proposing a suitable canal for the region, both approaches will be reviewed.*** (Slide 9-10)
- Describing on geotechnical existing data uses and design criteria for the development and the planning. Sub-consultant has been doing several soil investigations, some ongoing, and will start in the next 1-2 weeks. Several used data inputs from other research data such as PUSAIR. For the construction development planning in using the same alignment and the need for soil stack in the existing area.
- For Sibalaya, the typical design uses the same type of design as the main canal, it's just that because ***Sibalaya is in a high enough position, it is necessary to modify the canal joints (BGKn 1-7 almost 8 m). So that it is proposed to be in two parts, to be about 4m.***
- Description of 7 options. ***326m the Sibalaya area will be specially treated***, with several options plan (There are 7 options - PPT). The simplest option is option one which is only compaction and backfilling with riprap in front with the slope ration is 1:3. Option two is constrained by materials that have to be ordered from outside the region. Option four is alignment revise can save money if the required landfill is too large, where the displacement soil (about 20 m) is denser with a value of Nspt > 30. If this option is used it is necessary to meet with the local government.
- ***There is land acquisition problem regarding this option one & four, due to need clearing and land ability.***

Discussion

Mr. Arie Setiadi Moerwanto

- There is special handling related to Gumbasa in the Sibalaya area, the design is mixed and uses treatment design options such as bridges because of the idea that earthquake-resistant structures are achieved.
- ***There is no problem with land acquisition, the district government. Sigi is ready to help and has been communicated***
- On the downstream side there is a road affected by liquefaction. PUSGEN asked for a column design but the price went up. If the gutter will treat as a bridge it can't collapse, if there is deformation it will be topped up again.
- ***Design criteria encourage simple structure, water will also be lowered to handle liquefaction. Will use releasement, by building wells, so that water pressure can be released.***

Prof. Mahsyur Irsyam, PUSGEN

- An existing condition is required. In the existing condition, we know that the extreme liquefaction occurred in this area, and also there is an area that is not affected extremely The construction is passing the extreme location and non-extreme location and we want to build back better.
- We have to know first what is the targeted performance; the design criteria which will depend on the target performance. What is the standard that could be adopted to liquefaction area? What is the location extremely affected, 350 we used everything to follow the standard, and the rest that we do not know will also occur in the future will be treated equally or differently? How we assume the future only occurs at the past liquefaction area. This is the thing that we need to decide first because this is the policy, will we treat equally or treat locally that follow the cost.
- We have to agree what is the design criteria that suitable for this structure. Due to Mr. Sukirman's explanation, he uses the acceleration which uses for building code, but the structure to construct is different, it is not a building but an irrigation canal. There needs to be a mutual agreement in the use of the design criteria; such as the slope stability in the design presentation is used building standard, not for dam standard. Need to be clarified and be agreed upon together.
- What is the design EQ will use for this structure? The recommendation for the new construction is we have to fulfill the design criteria, there are three possibilities: the acceleration just uses the recorded or use from the probabilistic map. The recommendation use standard for structure maybe 500. And the third is to use a deterministic that assumes maximum magnitude will open again in the future. We come to an agreement first which is the return period with design EQ values, slope stability, safety factor liquefaction, safety level for the groundwater, and the performance level.
- What is the safety factor for liquefaction, we allow it or not.
- Totally extreme, not extreme, or the transition of that
- Recommendation for soil condition, divide into two zonings: high extreme affected, no affected at all (treat as lining), and/ or maybe there will be a transition for few meters if needed.
- Suggest building a consensus from the meeting and the design will follow that consensus
- Need to check the soil investigation, is it outside or inside the construction area. (As for the confirmation from Dr. Barnali, the geotechnical data that ADB gets is limited to the research in the past which done by JICA).

- Information the Pasigala channel uses a deterministic range between 0.6 - 0.9 (confirmation on the ground motion map)
- Considering to use 50% deterministic. (Mr. Arie asking for their helping in resulting the deterministic and answered by Prof. Iksam is approving, that they are ready for helping and mentioned that Mr. Lutfie, he is the leader in this matters).
- We have to decide water level elevation because from this we can calculate the cause of liquefaction

Prof. Iswandi Imran, ITB

- If it is deterministic or based on the recording that is used as a reference, of course, there is an additional safety factor.
- From the length of the affected structure, of course, there is a transition zone that is not affected by extreme mechanisms. How is the treatment, is it included in the existing 330 m length, and how is the determination of 330 m, based on the current affected conditions. If area-based is affected, it means that there should be additional corridors just in case.
- Design based on resilience, which can provide a long service life, which can cover the harsh natural conditions. There needs to be quantitative data, including in determining target performance, such as controllable damage that has been attempted to be controlled since planning, which poses a quantitative question of how much damage can be handled. It is necessary to have a reference in terms of the level of damage quantity. Including servicing and operation (level without damage or damage under control), and so on. ***It needs to be synchronized between the earthquake level and the resulting performance. When you get it in quantity, it will be easy to measure.***
- From several alternative options, option 6 uses a bridge structure. For the price, it is definitely very expensive. However, in option 6, it is stated that resilience is not easily repairable, but this actually depends on the design. For example, so that the level of ease of repair is high, then allocate it to an easily accessible place. The foundation system is made stronger than the above structure so that it is easier to access. This also applies to the same similar designs, everything can be planned from the beginning, both the place and the level to get better resilience. Likewise for the upper and lower cantilever walls in option 4. The design must be considered.

Prof. Faisal Fathani, UGM

- If we see the study results from the JICA study team, the level of liquefaction is not only in the red zone but also in the orange zone. We need to make sure the alignment of 330 m. How about the alignment which passes the orange zone. We need to think of the transition zone (orange zone), there needs to be a transition location to a channel that is built under normal conditions
- It is necessary to think about where the stockpile will be taken from and the data also needs to be corrected because it is similar to the soil conditions at the site. The shift is not too much different.
- Assumption of groundwater level before and after an earthquake. It is necessary to re-verify the level of groundwater above the surface. The existing soil conditions in Sibalaya are fertile soils. When the alternatives have been described, the groundwater level is in which position because it will affect the stability of the slopes to be analyzed, either focusing on the safety factor or on its deformation.

- In the design calculation, there is the use of geosynthetics in option 3, by using the geosynthetic design it can actually be arranged so as not to cut or tighter. Cantilever use is also very expensive.
- ***Regarding alternatives if possible shifted about 20m in order to reduce embankment and potential liquefaction, this option is actually the best option. Depending on the relief of land acquisition.***

Mr. Mahdi Ibrahim ST., MT

- Many alternatives have been described, but if possible choose one that is not too complicated. ***It is a possibility to choose options that are simple and that are easy to find material***. From the previous explanation, there is already a section for handling groundwater levels, where when it is able to handle groundwater, the slope can still be adjusted. Called it manner deformation, where slope subsidence can still be allowed approximately 15 cm deformation is still possible, but this is also an agreement. (The information from Mr. Sukirman, the current groundwater level is around 17.6m),
- From the SLS and ULS analysis, it is possible to use a lower one. The criteria used can use deformation criteria. If use 2500 for slope stability is too big and the criteria don't need to be up to 1.1. If using ULS because the return period is too large, then you can use <1 but the deformation is limited. For the safety factor, use the SLS standard whose service is> 1.1. (Mr. Mahdi). (Additional comment : using dynamic analysis (Prof. Mahsyur Irsyam))

Mr. Lutfi

- It is necessary to clarify the technical details chosen because they are related to costs, so that not get a large initial cost because of the technology chosen.
- The existing seismic criteria for the typical design uses the same distance approach with Pasigala canal. Need to check the distance from the main fault. The acceleration needs to be considered and to be checked again depend on the position. (Ir. Lutfi Faizal). (Additional comment : If using the same as Pasigala, those that cut right on-location use 0.9, and those that stay away from use accelerations of up to 0.5 depending on their position. (Prof. Mahsyur Irsyam)).

Mr. Arie Setiadi Moerwanto

- At this time, we are comparing bridges to buildings structure. In the case of this main channel, it can be considered when a major disaster occurs how long the (minor) damage to the channel is allowed to be disturbed so that in its design it can be measured. For example a bridge, a bridge oprit can be damaged but the bridge must not collapse. (Asking Technical Advisor Team for consideration, because this channel cannot be a leak) If it is designed to be a gutter it will look like a bridge, but if the land is heaped up then it is only a pile so one day it can be topped up again.
- Regarding the transition area, in this case, it can be explained as there are embankments and existing ones. The transition will be seen whether the joint is allowed in this area or between segments of the concrete layer given a water stock expansion joint so that if something happens, it will just play there. The structure is given an additional joint.

Ir. Soekrasno, Dipl. HE (Technical Advisor Team)

- In terms of hydraulic irrigation, proposing that the parties hold irrigation planning criteria in 2013. Regarding questions about the building code regarding water resources (related

to safety factors, concepts of cargo, earthquake coefficients, etc.) please review the planning criteria no.6 of 2013 Building code does not need to be used except for large structures such as gutters and bars that have to be supported by buildings closer to the criteria of DGH, so it is agreed to be used. As long as it is still closely related to irrigation, it is proposed to use KP-06.

- Regarding water that cannot leak too much so that the canal is in the lining, this is very good, but it needs to be reminded that if it is only to hold water in the channel, the primary, secondary and tertiary channels actually only cover a third, about 15% of the total rice fields. If ordinary rice fields only follow floating irrigation, this means that the downward temperature is still large, covering an area of 95% and the floating irrigation system used by farmers from rice processing to before harvest. Can it lead farmers not to use floating irrigation, for example using horticulture? My suggestion is to use the NTB model with scaffolding (dry rice) or use the SRI (System of Rice Intensification) model system in which the cultivation is suppressed. But normal floating rice, circulation is 3mm per day for this area.
- Regarding lining, there is no need to go up because it is too expensive. Please consider when the irrigation discharge is 100% or 70%.
- Under normal conditions, we consider 100% input plus 10 cm. Above this limit is the bad soil limit. There are three inputs, namely in the bad soil, the lining gives opportunities for other creatures such as frogs and living plants. This method is for operational maintenance so that there are activities to clean the grass instead of being given full lining.
- If the additional charge of 100% plus 10cm is too expensive, ADB will not object to the 100% charge plus 10cm. Because in water scheduling, 100% charge only two or three times a year. We agree that 70% of recharge is considered.
- Whatever structure is chosen, it is necessary to consider three possible risks, namely: 1. Possibility of Sediment accumulation, 2. Possibility of trust, 3. Always consider our structure. To overcome the sediment along with this structure, I suggest constructing secondary sediments before the main structure as well. Post-secondary sediment, you also have to construct a side split building in case of overtopping, because the structure possibility is blocked by the threshing or downstream gate from divide building so that maybe the block is by floating debris so that the water may rise or be overtopping. Another thing is shorting before the structure, I suggest three things treshlet, secondary and side sediments ... In case there are so many blocks in the structure, the sluice officer will take the floating debris then the hope is that the city government or district government will pick up the waste, so I suggest there is a trash can. When picking up the trash, there was rainy and hot weather, I suggest you have a shelter building that is open to a small size (about 2 x 3 m).
- If the structure is made of river stone, the maximum speed is 2m, if it is made of concrete, it is 3m. Because of this structure, my advice is to approach the speed in this building between 2-3 m, because if the speed is high, the crossing area can be small so that the dimensions are reduced and the cost is also cheaper.
- I suggest that please consider the tractive cost from the dam to tertiary, this cost should be designed slightly increasing or minimum the same. Please check. If not checked, the sediment will be too much.
- Regarding the inspection road in Sibalaya, the inspection road will use the village road next to it. But if there is an embankment, can it be used on top of the pile as an inspection road if you choose option three, so you don't need to use the village road.
- Especially for pipes, if this option is chosen then it is necessary to take care of the sediment. Three structures in front of the pipe must exist.

- Regarding how long it can be disturbed, then if we refer to the general condition, it can only refer to two to three weeks.

Mr. Arie Setiadi Moerwanto

- Acknowledging that with perforation there will be cooperation with the Department of Agriculture, P3A, and others so that they can move to a plant that requires less water. However, what needs to be predicted is that the irrigation canal area is close to the candidate for the state capital, so the urge to plant rice is high. Earlier there was an SRI operating system.
- The lining will be pushed with a charge of 70% plus 10 cm.
- If it can only be disturbed for two weeks, then it needs an agreement that this will be pushed but only the embankment because the simplest and the problem of land acquisition is not there. In relation to disaster/seismicity, it refers to KP06.
- We agreed to use 50% deterministic, because this is very close to the fault, so it is a special condition. What consultants use is too high, later asking Prof. Mahsyur Irsyam and team for this.

Ir. Eko Subekti, Dipl. HE (Technical Advisor Team from HATHI)

- Thought that the Gumbasa banks are generated from residual soil. The groundwater in this area is relatively shallow. Prior to the structure, it should be necessary to study first and need to be convinced first about this. The presentation from the Consultant Team was too broad and in the opinion, it lacked detail; the properties were not disclosed.
- The structure needs to consider what type of material is used because as far as I know raw material if the coefficient of needing power is 5 it's difficult, tends to be silty or sandy, it tends to be mixed. So need to be careful. The structural stability of the embankment, in my opinion, this area concerns areas that are easily saturated. Reading macro geology must be mature so that you do not choose the wrong choice. If you look at options 5 or 6, it is clear that the liquefaction is generated from shaking water so that particles are explosive, which is not an easy thing. The point must be supported by complete data.

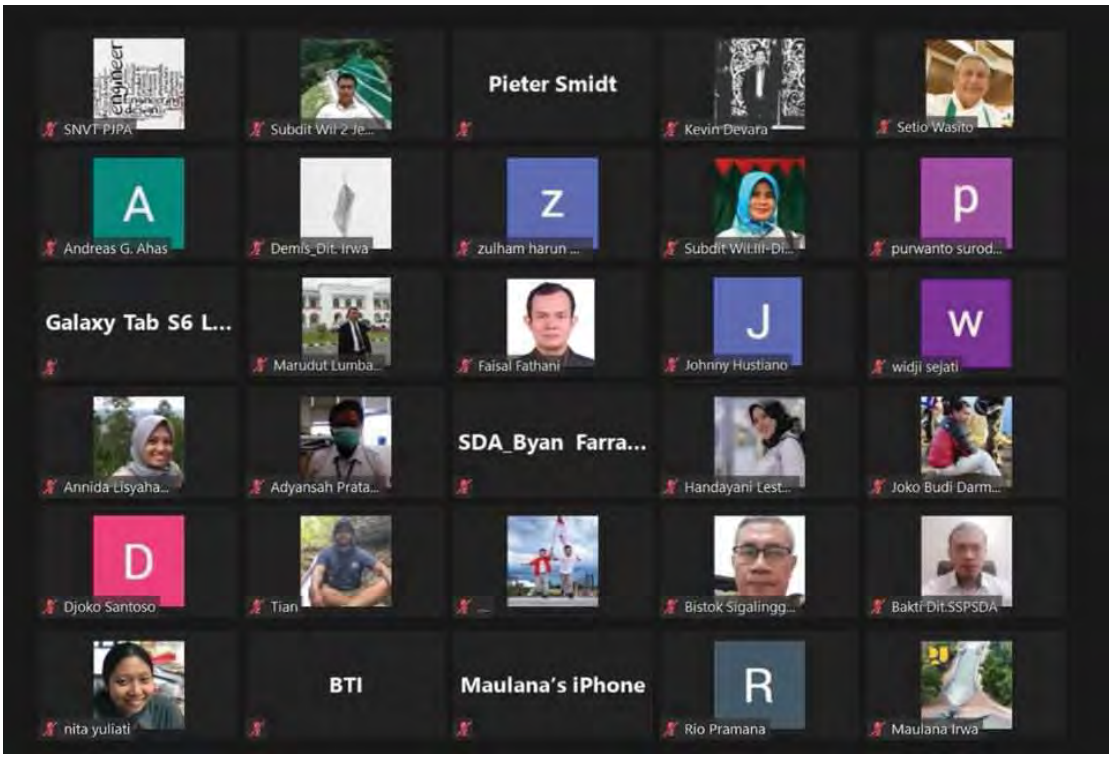
Ir. Bistok Sigalingging, M.Sc

- Asking whether all the elevations shown are referring to the updated Lidar map, because the elevation of the structure may change according to the needs of the irrigation elevation it serves. Have you checked with a datum that assumes that the dam has not changed, the elevation will refer to it. It needs confirmation and it needs to be shown with a water pass that the datum after the disaster has not changed.
- The assumption is that until now, the lining other than the liquefaction area has not changed so that the existing one is maintained. Whether this has been checked or not, it is necessary to have a direct checking survey with a ground survey. If the result of changes in the contour of the land is getting bigger, will the existing elevation be maintained?
- One of the problems is also reducing groundwater, whether irrigation areas that are no longer reachable by irrigation should not be served by pumps.

Ir. Ferdinand Pakpahan, M.E

- About the embankment, asking the consultant team to do the public consultant, are they agree if the construction shifted the alignment to the right side to have a more stable location upward the current Sibalaya channel.
- About the material and the disposal
- Do the evaluation with water balance and planting pattern.

Documentation



[END]

MOTT MACDONALD

ADB

Accelerating Infrastructure Delivery through Better Engineering Services Project (ESP)

PPC For Gumbasa Irrigation System and Its Facilities, Palu and Sigi Distric, Central Sulawesi Province

ADB Loan No.3455-INO

Euroconsult Mott MacDonald & Associates

JICA Office
Jl. Towua II, Palu Selatan
Kota Palu, Prop. Sulawesi Tengah

Attn. Pimpinan JICA
Prop. Sul-Teng

Perihal : Permohonan Permintaan Data

Date
25 January 2021

Our Reference
25/Jan/Gumbasa-2021

Palu Office:
Jalan Abdul Rahman Saleh No. 21,
North Birobuli 94231, South Palu,
Central Sulawesi, INDONESIA
Tel. 0451.8190423

Jakarta Office:
Jl. Erlangga 3 No. 16
Kebayoran Baru 12190
Jakarta Selatan, INDONESIA

Dengan Hormat,

Sehubungan dengan Kegiatan **Perencanaan Master Plan, Feasibility Study, dan DED** yang merupakan bagian dari Proyek Rehabilitasi dan Rekonstruksi Irigasi Gumbasa, melalui surat ini kami mengajukan permohonan permintaan :

1. Data Air Tanah
2. Data Investigasi Tanah
3. Rencana Master Plan
4. Data Geologi
5. Data Potensi Likuifaksi

Demikian permohonan ini kami sampaikan, atas dukungan dan kerjasamanya diucapkan terima kasih.

Hormat kami,

p.p. **Rasiah Mahendrarajah**
Team Leader

25/01 2021

Cc: - Arsip

JICA & YACHIYO ENGINEERING Co., Ltd
THE PROJECT FOR DEVELOPMENT OF REGIONAL DISASTER RISK RESILIENCE PLAN IN CENTRAL SULAWESI
GRAHA TOWUA A8
Jl. Towua, Tatura Selatan, Palu Selatan
Kota Palu - INDONESIA

3BCS PROJECT
BUILD BACK BETTER CENTRAL SULAWESI

RECEIPT OF ~~GOODS~~ / DOCUMENTS

Has been received from : Palu Project Office
Type : ~~Equipment /~~ Document

No.	Description	Q'ty	Remarks
~~Equipment /~~ Documents :			
1	Summary Progress Report DRR PROJECT Dec 2019		Soft Copy
2	Detailed version Sum Progress Report DRR PROJECT Dec 2019		Soft Copy
3	Appendix of Sumas Progress Report DRR Project Dec 2019		Soft Copy
4	Summary Progress Report - 2 DRR Project Dec 2020		Soft Copy
5	Appendix of Summary Progress Report-2 Dec 2020		Soft Copy
6			
7			
8			
9			
10			

Palu, 25 Jan. 2021

Submitted by

(DHIKA)

Received by

(Annida Usyatadah)
ADB TEAM

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DIREKTORAT IRIGASI DAN RAWA
Jln. Pattimura 20, Kebayoran Baru, Jakarta Selatan 12110, Telp. : (021) 7394323, Fax. : (021) 7243633

Nomor : Um 0102-Ai/17 Jakarta, 25 Januari 2021
Sifat : Biasa
Lampiran : 1 (satu) lembar
Hal : Undangan Pembahasan Finalisasi Detail Desain Rehabilitasi Bendung Gumbasa (*Package 1A*) pada Pekerjaan *Engineering Services Project* (ESP) Gumbasa

Yth.
(Daftar Terlampir)
di
Tempat

Dalam rangka pelaksanaan pekerjaan *Engineering Services Project* (ESP Gumbasa), kami mengundang Bapak/Ibu dalam pembahasan Finalisasi Detail Desain Bendung Gumbasa (*Package 1A*) yang akan dilaksanakan secara *video conference* melalui **aplikasi Zoom** pada:

Hari/tanggal	: Rabu/ 27 Januari 2021
Waktu	: pukul 13.00 WIB - selesai
Agenda	: Pembahasan Detail Desain Rehabilitasi Bendung Gumbasa (*Package 1A*) pada Pekerjaan *Engineering Services Project* (*ESP*) Gumbasa
Meeting ID	: **828 4382 7009**
Passcode	: **gumbasa**

Mengingat pentingnya kegiatan tersebut, dimohon kesediaan Bapak dan Ibu untuk bergabung tepat waktu dalam *meeting room* yang telah disediakan. Untuk konfirmasi lebih lanjut dapat disampaikan melalui Saudara Elkha (081320016740).

Demikian disampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.

Direktur Irigasi dan Rawa,

KEMENTERIAN PEKERJAAN UMUM DIREKTORAT JENDERAL SDA DIREKTORAT IRIGASI DAN RAWA

Ir. Suparji, S.ST., M.T.
NIP. 196212311998031030

Lampiran Surat Undangan
Nomor : UM 0102-Ar/17
Tanggal : 25 Januari 2021

DAFTAR PEJABAT/ PEGAWAI YANG DIUNDANG

1. Ketua Satgas Penanggulangan Bencana Sulawesi Tengah Kementerian PUPR;
2. Kepala Balai Wilayah Sungai Sulawesi III;
3. Kasubdit Pengelolaan Pinjaman dan Hibah Luar Negeri,Dit. SSPSDA;
4. Kasubdit Perencanaan Teknis, Dit. Irigasi dan Rawa;
5. Kasubdit Wilayah III, Dit. Irigasi dan Rawa;
6. **Tim Advis Teknis:**
   - Ir. Soekrasno, Dipl. HE;
   - Ir. Eko Subekti, Dipl. HE.;
   - Ir. Bistok Sigalingging, M.Sc.;
   - Ir. Ferdinand Pakpahan, M.E.;
7. **Tim Direksi** Pekerjaan *Project Preparation Consultant (PPC) for Gumbasa Irrigation System and Its Facilities, Palu and Sigi District, Central Sulawesi Province*:
   - Rahmat Suria Lubis, S.T., M.T.;
   - Devi Sri Maulana, S.T., M.T.;
   - Nita Yuliati, S.T., M.T.;
   - Arnold M. Ratu, S.E., S.T., M.T.;
   - Drs. Edison, S.T., M.T.;
   - Dadan Rahmandani, S.T., MPSDA.;
   - Elkha Fathur Anugrah Madjodjo, S.T.;
8. Bendahara Satker Direktorat Irigasi dan Rawa;
9. *Leader Project Management Consultant*;
10. **Tim Konsultan** Pekerjaan *Project Preparation Consultant (PPC) for Gumbasa Irrigation System and Its Facilities, Palu and Sigi District, Central Sulawesi Province*;
11. **Tim Manajemen** Pekerjaan *Project Preparation Consultant (PPC) for Gumbasa Irrigation System and Its Facilities, Palu and Sigi District, Central Sulawesi Province*;
12. **Tim ADB;**
13. **Tim JICA;**

MOTT MACDONALD

Gumbasa Irrigation Project

Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province

01 December 2020

ID ADB Gumbasa Irrigation

II-3-13-850

MOTT MACDONALD

SUMBER DATA :

1. Design Note “Dumoga and Gumbasa Irrigation Projects” tahun 1978 (Binnie and Partners Consulting Engineers)
2. Pekerjaan Pengukuran dan Perencanaan Special Maintenance tahun 1993 (PT. Isuda Parama)
3. As Build Drawing Rehabilitasi Jaringan Irigasi DI Gumbasa tahun 2018 (PT. Adhi Karya)
4. Hasil Inventarisasi dan Pengukuran Bendung

DATA TEKNIS BENDUNG :

1. Lebar total : 76,00 m
2. Elevasi mercu : 92,11 (existing)
3. Elevasi dinding penahan : 95,85 (existing)
4. Elevasi dasar kolam olak : 86,05 (existing)
5. Elevasi andsill bendung : 86,85
6. Elevasi dasar sungai di ujung pembilas sandtrap : 85,67
7. Analisa Hidrologi :
   - Debit banjir rencana Q1000 : 1.200,00 m3/dt
   - Debit banjir rencana Q100 : 752,30 m3/dt
   - Debit banjir rencana Q50 : 630,50 m3/dt
   - Debit banjir rencana Q25 : 516,60 m3/dt
   - Debit banjir tahunan : 52,10 m3/dt
   - DR : 2,315 l/dt/ha
8. Luas areal irigasi (study terdahulu) : 8.180 ha

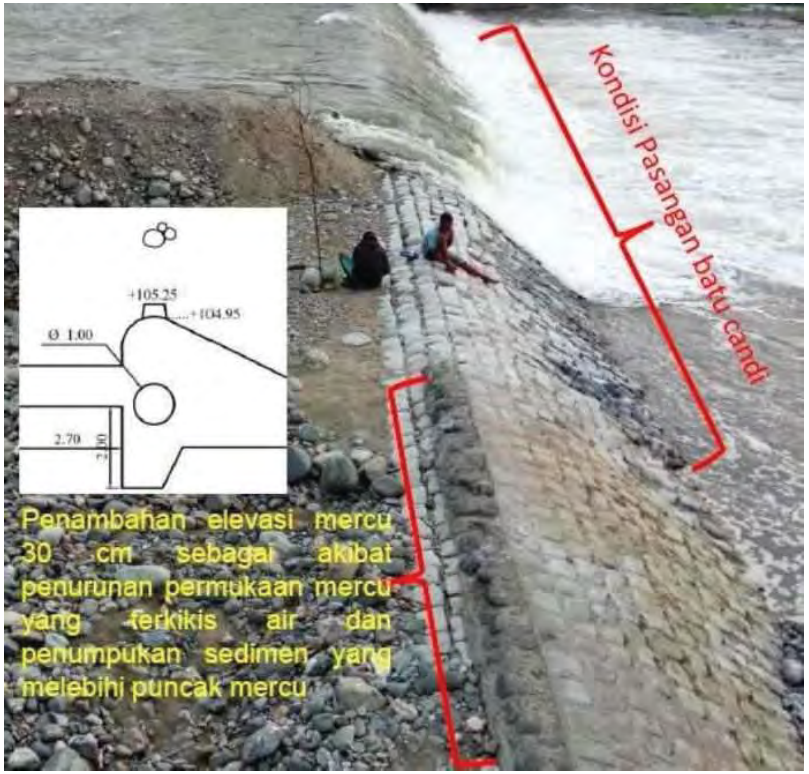
PERMASALAHAN :

1. Mercu bendung sebagian sudah rusak
2. Dinding hilir sebelah kiri dan kanan retak
3. Sayap hulu sebelah kiri sebagian rusak (pasangan batu keropos)
4. Terdapat sedimentasi batu-batuan besar di hulu bendung
5. Pintu penguras bendung sering terkena kayu besar pada saat banjir
6. Kondisi pintu penguras sudah tidak sempurna
7. Terjadi gerusan ditubuh bendung
8. Gerusan dihilir kolam olak
9. Hilir sandtrap terjadi sedimentasi dari material banjir di bukit sebelah kanan saluran induk
10. Tanggul banjir sebelah kiri mulai dari boulder rack-1 ke arah hilir sebagian besar tergerus dan terputus.
11. Kantor operasi(2 lantai layak sebagai kantor operasi water center office)
12. Mobil dan kendaraan roda 2 kegiatan operassi dan sarana pendukung lainnya
13. Mebeler kantor, computer, instalasi listrik dan penerangan lainnya, genset, alat berat dll.
14. LANDSCAPE

LINGKUP PEKERJAAN :

No.	LINGKUP PEKERJAAN	HASIL DISKUSI
1	Melapisi (selimut) bendung tebal 50 cm dengan beton K500	OK, mutu beton ganti K350
2	Bagian dinding yang retak/rusak akan di grouting	OK
3	Sayap yang keropos dibongkar dan dibuat baru	OK
4	Membuat pintu penguras batu dengan saluran pengarah (skimming weir)	Drop
5	Membuat trashrack untuk melindungi pintu penguras & intake	Sket pak Arie
6	Mengganti pintu penguras dengan yang baru	OK
7	Memperpanjang kolam olak dan tinggi endsill	Tidak recommended
8	Melindungi hilir bendung dengan rip-rap	Ganti boulder
9	Membuat saluran pembilas sandtrap baru dan saluran pembilas sandtrap yang lama difungsikan untuk mengalirkan sedimen dari bukit sebelah kiri	OK, check elevasi sungai
10	Membuat perlindungan sungai pada lokasi tanggul banjir sebelah kiri dan memperbaiki tanggul banjir yang rusak.	OK tanggul naik maka tanggul juga harus naik

DOKUMENTASI PEKERJAAN TERDAHULU :



DOKUMENTASI SAAT INI :

TANGGUL BANJIR KIRI

Lokasi : Antara Boulder Rack ke-2 dan Boulder Rack ke-3

Lokasi : Antara Groundsill ke-2 dan Groundsill ke-3

TANGGUL BANJIR KIRI

Lokasi : Antara Boulder Rack ke-1 dan Boulder Rack ke-2

Lokasi : Antara Boulder Rack ke-1 dan Boulder Rack ke-2

HULU BENDUNG

Lokasi : Boulder Rack ke-1

Lokasi : Boulder Rack ke-2

HULU BENDUNG

Lokasi : Boulder Rack ke-3

Lokasi : Antara Jembatan dan Talang PDAM PASIGALA

MERCU BENDUNG

Lokasi : Mercu Bendung dari Sebelah Kiri

Lokasi : Mercu Bendung dari Sebelah Kanan

HULU DAN HILIR MERCU BENDUNG

Lokasi : Hulu Mercu Bendung

Lokasi : Hilir Mercu Bendung

DINDING PENAHAN

Lokasi : Dinding Penahan Kanan

Lokasi : Dinding Penahan Kiri

PINTU DAN SAYAP HULU BENDUNG

Lokasi : Pintu Penguras dan Intake

Lokasi : Sayap Hulu Bendung Sebelah Kiri

SALURAN PEMBILAS SANDTRAP

Lokasi : Saluran Pembilas Sandtrap

Lokasi : Saluran Pembilas Sandtrap

ANALISA TEKNIS

ELEVASI MUKA AIR BANJIR DIATAS MERCU

No.	DEBIT BANJIR		LEBAR EFFEKTIF	ELEVASI MA	TINGGI JAGAAN	El. DINDING (DP)	
	Kala Ulang	Debit				(Hitungan)	(Existing)
		(m3/dt)	(m)		(m)		
1	1000 Tahun	1200,00	71,85	97,194	0,00	97,194	95,850
2	100 Tahun	752,30	72,27	95,461	0,70	96,161	95,850
3	50 Tahun	630,50	72,64	95,131	0,70	95,831	95,850

DOWNSTREAM BENDUNG

No.	DEBIT BANJIR		PAJANG KOLAM OLAK		TINGGI ENDSILL		RIPRAP	
	Kala Ulang	Debit	Desain	Existing	Desain	Existing	Panjang	Berat boulder
		(m3/dt)	(m)	(m)	(m)	(m)	(m)	(kg)
1	100 Tahun	752,30	10,50	8,50	0,80	0,50	6,00	781
2	50 Tahun	630,50	9,80	8,50	0,75	0,50	5,60	658

STABILITAS TERHADAP EROSI BAWAH BENDUNG

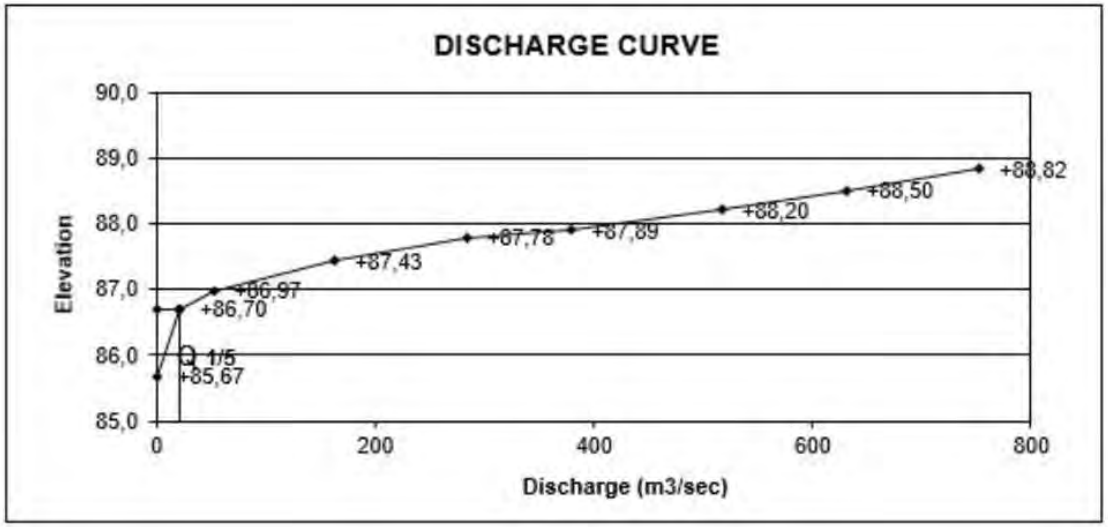
No.	DEBIT BANJIR		BLIGH						LANE					
	Kala Ulang	Debit	Normal	ΣV+ΣH	Note	Banjir	ΣV+ΣH	Note	Normal	ΣV+ΣH/3	Note	Banjir	ΣV+ΣH/3	Note
		(m3/dt)	(a)	(b)	(a) < (b)	(a)	(b)	(a) < (b)	(a)	(b)	(a) < (b)	(a)	(b)	(a) < (b)
1	100 Tahun	752,30	35,06	51,23	ok	71,79	92,78	ok	8,77	29,75	ok	17,95	49,79	ok
2	50 Tahun	630,50	38,62	51,23	ok	17,95	49,79	ok	9,65	29,75	ok	17,85	49,79	ok

Data-data Saluran Pembilas Sandtrap :

1. Debit pembilas : 1,2 x Qpenganbilan = 16,00 m3/dt
2. Kecepatan pembilasan : 2 m/dt
3. Koeffisien Strickler : 60 (pasangan batu)
4. Debit banjir tahunan : 52,10 m3/dt
5. Panjang saluran : 171 m
6. Elevasi dasar sungai di ujung pembilas : 85,67

Analisa Hidrolis Saluran Pembilas Sandtrap :

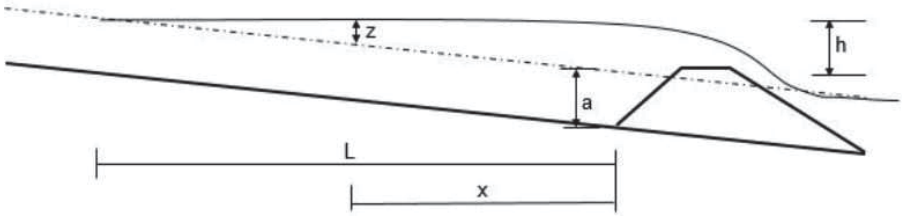
1. Type saluran : pasangan batu tegak
2. Lebar saluran (b) : 6,70 m
3. Tinggi muka air (h) : 1,20 m
4. Kemiringan (I) : 0,001317
5. Elevasi dasar pembilas hilir : 87,39
6. Elevasi MA pembilas hilir : 88,49
7. Elevasi dasar sungai : 85,67
7. Elevasi MA 40% Qtahunan : 86,70



Pengempangan :

Data-data teknis:

1. El. MA diatas mercu bendung = 97,19
2. Kemiringan sungai (I) = 0,01947
3. Tinggi bendung (a) = 2,60 m
4. Untuk mengetahui tinggi tanggul digunakan debit banjir rencana dengan periode ulang 1.000 tahun

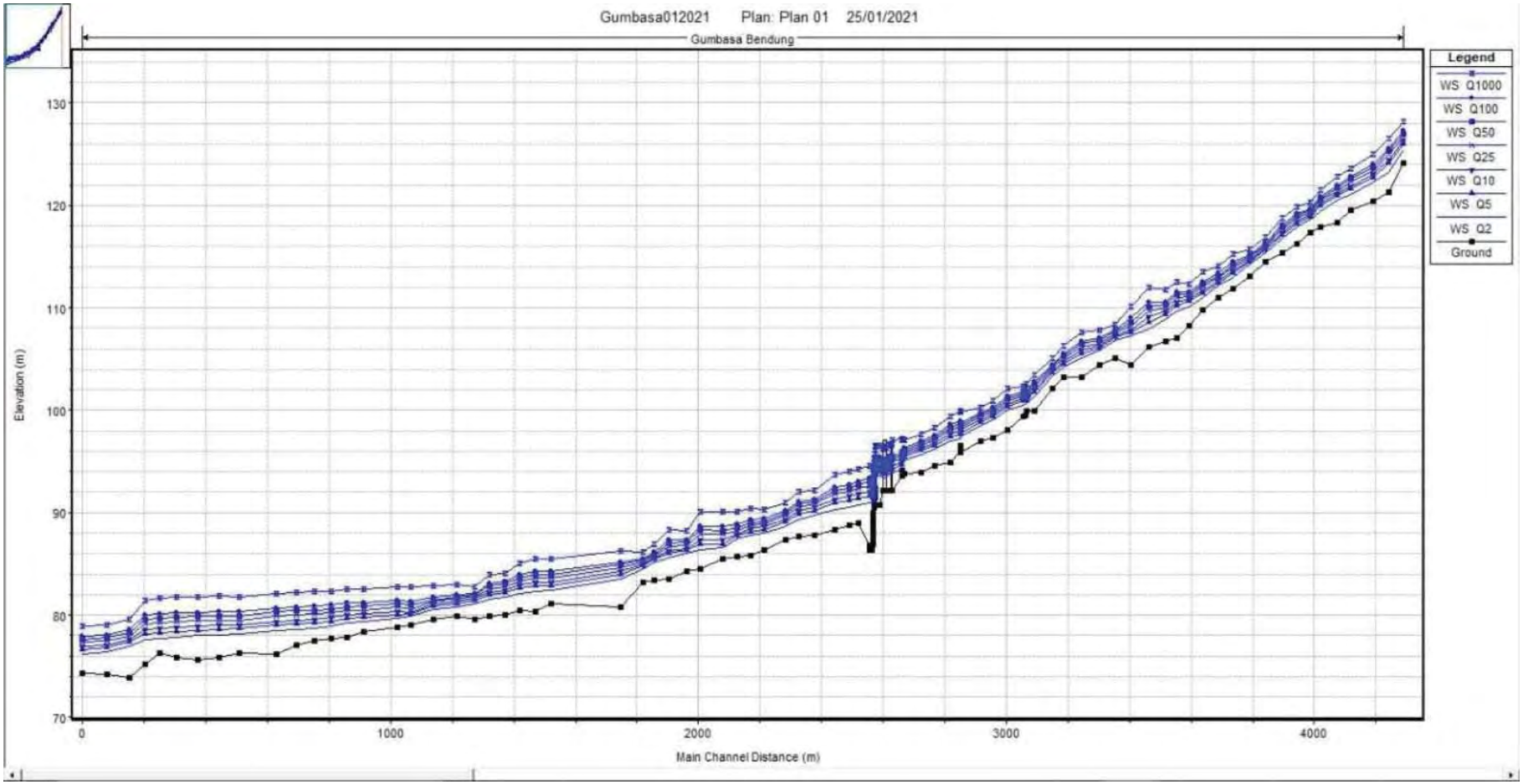


No./Point	Distance (x)	Z	Water Level	Embankment Elevation
Weir	0		97,19	97,19
1	37	4,11	97,22	97,22
2	62	3,67	97,27	97,27
3	87	3,25	97,34	97,34
4	112	2,87	97,44	97,44
5	137	2,50	97,56	97,56
6	162	2,16	97,71	97,71
7	187	1,85	97,88	97,88
8	212	1,56	98,08	98,08
9	237	1,29	98,30	98,30
10	262	1,05	98,55	98,55
11	287	0,84	98,82	98,82
12	312	0,65	99,11	99,11

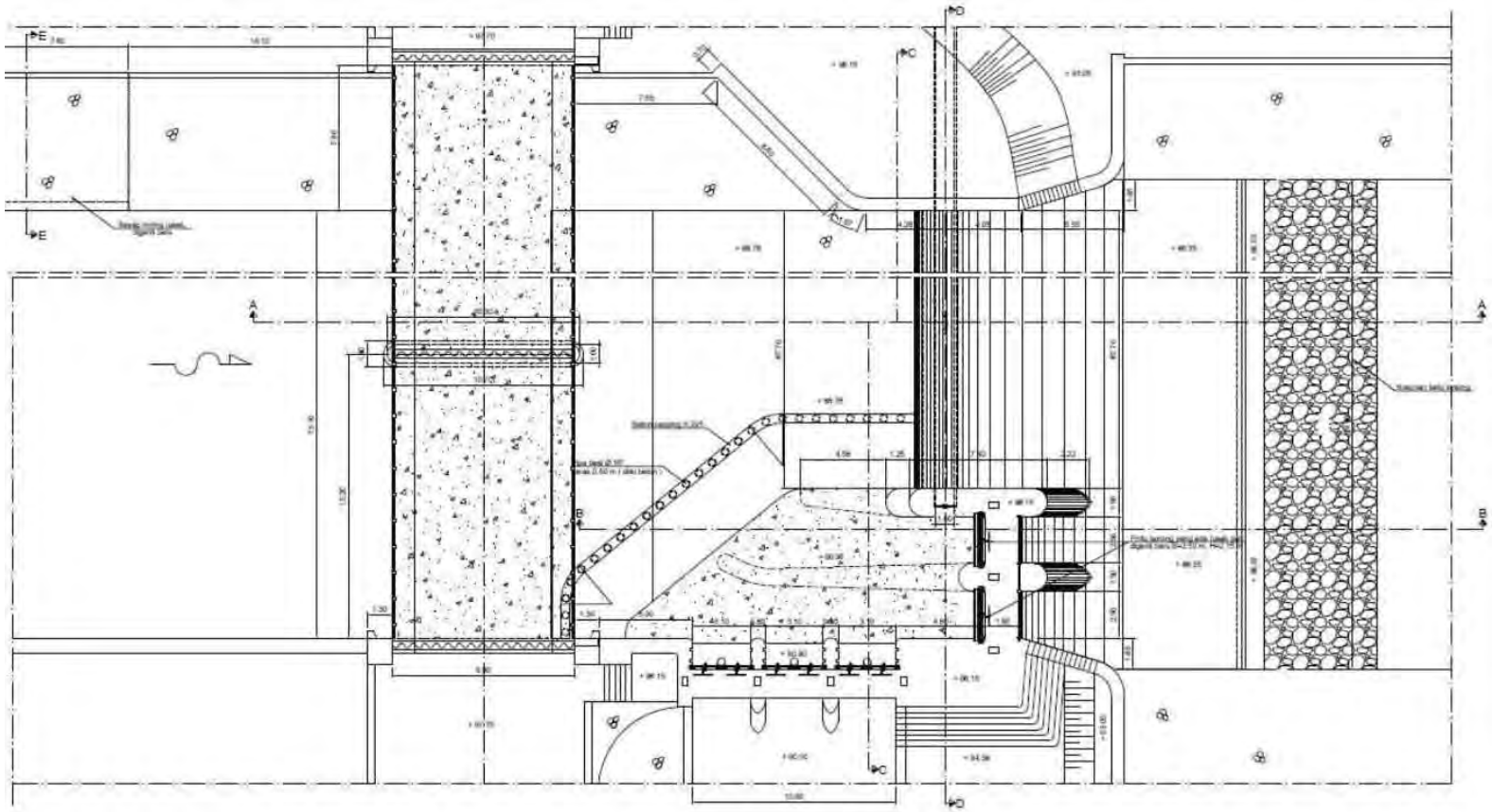
GUMBASA WEIR PROFILE PLOT

ON HEC-RAS USING Q2, Q5, Q10, Q25, Q50, Q100, Q1000

Return Year	Q	Weir	Endsill	Outlet	Water Level (m)			Depth (m)		
	(m3/sec)	(m)	(m)	(m)	Weir	Endsill	Outlet	Weir	Endsill	Outlet
Q2	162.7	92.4	86.55	85.67	93.17	90.94	87.43	0.77	4.39	1.76
Q5	283.4	92.4	86.55	85.67	93.52	91.65	87.78	1.12	5.1	2.11
Q10	379.1	92.4	86.55	85.67	93.76	92.1	87.89	1.36	5.55	2.22
Q25	516.6	92.4	86.55	85.67	94.07	92.65	88.2	1.67	6.1	2.53
Q50	630.5	92.4	86.55	85.67	94.31	93.04	88.5	1.91	6.49	2.83
Q100	752.3	92.4	86.55	85.67	94.55	93.4	88.82	2.15	6.85	3.15
Q1000	1214.1	92.4	86.55	85.67	95.35	94.6	90.06	2.95	8.05	4.39

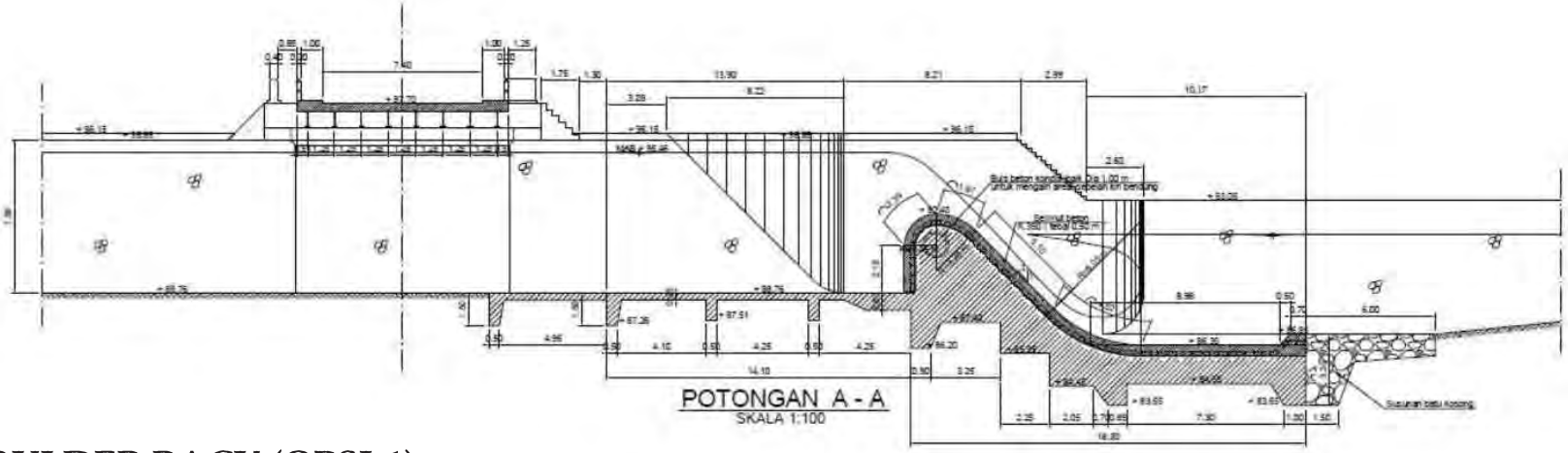

Gumbasa012021 Plan: Plan 01 25/01/2021
Gumbasa Bendung
Legend
WS Q1000
WS Q100
WS Q50
WS Q25
WS Q10
WS Q5
WS Q2
Ground
Elevation (m)
130
120
110
100
90
80
70
0
1000
2000
3000
4000
Main Channel Distance (m)

DENAH BENDUNG DENGAN BOULDER RACK OPSI-1

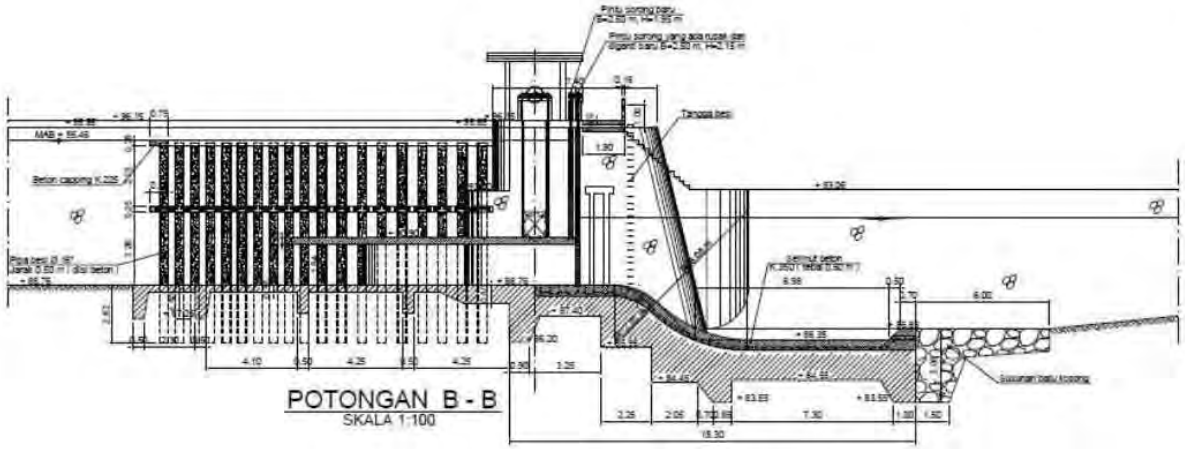


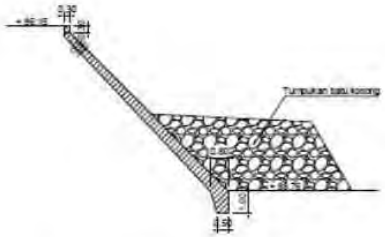
DENAH

POTONGAN MEMANJANG BENDUNG

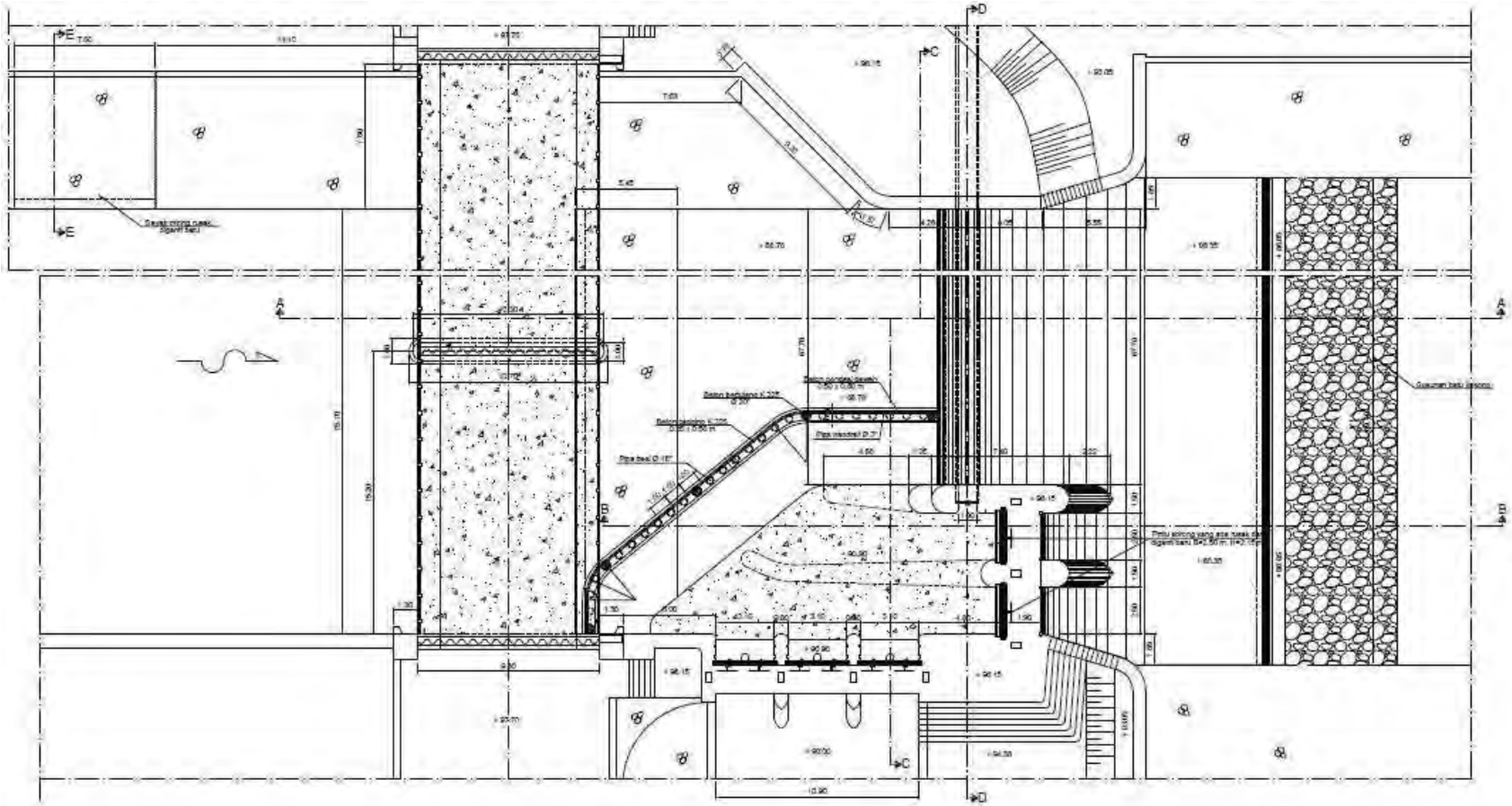


BOULDER RACK (OPSI-1)

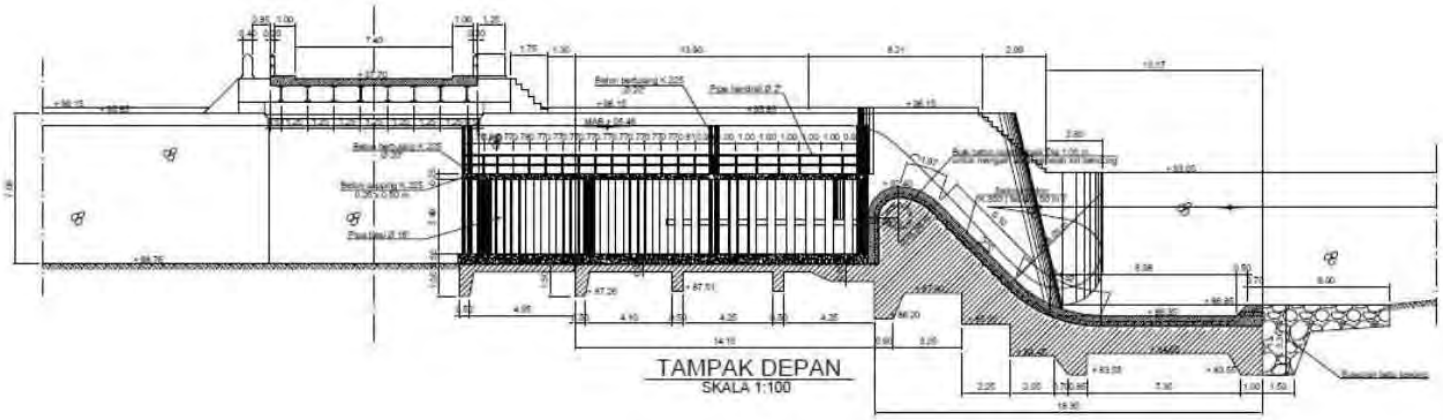


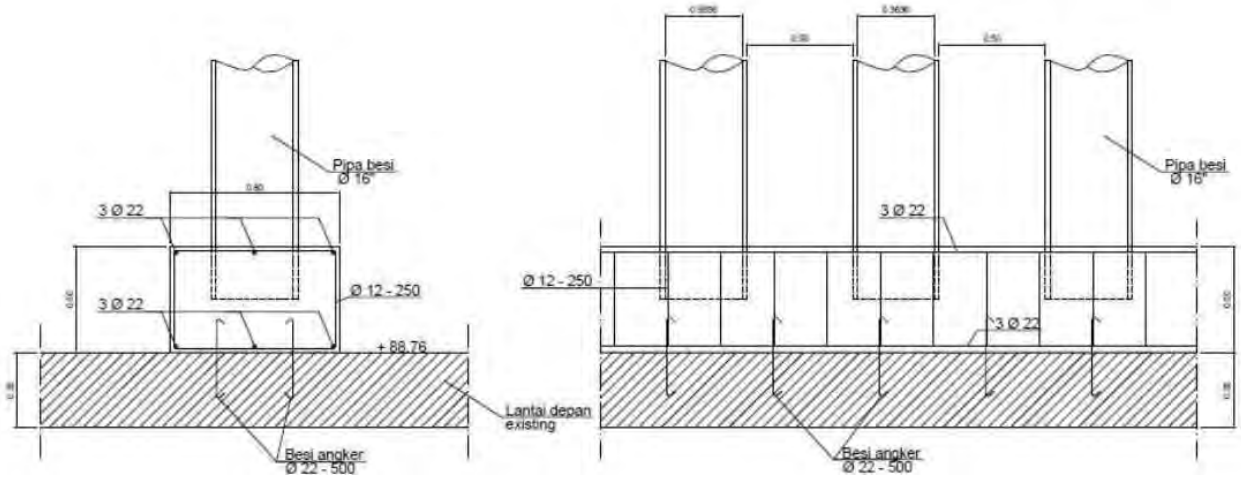


DENAH BENDUNG DENGAN BOULDER RACK OPSI-2

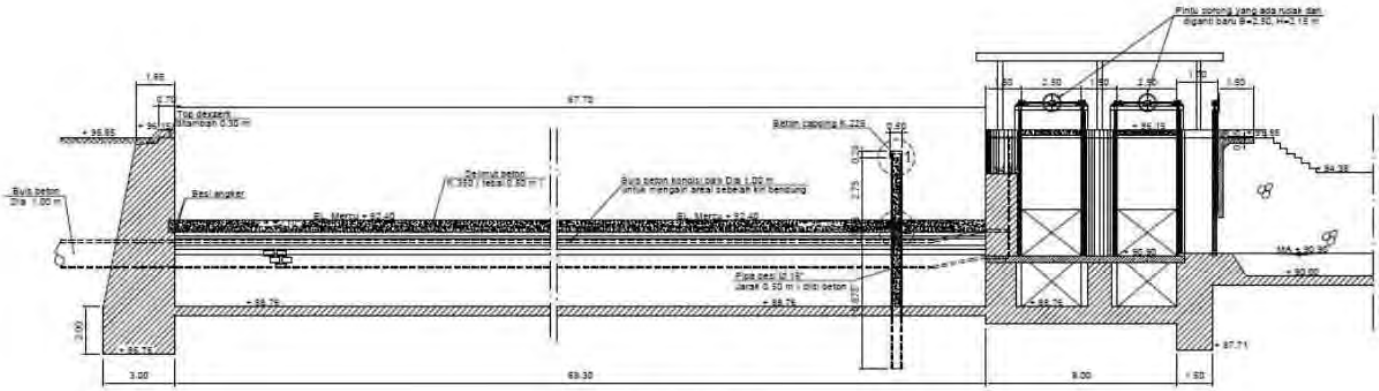


BOULDER RACK (OPSI-2)

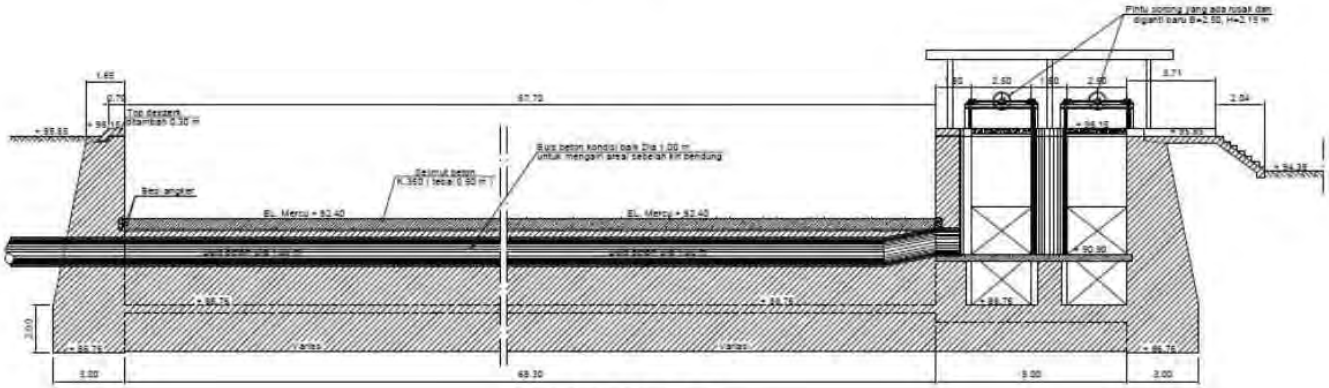




POTONGAN MELINTANG BENDUNG



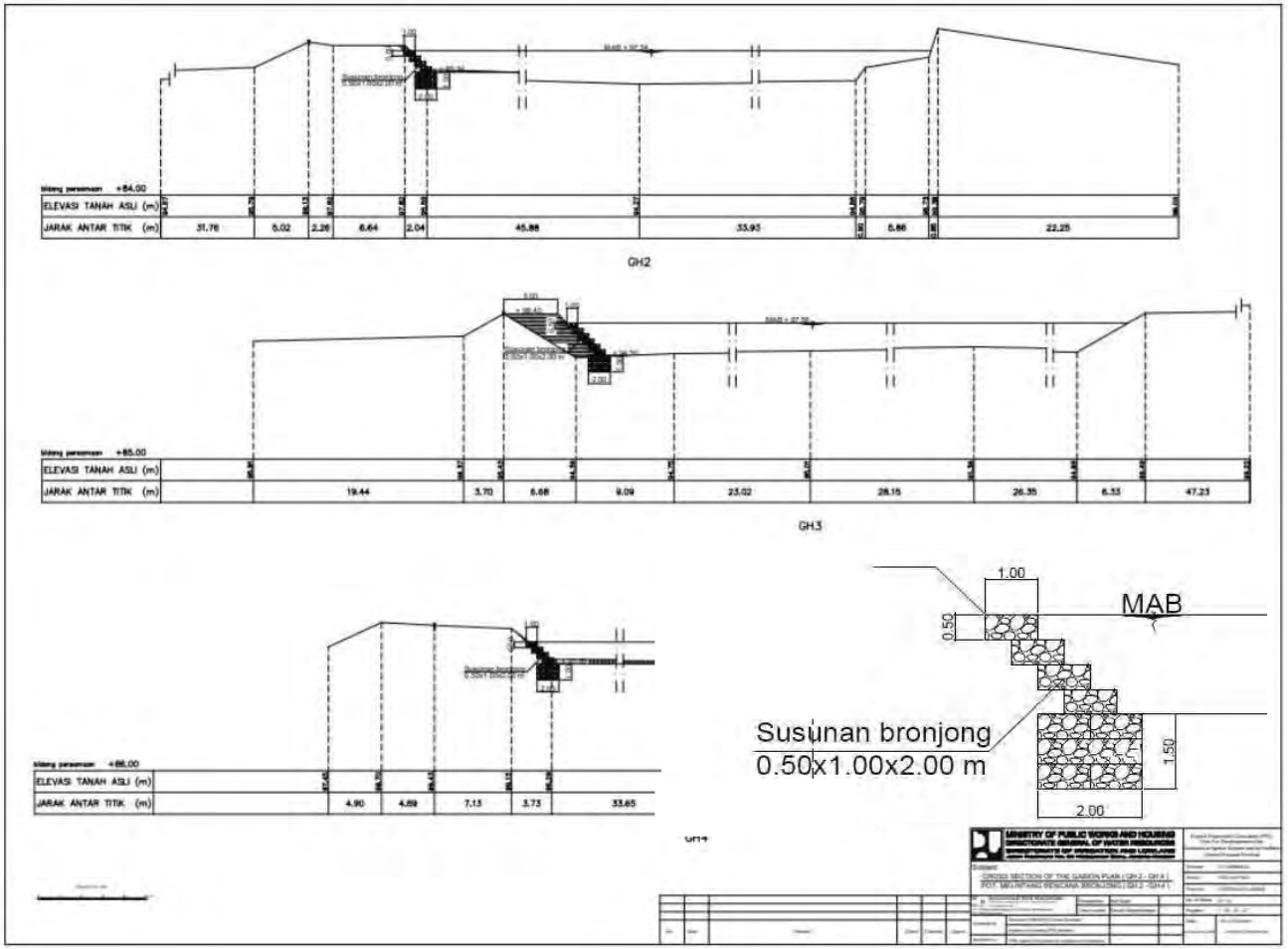
POTONGAN C - C
SKALA 1:100



POTONGAN D - D
SKALA 1:100

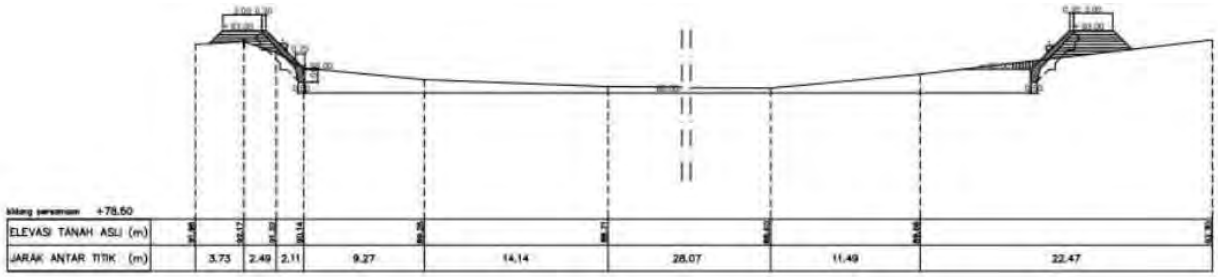
II-3-13-875

TANGGUL BANJIR KIRI

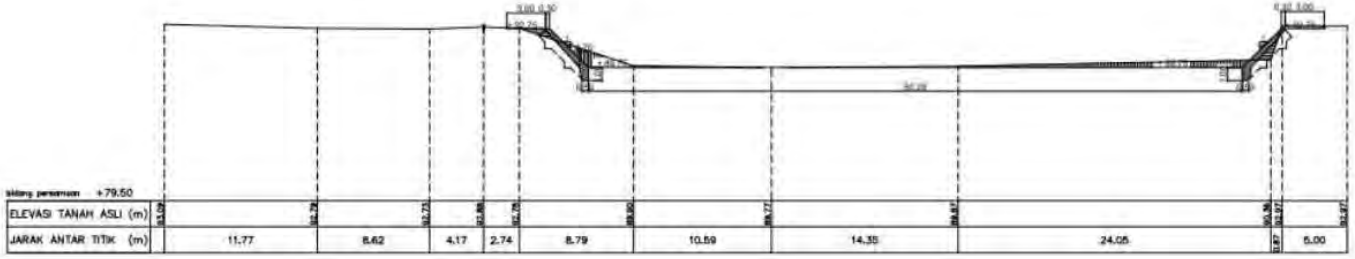


II-3-13-876

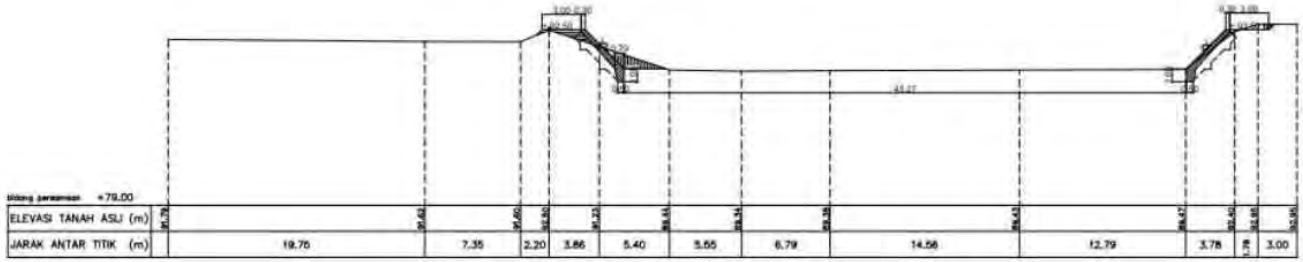
PROTEKSI SUNGAI HILIR BENDUNG



G1

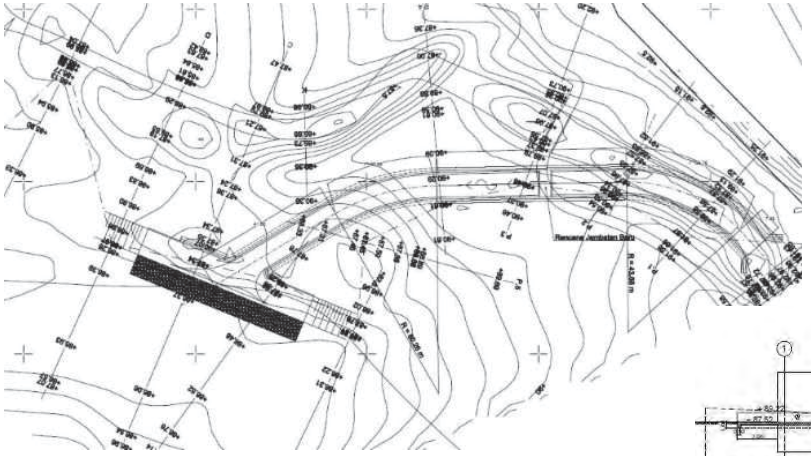


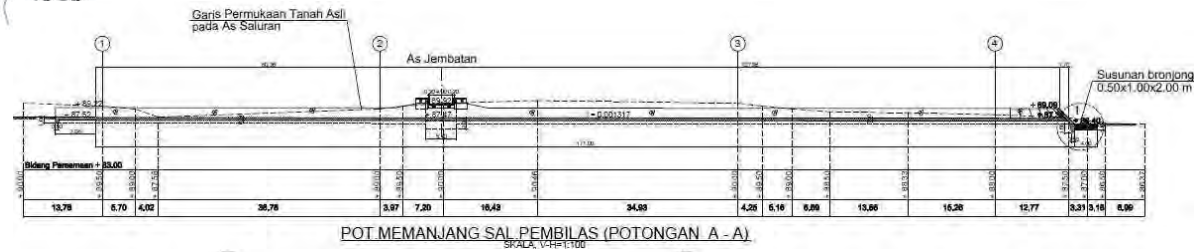
G2



G3

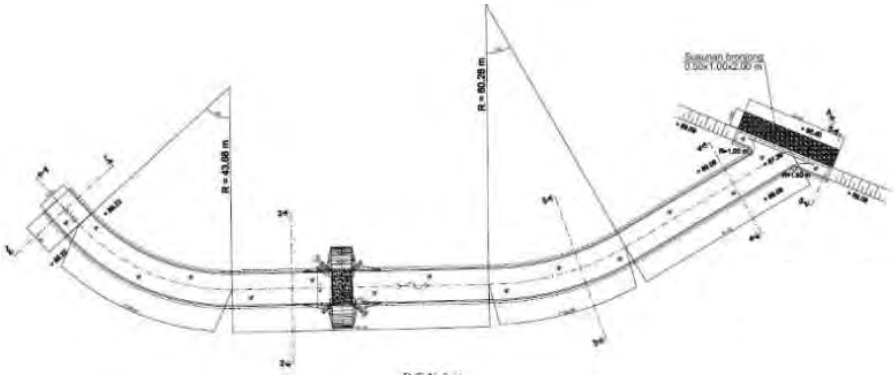
SALURAN PEMBILAS SANDTRAP

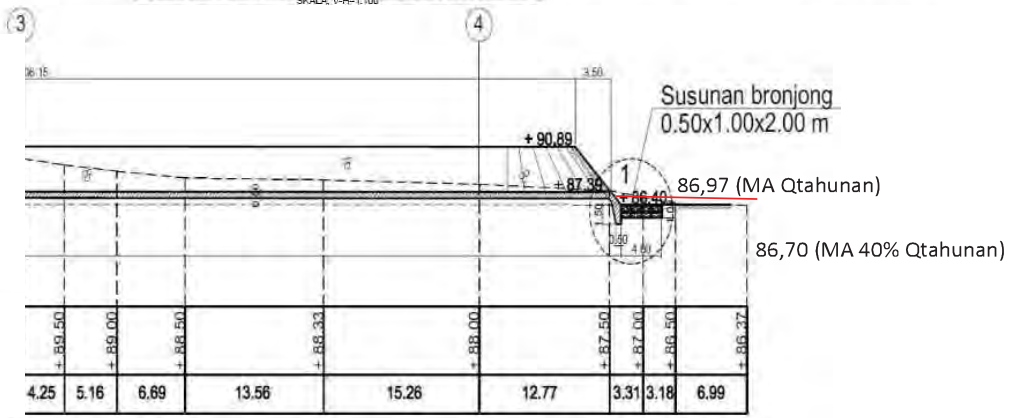




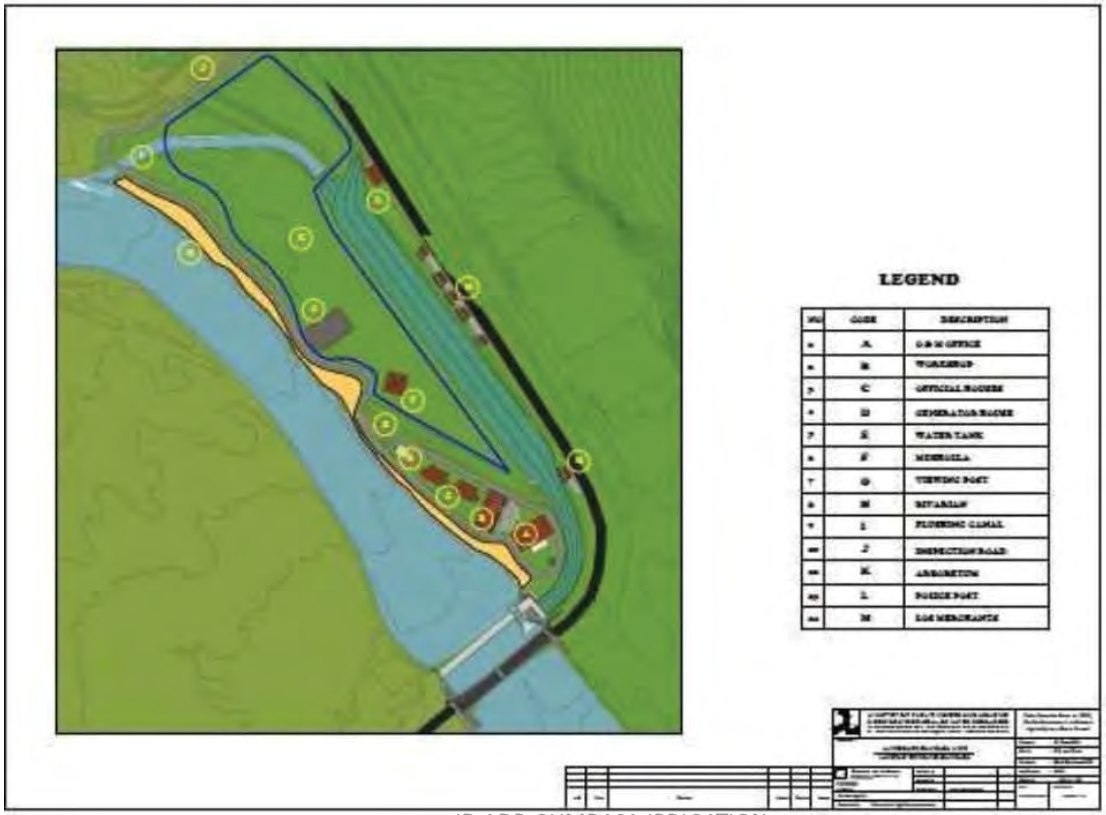
POT MEMANJANG SAL PEMBILAS (POTONGAN A - A)

SKALA, V-H=1:100

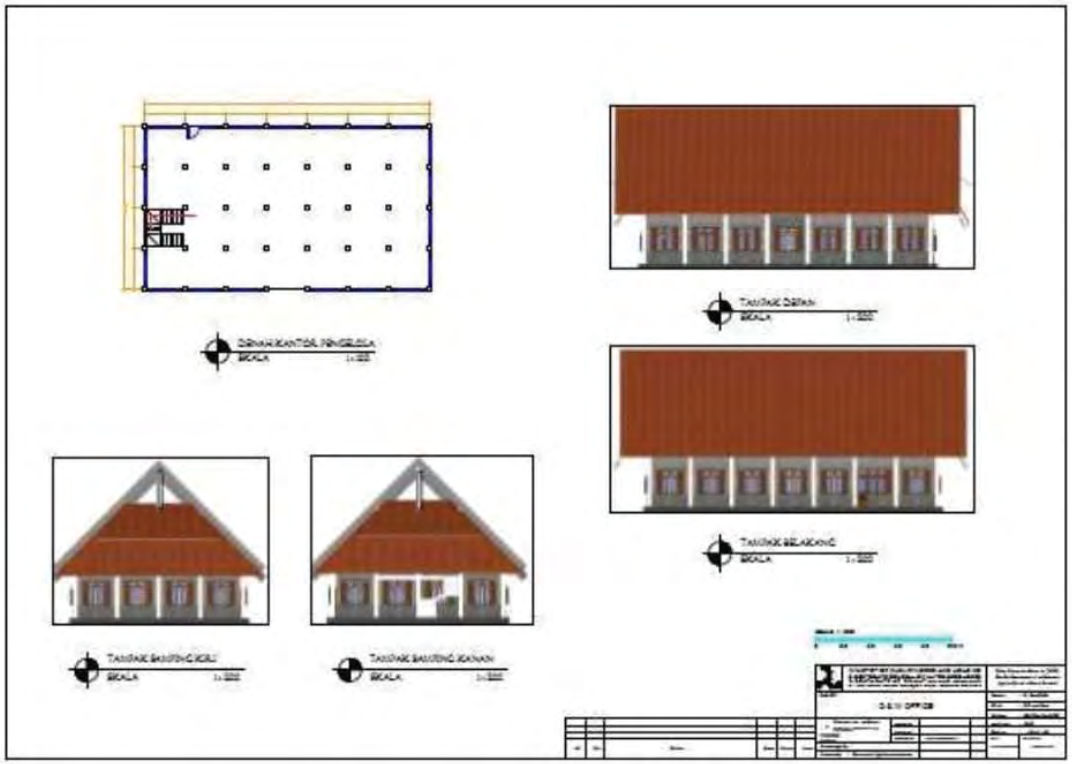




Landscape



Kantor Pengelola / O&P



Rumah Genset

Rumah Jaga / Rumah Dinas


SEKIAN DAN TERIMAKASIH

VOL.02

PROPOSALS TO GUMBASA RIVER SEDIMENT CONTROL DRAFT BASIC DESIGN

FOR

REHABILITATION *GUMBASA IRRIGATION SYSTEM*

Junichi FUKUSHIMA
Yachiyo Engineering Co.,Ltd Jakarta Office

January 27, 2021

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- Issues to be resolved
- Solution
- Basic conditions for the foundation design of this project
- Precautions for sediment control

POLICY

- Watershed characteristics
- Causes of sediment generation in mountainous areas
- Facilities to be protected from sediment runoff and damage in downstream areas

FACILTY PLANNING

- Proposal of Urgent Work for Downstream Area

FUTURE ISSUES

- The need for water resources development planning
- Sediment control proposals in areas of major sediment sources

OTHER COMMENT FOR D/D IRRIGATION SYSTEM

JICA-TATeam

APPROACH

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

Issues to be resolved

The earthquake that occurred on September 28, 2018 has led to a number of slope failures in the upper Gumbasa River basin, resulting in significant sediment runoff.
The water intake facility of the Gumbasa irrigation system has been damaged by the vibration of the earthquake. In addition, sediment flow and debris flows originating from the upper reaches of the Gumbasa River have caused further damage to facilities and sediment accumulation, resulting in reduced water intake functions.

The problem to be solved is to control the debris flow and sediment deposition in order to maintain the normal functioning of the water intake.

There are two major possible impacts of sediment in the Gumbasa River.

(1) Damage to water intake facilities due to direct impact of mudslides
(2) Degradation of water intake function due to sediment accumulation

- ***Provide sediment control at Gumbasa River for abnormal sediment runoff after the 2018 earthquake.***
- ***Gumbasa irrigation system will formulate sediment control measures for normal runoff. Sediment control measures include sediment inflow control works (hard measures) and maintenance measures (including soft measures).***

JCA-TATeam

Solution

It is necessary to prevent a direct hit of earth and stone flow to the facility or to take measures to reduce the force of direct hit of earth and stone, and the following two methods are available as countermeasures.

(1) Supplement the debris flow upstream of the water intake facility.
(2) Reduce the velocity of the debris flow to reduce the impact force.

Possible countermeasure facilities are as follows.
(1) Sediment supplementation and sediment volume control by erosion control dams
(2) Slowing down the riverbed gradient by sand pockets and bedding

This proposal proposes a combination of the above two methods.

The above solutions are to control sediment flows and debris flows that occur during large floods, and this methods cannot stop sediment runoff during normal times. In particular, it is estimated that sand and small gravels will be continuously mixed into and washed downstream by the flowing water. Therefore, control of chronically deposited sand and gravel at irrigation channel intakes must be combined with maintenance work.

JICA-TATEAM

Basic conditions for the foundation design of this project

① It is assumed that this is an emergency project.

② The project is limited to countermeasures against post-earthquake sediment runoff transformations. Countermeasures against sediment and sedimentation that were previously discharged are considered as normal, and are assumed to have been taken into account at the intake and irrigation facilities.

③ The sediment control plan for the entire watershed will not be considered. Therefore, the effects of the facilities are assumed, and will be verified when the master plan is formulated.

④ Select facilities that can be constructed quickly and are considered to be highly effective.

⑤ Since the effectiveness of the facilities is unknown, maintenance and management is always necessary.

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Precautions for sediment control

The aforementioned countermeasure facility is called a SABO facility, and the items outlined above need to be carried out before its construction.

① Survey of river channel and collapsed area
② Investigation of the nature of the debris flow
③ Rainfall data collection and geological survey
④ Survey and investigation
⑤ Flood analysis and sediment runoff analysis
⑥ Flood analysis and sediment runoff analysis 6) Flood control and sediment control plan (Master Plan)
⑦ Facility layout plan
⑧ Planning of facility construction schedule and selection of priority facilities for construction
⑨ Basic design of priority facilities
⑩ Outline design of priority facilities
⑪ Detailed design of priority facilities

At the beginning of this project, due to the lack of time and data to implement the above items, the procedure will be omitted and only ⑨ will be implemented at a lower design level. When the actual construction starts, the survey data and collected data will be updated and this basic design will have to be reviewed.

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POLICY

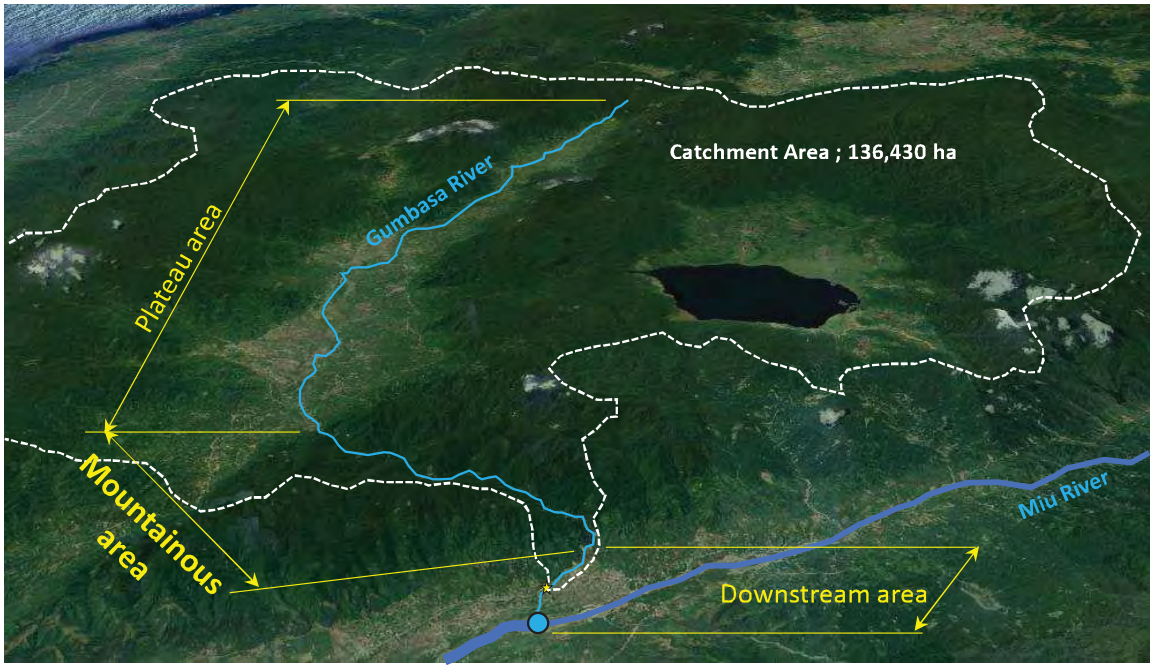
OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

Watershed characteristics

The Gumbasa River is 50 km long from the confluence of the Palu River and has a vast basin including the Lindu Lake. It is divided into highland and mountainous areas based on the characteristics of the river.
The Gumbasa River basin can be divided into three major areas based on the characteristics of the river: the highland area, the mountainous area, and the downstream area.
Of these, the areas that produce the most sediment are the mountainous areas and downstream areas.
The mountainous area has a steep riverbed gradient and is the section where mudslides occur and flow down.
On the other hand, the downstream area in (3) is the section where the debris flows and the deposited sediment is moved secondarily.



The Gumbasa River is broadly divided into
(1) Plateau area
(2) Mountainous area
(3) Downstream area.

The main section where sediment is generated after the earthquake 2018 is the **Mountainous area.**

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Causes of sediment generation in mountainous areas

The slope collapse on the south slope (right bank side) of the Gumbasa River is remarkable. It is presumed that this collapsed sediment accumulates on the riverbed, and the sediment flows down as a debris flow during a flood.

Reference ;
In the event of a 100-year return period, the total amount of sediment that flows out in a single flood is estimated to be 100,000 m^3 ～500,000 m^3 .
To estimate the amount of sediment runoff, it is necessary to study the geological conditions, rainfall conditions, and river channel conditions in the entire Gumbasa River basin.

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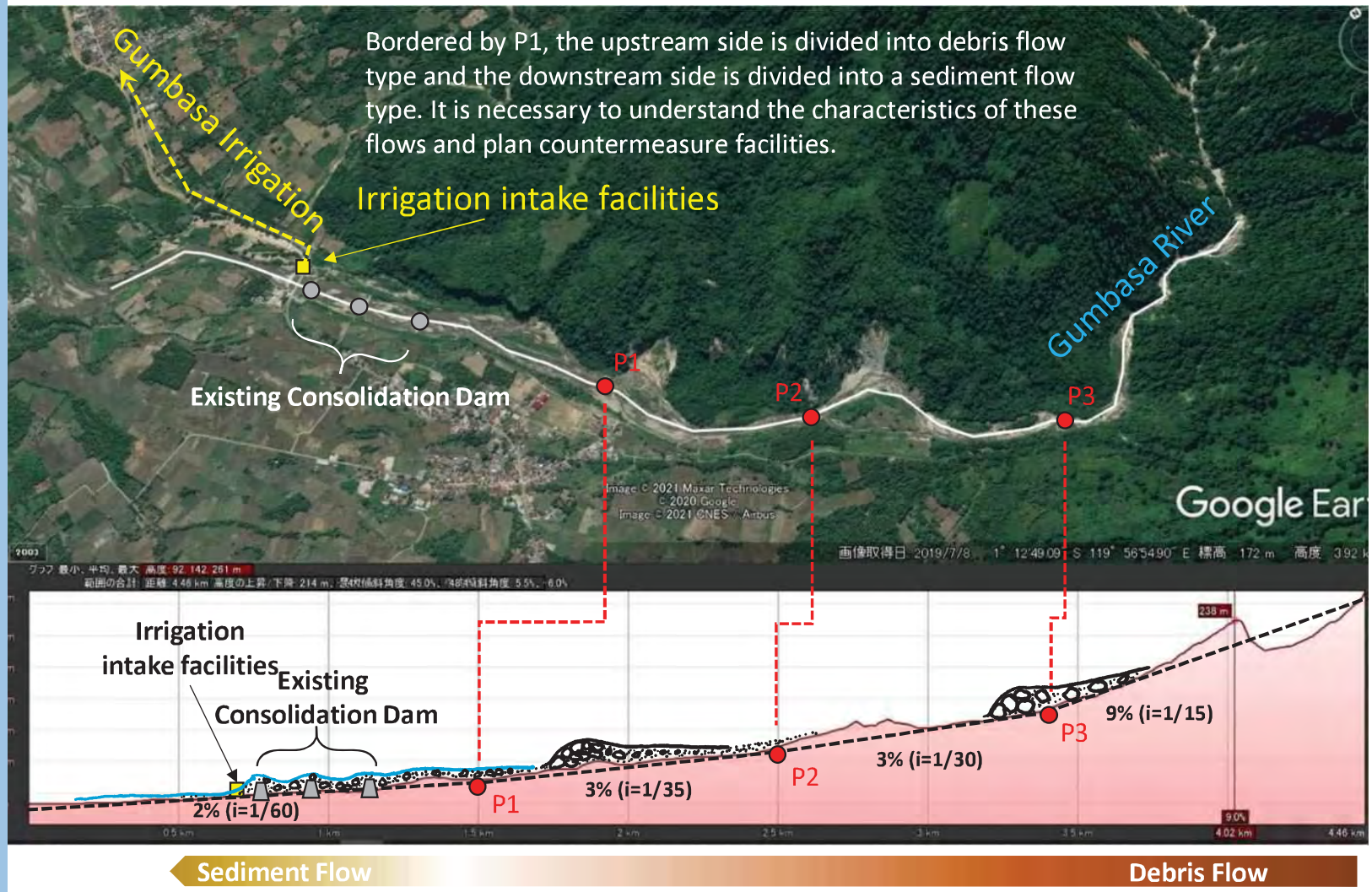
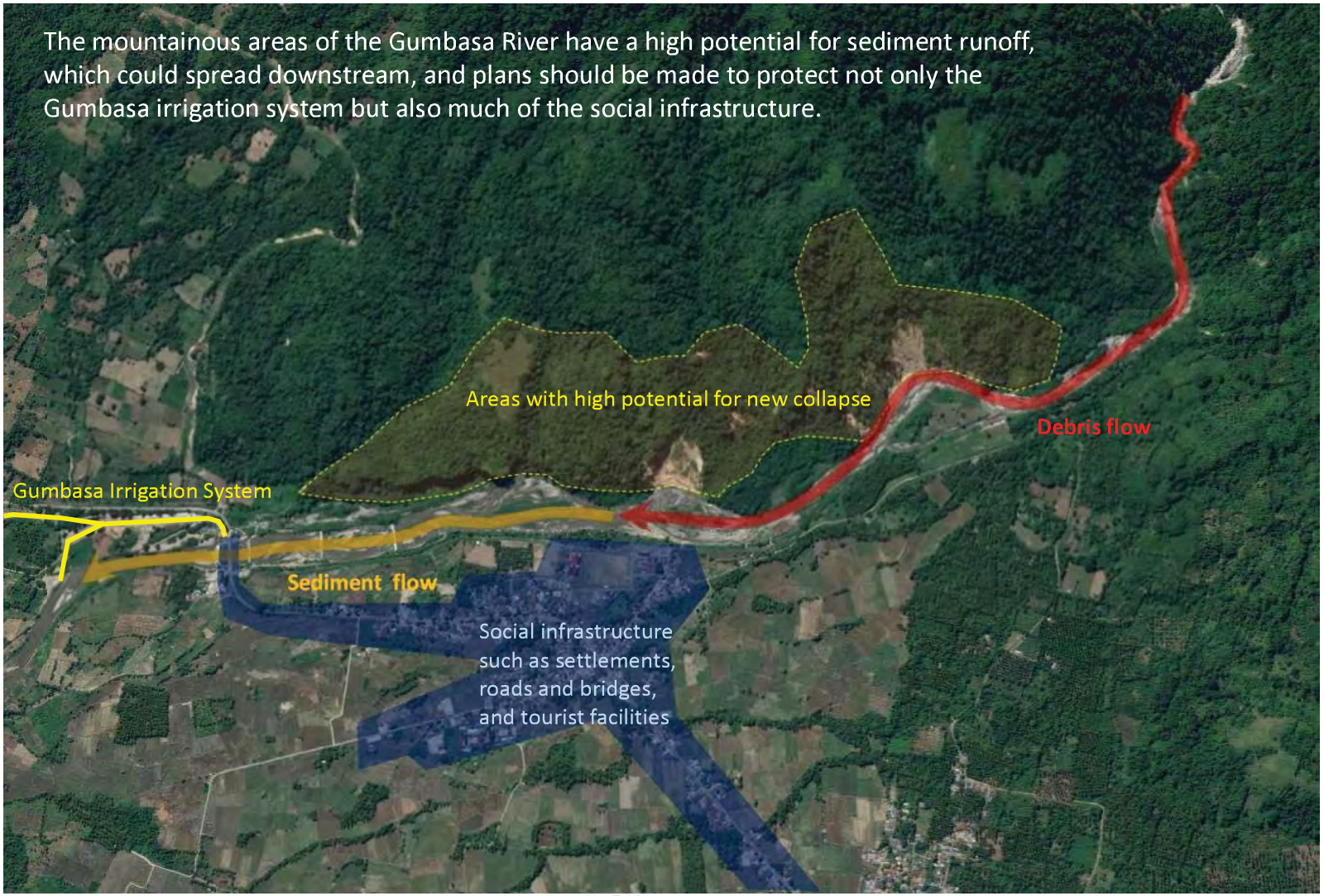
Estimating sediment runoff in the downstream area



Facilities to be protected from sediment runoff and damage in downstream areas



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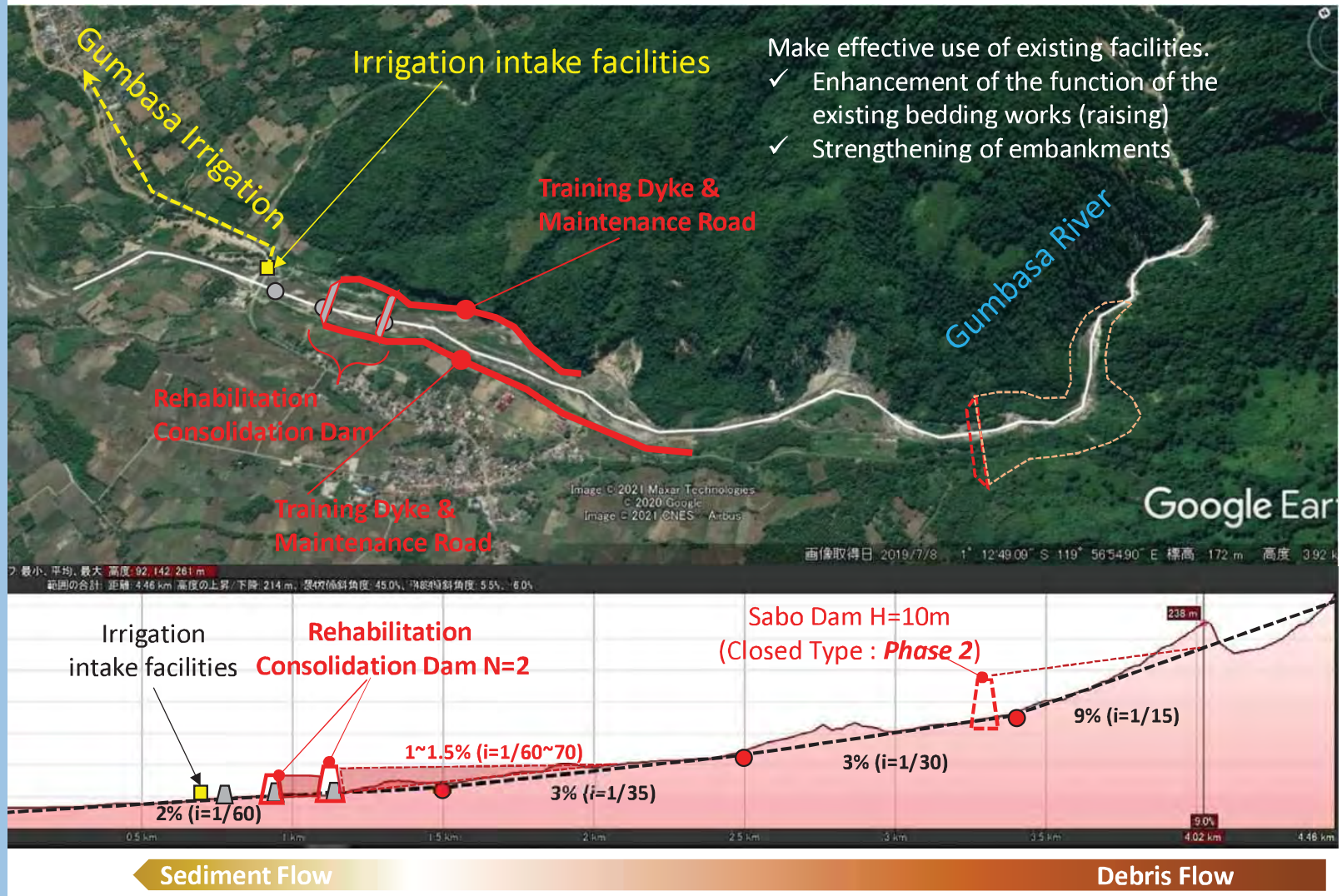
FACILITY PLANNING

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

Proposal of Urgent Work for Downstream Area (Plan A)



Make effective use of existing facilities.

- ✓ Enhancement of the function of the existing bedding works (raising)
- ✓ Strengthening of embankments

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Proposal of Urgent Work for Downstream Area (Plan A)

Urgent works are mainly proposed to utilize the existing social infrastructure and upgrade its functions.

Items	Quantity*	Spec*
Rehabilitation Consolidation Dam	2 set	H=7m (raising the height 2m) Apron works (riverbed protection)
Training Dyke & Maintenance Road	2.2 km	H=4m, W=3m, Embankment Structure + Stone Protection L= 2.2 km (right 0.9km + left 1.3km)
Ancillary Facilities	1 set	Access road for sediment removal Irrigation water collection equipment Sightseeing facilities

*The specifications must be reviewed during detailed design.


Existing Consolidation Dam2


Existing Consolidation Dam1


Existing Dyke

Photo provided by Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province

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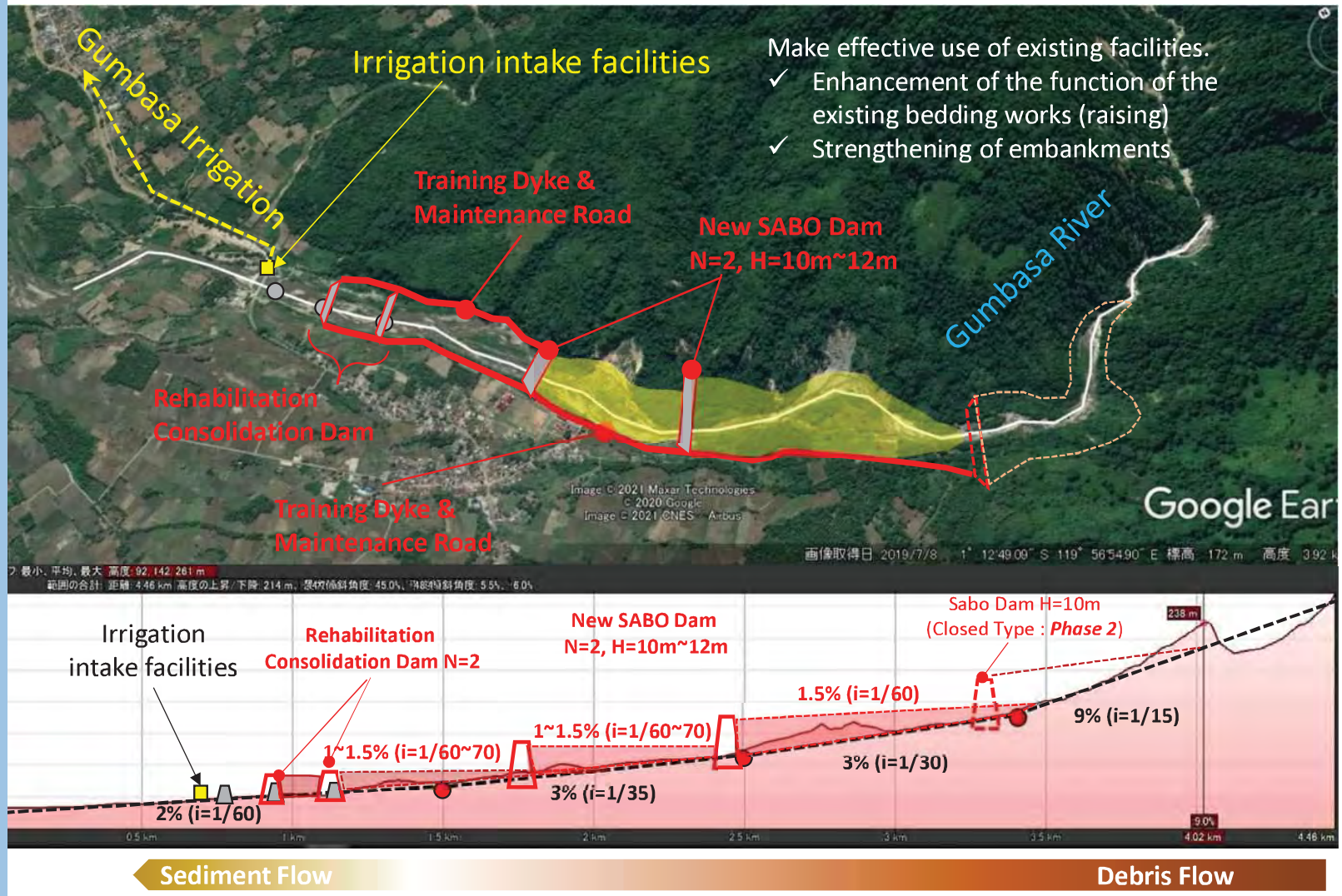
Proposal of Urgent Work for Downstream Area (Plan B)



Make effective use of existing facilities.

- ✓ Enhancement of the function of the existing bedding works (raising)
- ✓ Strengthening of embankments

Sediment Flow ⟷ **Debris Flow**

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Proposal of Urgent Work for Downstream Area (Plan B)

Urgent works are mainly proposed to utilize the existing social infrastructure and upgrade its functions.

Items	Quantity*	Spec*
Rehabilitation Consolidation Dam	2 set	H=7m (raising the height 2m) Apron works (riverbed protection)
New Sabo Dam	2 set	H=10~12m
Training Dyke & Maintenance Road	3.2 km	H=4m, W=3m, Embankment Structure + Stone Protection L= 3.2 km (right 0.9km + left 2.3km)
Ancillary Facilities	1 set	Access road for sediment removal Irrigation water collection equipment Sightseeing facilities

*The specifications must be reviewed during detailed design.


Existing Consolidation Dam2


Existing Consolidation Dam1


Existing Dyke

Photo provided by Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province

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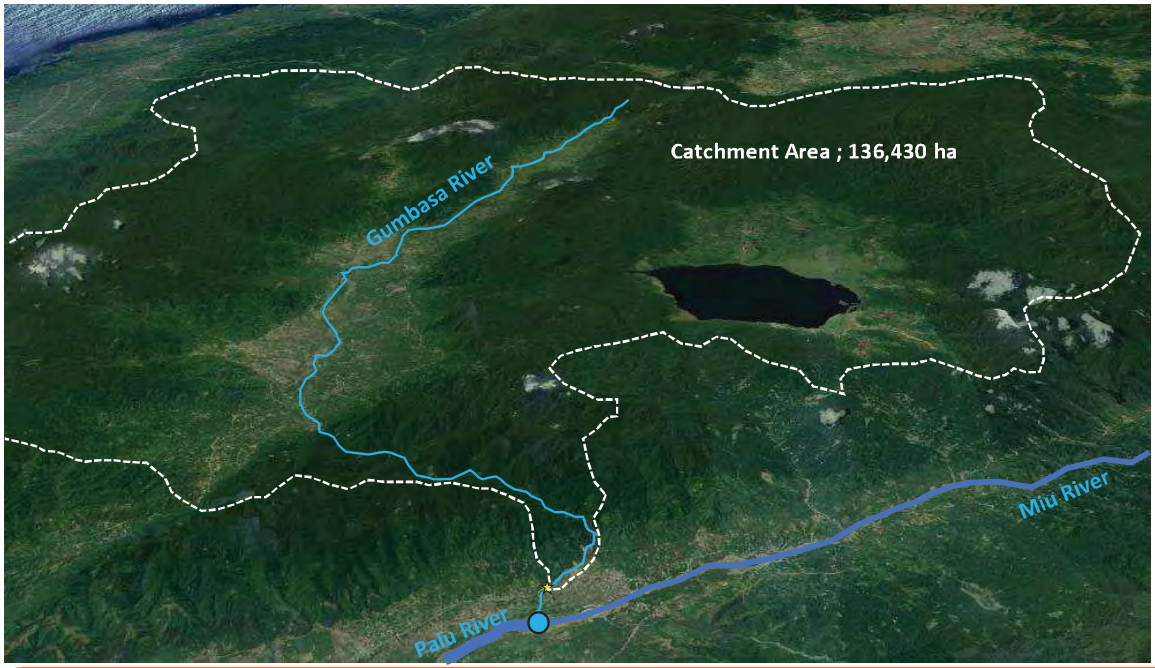
FUTURE ISSUES

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

The need for water resources development planning



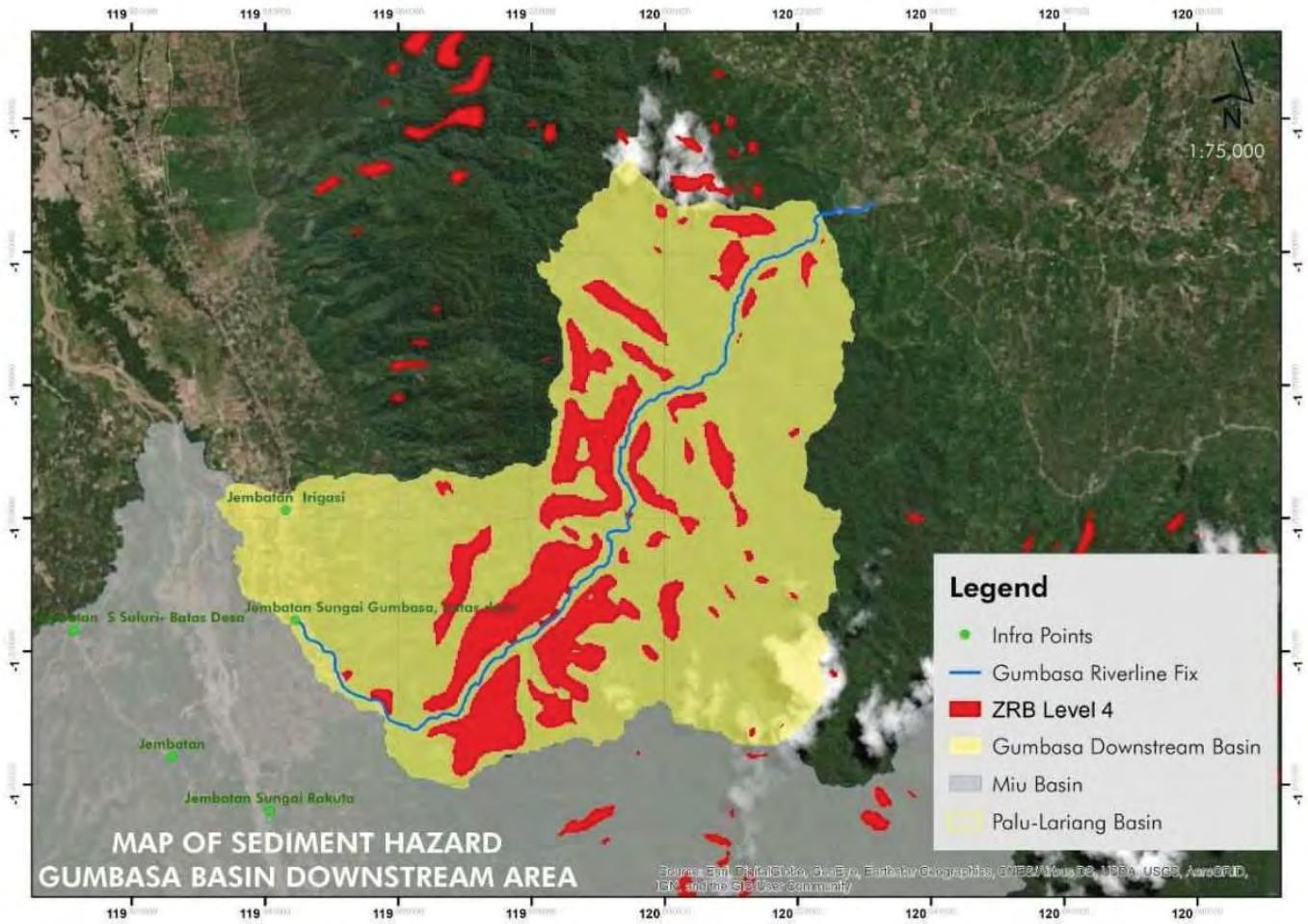
As for water resource development, it is necessary to develop a plan for water use, based on flood control.

Tabel 1: Kebutuhan Air Pada DAS Miu dan Gumbasa Tahun 2009 dan 2030

NAMA DAS	LUAS DAS (Ha)		Q Ketersediaan (Juta m3/th)	Q Kebutuhan Air (Juta m3/th)				Total Q Kebutuhan
				Irigasi	Peternakan	Perikanan	RT, Kota & Penggelontoran	
DAS Miu	69,503.25	Tahun 2009	538.12	66.88	0.23	0.12	3.41	70.63
		Tahun 2030	156.24	1.95	0.27	6.46	164.92	375.20
DAS Gumbasa	136,427.50	Tahun 2009	684.79	267.36	0.54	0.31	13.95	282.16
		Tahun 2030	427.66	4.02	0.60	26.67	458.95	225.83

STUDI POTENSI SUMBER DAYA AIR DALAM MENUNJANG POLA PENGGELOLAAN SUMBER DAYA AIR
(Studi Kasus DAS Miu dan Gumbasa)
Dian Noorvy[1], Kiki Frida Sulistyani[2]
Dosen Jurusan Teknik Sipil, Universitas Tribuana Tungga Dewi, Malang
Alumni S2 Teknik Sipil Universitas Brawijaya, Malang

Sediment control proposals in areas of major sediment sources



The JICA-TC project has shown vulnerable areas (high potential for slope failure) in mountainous areas. If this district were to experience a slope failure, a very large amount of sediment would be generated, which could cause significant damage downstream.

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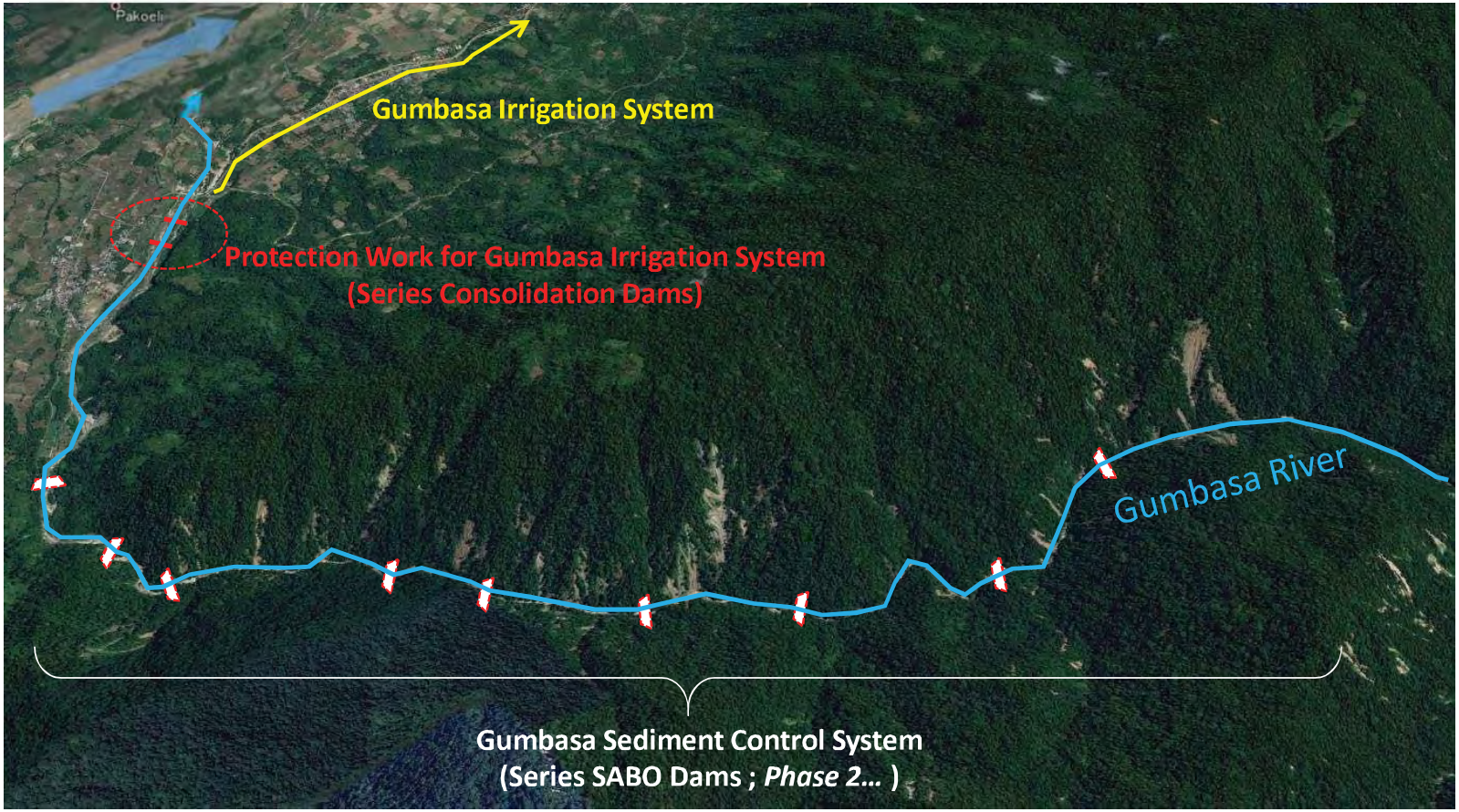
Sediment control proposals in areas of major sediment sources



In line with the Master Plan, a SABO Master Plan for mountainous areas needs to be developed. The figure above is an example.

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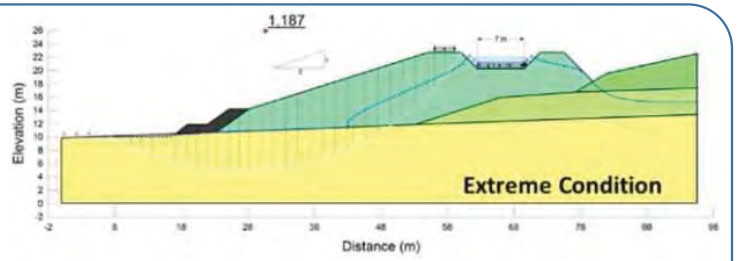
OTHER COMMENT

FOR D/D IRRIGATION SYSTEM

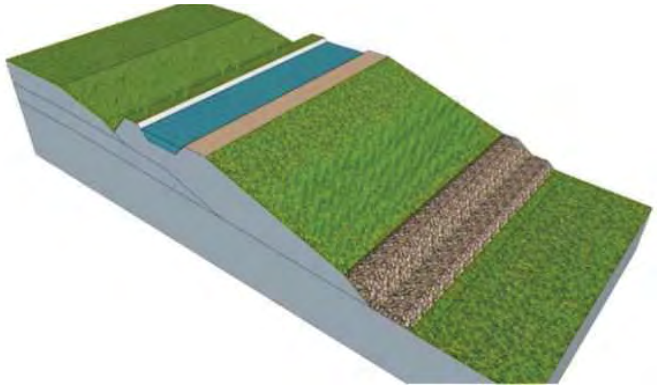
FOR

GUMBASA RIVER SEDIMENT CONTROL

Target Discharge of Gumbasa river



No.	Slope Angle Variation	Global FS	Note
1.	Static condition	2,220	> 1,5
2.	Static + water level	2,074	> 1,5
3.	Seismic condition	1,377	> 1,1
4.	Extreme seismic + water level	1,187	> 1,1
	FS mininimum for seismic	1,1	



Source ; "Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province" Presentation material as on January 21,2021

Comments

- It is evaluated as the most stable structure as a standard cross section of irrigation channel.
- Even if an unexpected earthquake or liquefaction occurs, the structure is tenacious against deformation and easy to repair.
- The geological structures of the Sibalaya and Jono Oge districts are different and require thorough geological surveys and modeling.
- It is necessary to reconfirm the scenario conditions when planning a scenario (calculation case) for stable examination. (assumed phenomenon)
- The embankment stability study (arc slip calculation) targets the foundation ground of the embankment, but isn't it necessary to study the stability of a larger area including the liquefaction area?
- For the embankment, it is necessary to use a material that is resistant to earthquakes and liquefaction.
- It is necessary to add drainage in the embankment, groundwater that may rise from the foundation ground, and drainage function that reduces groundwater pressure.

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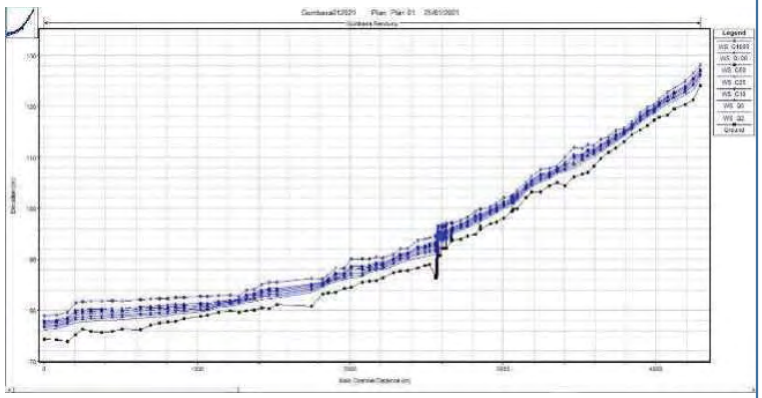
Target Discharge of Gumbasa river

GUMBASA WEIR PROFILE PLOT

ON HEC-RAS USING Q2, Q5, Q10, Q25, Q50, Q100, Q1000

Return Year	Q	Weir	Endsill	Outlet	Water Level (m)			Depth (m)		
	(m3/sec)	(m)	(m)	(m)	Weir	Endsill	Outlet	Weir	Endsill	Outlet
Q2	162.7	92.4	86.55	85.67	93.17	90.94	87.43	0.77	4.39	1.76
Q5	283.4	92.4	86.55	85.67	93.52	91.65	87.78	1.12	5.1	2.11
Q10	379.1	92.4	86.55	85.67	93.76	92.1	87.89	1.36	5.55	2.22
Q25	516.6	92.4	86.55	85.67	94.07	92.65	88.2	1.67	6.1	2.53
Q50	630.5	92.4	86.55	85.67	94.31	93.04	88.5	1.91	6.49	2.83
Q100	752.3	92.4	86.55	85.67	94.55	93.4	88.82	2.15	6.85	3.15
Q1000	1214.1	92.4	86.55	85.67	95.35	94.6	90.06	2.95	8.05	4.39



Source ; "Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province" Presentation material as on January 27,2021

Comments

- Since it is necessary to match with the future Sediment Control Plan, I would like to confirm the basis for determining the flow rate.
- The normal river maintenance target uses a return period of 25 years. What is the year of establishment of the planned water intake of this irrigation facility?
- When formulating a plan to protect the intake facility from earth and stone, the target flow rate should be consistent with the sediment control plan. Generally, when planning sediment control, the return period is 100 years.
- When a large amount of earth and sand is mixed, the flow rate should be expected to increase by about 10% to 20%.

Recommendation

How about setting up a sediment control facility on the upstream side of the water intake facility to reduce the impact of debris flow and sediment flow on the water intake facility?

*However, it should be noted that sediment and gravel transported at normal flow rates cannot be captured by the sediment control facility on the upstream side.

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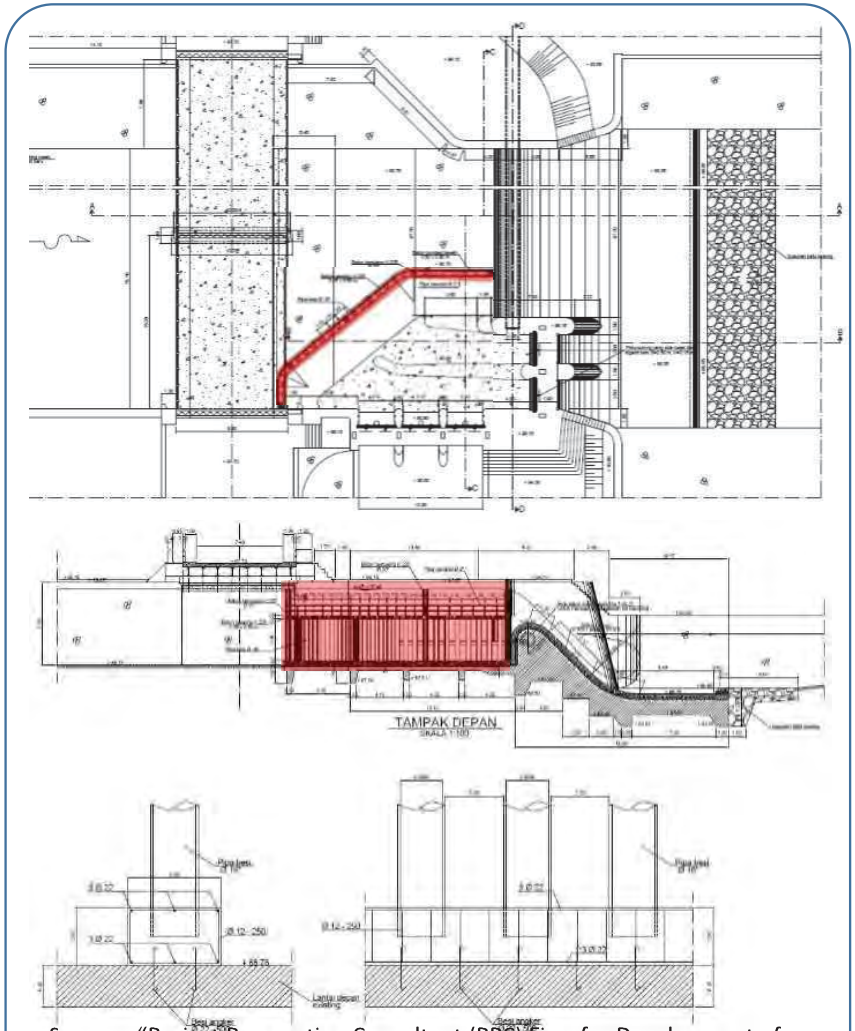
Bolder Rack Structure



Source ; "Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province" Presentation material as on January 27,2021

Comments

- Boulder rack can be evaluated as a very effective measure to protect the intake.
- In addition to earth and stone, many driftwoods flow down the Gumbasa River. For this reason, there is a high possibility that damage will be promoted if driftwood gets caught in the facility. This proposed structure can trap driftwood.

Matters of concern

① Is the facility strength sufficient when a debris flow collides? (Pile body, pile foundation)

② If the distance to the bridge on the upstream side is short and you trap earth and stone or driftwood, is the effect on the bridge considered?

Recommendation

A facility to capture earth and stone and driftwood will be installed on the upstream side of the bridge.
A sediment control facility on the upstream side will be planned, and megaliths and trees will be captured at the sediment control facility. (Matters to be discussed with BWS-SIII) The proposed facility plan does not need to be changed.

Liquefaction and groundwater fluctuations in the design of irrigation canals.

On January 27, 2021, an ADB consultant asked how to consider liquefaction and groundwater fluctuations in the design.

The IRSL project is not proceeding with the normal design procedure because the irrigation canal restoration work is progressing.
Currently, the basic design of the irrigation canal facility has been completed, so the following procedures and ideas must be followed.

- Liquefaction countermeasures and groundwater control should be planned assuming the condition after the irrigation canal is restored.
- The amount and area of water supplied by irrigation canals is important for liquefaction control and groundwater control. In the ADB project, it is necessary to finalize this water allocation plan (master plan).
- Geological structure with possibility of liquefaction should be verified in the condition after the irrigation canal is completed.
- In examining the possibility of liquefaction, it is important to reflect the results analyzed by JICA-TC.
- Groundwater control determines a target value (how many meters underground should be maintained) so that it does not worsen than the groundwater condition assumed when the possibility of liquefaction was examined. Plan countermeasure facilities to reach this target value

The major points are as above.
The detailed analysis conditions and the use of JICA-TC's analysis results will be discussed between the ADB consultant and the JICA team (JICA-TA).

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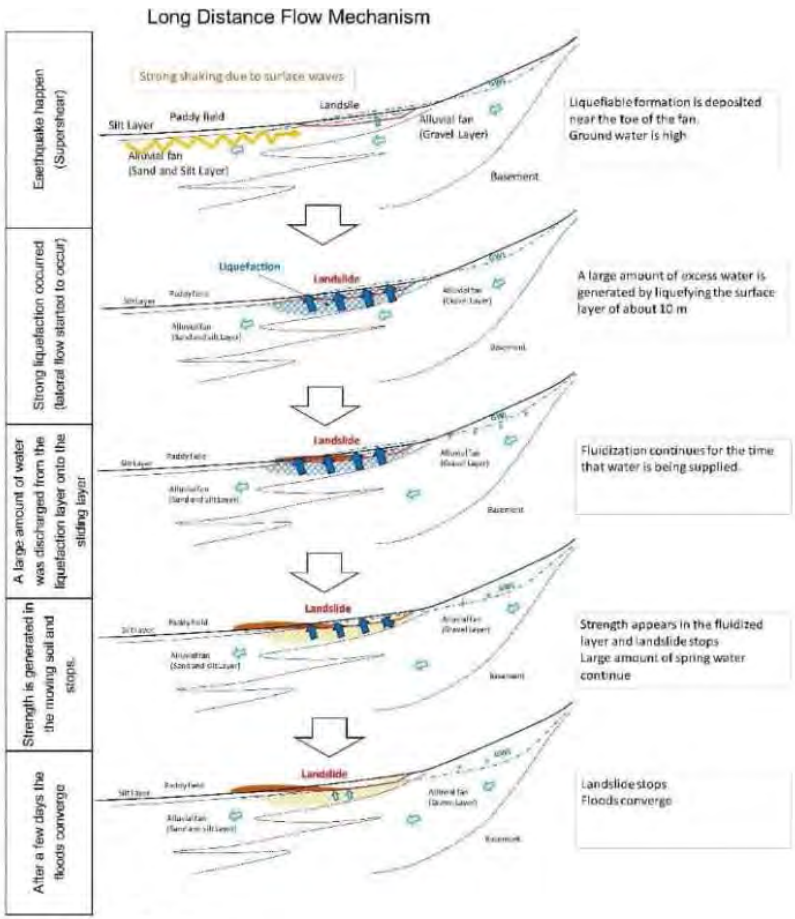
NALODO & GROUND WATER

FOR D/D IRRIGATION SYSTEM

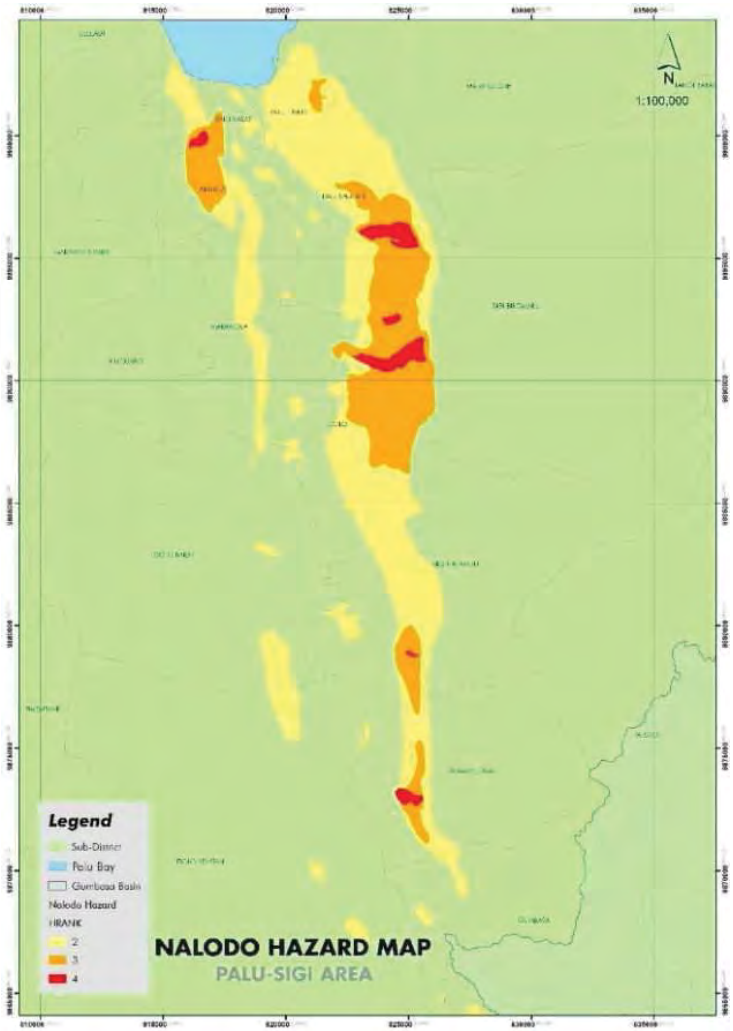
FOR

GUMBASA RIVER SEDIMENT CONTROL

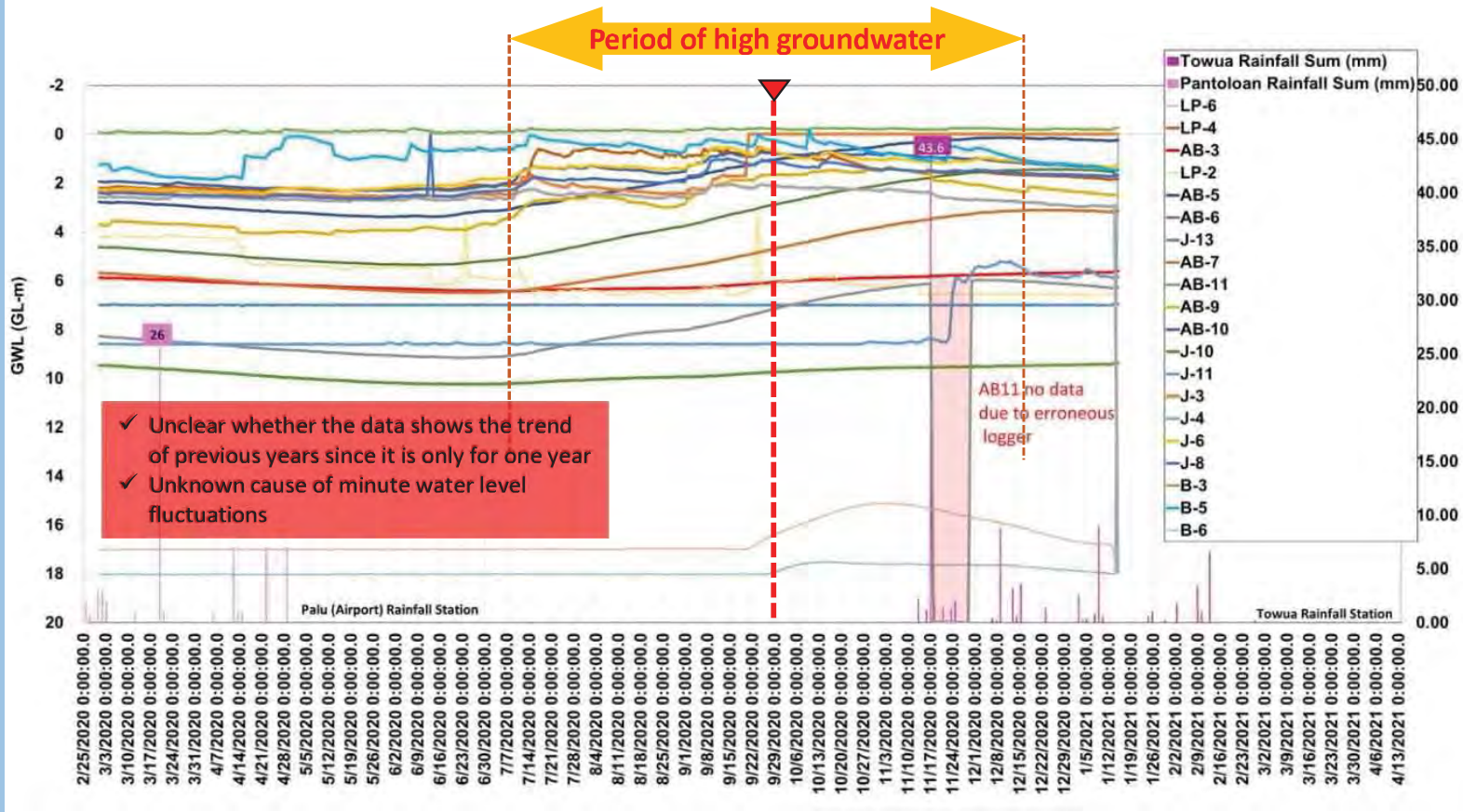
Liquefaction and groundwater fluctuations in the design of irrigation canals.



Source: Prepared by JICA Experts



Correlation between groundwater level and rainfall *(Analysis has not been completed!!)*



- ✓ Unclear whether the data shows the trend of previous years since it is only for one year
- ✓ Unknown cause of minute water level fluctuations

If the fluctuations in groundwater are the same every year, the earthquake that occurred on September 28, 2018 coincides with the time when the groundwater is highest.

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Liquefaction and groundwater fluctuations in the design of irrigation canals.

The Nalod (liquefaction landslide) phenomenon should be well understood and the geological composition and groundwater level should be modeled.

- The validity of the arc-slip model needs to be verified.
  - Load due to embankment
  - Possibility of water leakage from open channels
  - Setting of groundwater level
  - Consideration of groundwater pressure
  - Extent of liquefaction and strength of ground

The Nalod phenomenon has not been fully understood, and there are many unknowns.

In the design of the Gumbasa irrigation channel, it is assumed that the Nalod phenomenon will be controlled by liquefaction countermeasures (reduction of groundwater level and groundwater pressure), which will be implemented separately.
However, this assumption should be discussed by many professional engineers and cannot be judged at the individual level.

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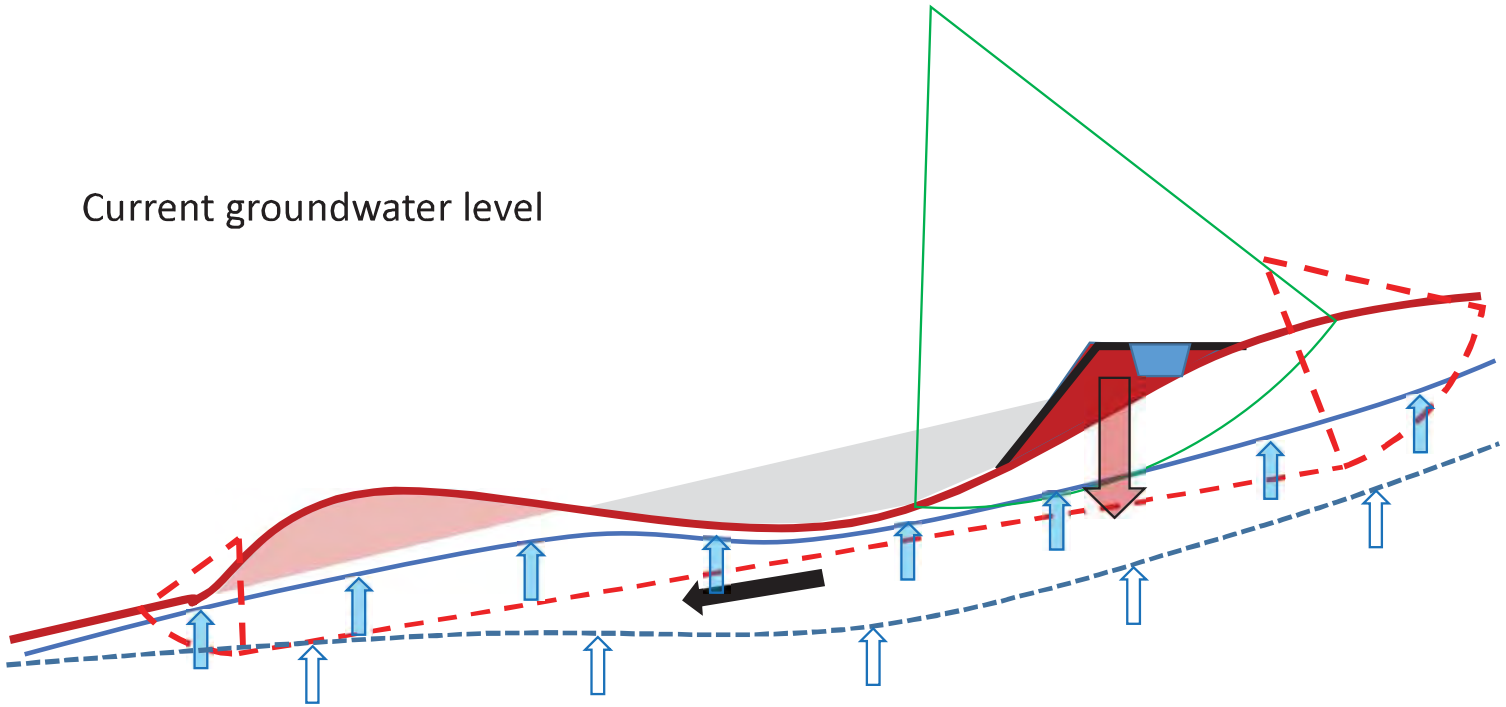

The validity of the arc-slip model needs to be verified.

JCA-TATEAM

Terima Kasih
ありがとうございます。

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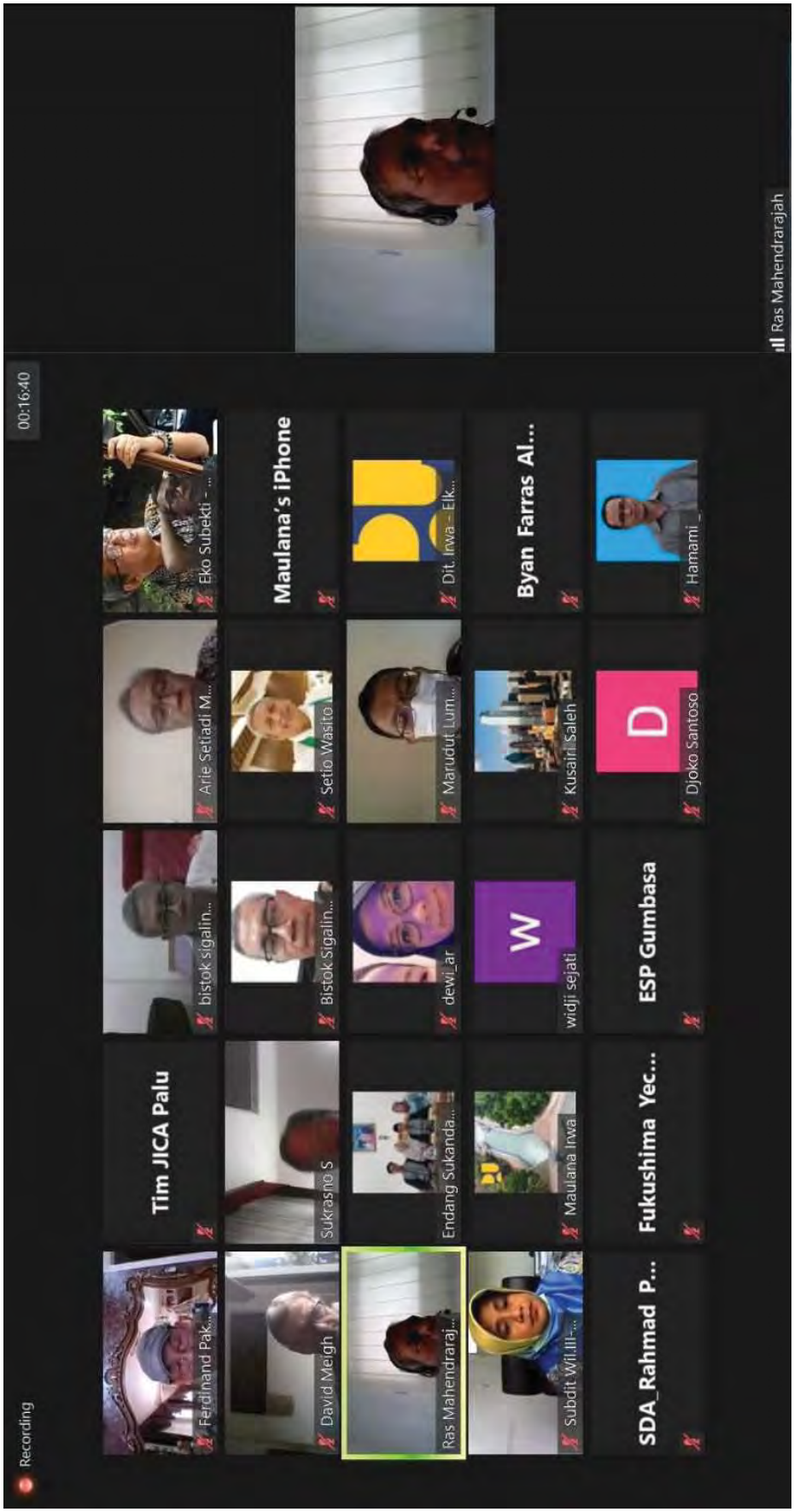
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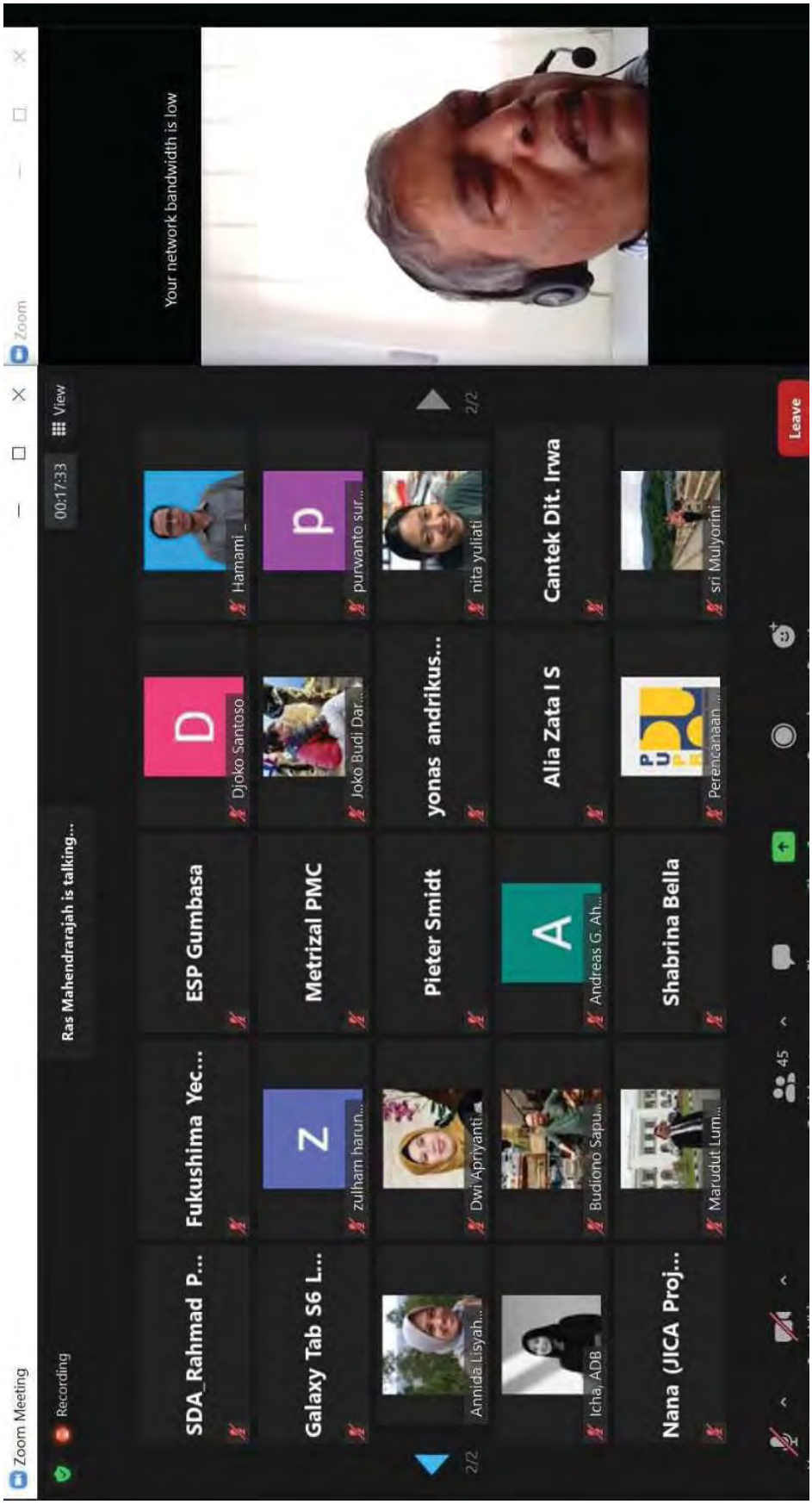
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Memo of Meeting

Project title	Project for Development of Regional Disaster Risk Resilience Plan in Central Sulawesi
Date	Januari 27, 2021 (Wed) 14:00-17:00 WITA
Location	Virtual meeting via Zoom
Attendees	Force Task for Central Sulawesi Disaster Management, Ministry of PUPR : Mr. Arie Setiadi Moerwanto (Chairperson) Head of Sulawesi River Basin III (BWS III) Head of Sub-Directorate of Management of Foreign Loans and Grants Directorate of Irrigation and Swamps : Head of Regional Sub-Directorate III Head of Sub-Directorate of Technical Planning Technical Advisor Team : Ir. Soekrasno, Dipl. HE Ir. Eko Subekti, Dipl. HE (HATHI) Ir. Bistok Sigalingging, M.Sc Ir. Ferdinand Pakpahan, M.E Director team Treasurer of Force Task of The Directorate of Irrigation and Swamp Leader Project Management Consultant Consultant Team Management Team ADB Team Mr. David Meigh Mr. Peter Smidt PPC Team for Gumbasa Irrigation Project, Palu: Mr. Mahendraraj Ras (Team Leader) Mr. Endang Sukandar (Coordinator) Mr. Widji Sejati (Structural Design Engineer) Mr. Djoko Santoso (Hydrological Design Engineer) Mr. Joko Budi (Hydrological Design Engineer) Dr. Sukirman (Geotechnical, Tadulako University) Mr. Junichi Fukushima JICA Team Jakarta JICA Team Palu

Objective of Meeting	Discussion and Sharing of the Detail Rehabilitation of Gumbasa Irrigation Dam (Package 1A) on Engineering Service Project (ESP) work on Gumbasa
Meeting material	Presentation Files : • Presentasi Bendung 27 Januari 2021.ppt

Summarizes

Several things should be noted that can be revised and rechecked on the final design concept of the PPC Team:

1. Need to make a flushing channel
2. The contour and elevation maps in the design have not confirmed each other. There is a difference in elevation of 3 m in the river area, which indicates a reduction in sediment in the river as high as 3 m (Mr. Soekrasno). It is necessary to check between the design and field conditions.
3. Based on technical analysis, the flood water level elevation above MErcu which can still be calculated based on KP-02 is that it has 1000 or 100 years of the return period, but a larger value can be chosen. Supposedly for the 100 year return period plus Q work, so the value that can be taken is 97.2. If this value is to be taken, the consequence is that part of the bridge will be affected. There must be maintained and there is an OP.
4. The embankment design must include access to the embankment.
5. Based on experience, it is necessary to have support (support column) or horizontal bracing, because otherwise, the construction will easily collapse (not strong enough). (Weir Plan with Boulder Rack Option-2)
6. Agree to add the safety bar so that during the flood there is still access.
7. Agree to have the reparation and cleaning, because it requires to repair and needs cleaning, for example using a blower to clean the jammed existing pipe.
8. Regarding the irrigation landscape, the main point is not to make this area central tourism, but if there are people who want to see irrigation buildings, a place can be provided. Because there is no operational maintenance other than the function of the building itself. The budget for landscape is not more than 15% of the budget, maybe around 5 - 8 M.
9. PU nomenclature needs to appear in the landscape, for example in the name of dams and irrigation, there is more greening, but it doesn't have to be luxurious. In principle, a good landscape proposal only needs adjustments related to the cost that is too large. With a very large landscape area, it is also necessary to protect the environment, water, buildings, and maintenance in the OP later. The costs required for the landscape design presented are enormous.
10. Agree with the proposal to make a concept that is open and not too massive. The concern is that the trap design will disappear. The point is to highlight its main function, this should not be lost.
11. Diameter of the stone for the riprap to be used: specific gravity 21, diameter 70 cm (technical advisor advice> 35 cm to withstand swift water).
12. There is material on top of the boulder. This will be taken into account in budget analysis. Possibly not requiring large transport costs (Mr. Mahe).

13. Sediment calculation is already done. But for the existing, still not calculate following the contract. It's very expensive.
14. Electricity resources will be provided by Genset. Will follow the advice to higher the Genset location to a safe place. At least the height of the bridge. (The technical advice is to make a generator house with the floor position of the generator set at least the same level so that it is not flooded, because if it is flooded, the electricity will die and flooding is inevitable. Case study of Central Sumatra, Pice Dam)

General issues :

1. Regarding the utilization of multipurpose hall as one of Gumbasa facilities, confirming that there are several workshops programs available and get from the ministry direction. We will be adding the workshop cost to the budget.
2. There will be several public consultations and already did some of them.
3. Need to have a special discussion related to the Gumbasa project, so that can be integrated between the Gumbasa project (ADB program) and the project that includes in the JICA program.
4. Regarding debris flow, further discussion and re-consultation is needed in a separate meeting. The ADB PPC Team and the JICA Team will have an in-depth discussion.
5. Regarding the liquefaction area, if there is already a mapping and zoning for areas prone to liquefaction, then the area should be treated separately. For example, specifically for liquefaction areas, special treatment does not need to use a floating system.
6. Next week is scheduled as a further discussion on handling liquefaction; groundwater level and sediment trap.

Contents

- Pre-Opening by Mrs. Asmelita (Regional Sub-Directorate III, Irrigation and Swamps)
- Presentation by the PPC Team (Opening by Mr. Mahendraraj)
- Introducing of the consulting team attendees.

(**Material : 1. Presentasi Bendung 27 Januari 2021.ppt**)

Agenda : Final Design Gumbasa (Mr. Widji Sejati)

- There are some changes in the design presented by the consultant team.
- There are some problems along the Gumbasa irrigation dam (PPT, slide 4)
- Submission of the scope of work and the agreements took.
- Analysis of the problem, technical data on the elevation of the floodwater level above the top of irrigation building and the downstream of the weir, the stability to erosion under the weir, flushing channel (hydro-sandtrap, etc)
- Explain about why need to make a flushing channel

Ir. Bistok Sigalingging, M.Sc

- Requesting an elevation data check with sharp gradations.
- Determining how many undulations of the flushing.
- The contour and elevation maps in the design do not confirm each other. The hydraulic system does not run if there are elevation errors, therefore it is necessary to check if the

data is correct or not in the field, then there should be an explanation so that it can answer Mr. Soekrasno's question about the reduction in sediment in the river as high as 3 m.

Mr. Purwanto Sudiroharjo

- Confirming that already checked the elevation, but will re-check the contouring.

Ir. Soekrasno, Dipl. HE

- If there is a difference in elevation in Geodetic data, it can be a problem in itself. If what Pak Arie clarifies is about 40 cm, the difference in elevation is still acceptable.
- Based on KP-02, it can have 1000 or 100 years, but a large value is chosen. Supposedly 100 yrs plus Q-work. The takeable value is 97.2 because of the range from 97.7 to 96.15.

Ir. Eko Subekti, Dipl., HE (HATHI)

- Worried that the capacity in the weir is still theoretical unless the existing profile conditions have been calculated. Another concern is that another stream is being dammed so that if it is full and surges out.

Mr. Arie Setiadi Moerwanto

- It will be fine if the flood level can still be raised until the bridge. But the concern is that if the Q1000 is taken then there is a part of the bridge that will be hit. So that the value taken is 97.2. The key that is suggested is maintenance. Must be in the OP.
- The embankment design must include access to the embankment.
- Checking the existing floor, for fear of cracks, it is necessary to make a water stock extension joint
- Based on experience, it is necessary to have a support column or horizontal barrier, otherwise, the construction will collapse (not strong enough). (Weir Plan with Boulder Rack Option-2)
- Agree to add the safety bar.
- Agree to have the reparation and cleaning.

Mr. Mahendrarajah

- Checking the structure is only can be done during construction due to the conditions place under the river.
- There was a new proposal, but after discussion, the design was changed to a concrete one beam.
- Agree with adding a safety bar suggestion so that during the flood there is still access.
- Repairing and cleaning are needed, for example using a blower to clean jammed existing pipes.

II. Landscape Design, presented by Marudut Lumbanbatu

Ir. Soekrasno, Dipl. HE

- Compare to the right section, the left one has so many problems.
- The landscape construction of the area around Gumbasa is considered luxurious.
- The budget figure should be decreased for landscape structural between 5 - 8 Million (about 10-15% only not above)

- The main point is not to make the Gumbasa Irrigation area as central tourism, but if someone wants to see the irrigation buildings, a place can be provided. Because there is no operational maintenance other than the function of the building itself.

Mrs. Asmelita

- PU nomenclature needs to appear in the landscape, for example naming dams, and irrigation set with more greening. But agree with Mr. Soekrasno′s suggestion that no need to be too fancy. The viewing post does not need to be this luxurious. Maybe 15% of the proposed nominal.
- With a very large landscape area, it is necessary to protect the environment, water, buildings and maintenance in the OP later.
- In principle the landscape design is good enough, but it involves too much cost.

Mr. Joko

- There is no water on the left side.
- Confirming that makes it expensive is the road construction.

Ir. Eko Subekti, Dipl., HE (HATHI)

- The main building is the renovation of the existing building.
- The existing building should be demolished and do the renovation becomes an operational building including the meeting room. Set the new construction will make it be expensive.

Mr. Marudut Lumbanbatu

- The building size capacity plan is about 400 people. This figure is based on the fact that this place is under heavy visits.
- With the existing landscape, for example, training in agriculture and irrigation systems can be held. People who come to the dam for a tourist purpose.
- Agree that the funds will be cut according to save the budget.

Mr. Arie Setiadi Moerwanto

- The concern of the landscape design is should fullfill the question, what concepts do you want to encourage in managing this landscape?
- What training will be held in the area. The real condition is the weather in the field is very hot and especially in this current situation during a pandemic people should not gathering in one location.
- Proposals to make a concept that is open and not too massive. The concern is that the trap design will be disappeared from the massif landscape design. The point is to highlight its main function, don't lose it.

Ir. Ferdinand Pakpahan, ME

- Regarding the price, what is the expected stone diameter and where the source will be taken from in the riprap design?

- The foundation of the wall where the wing is cracked to be filled with cement, what is the condition whether it has been confirmed whether the crack is open or just the wall.
- Has the embankment curve been studied, the concern is that when floods occur in 100 years it will be eroded
- Boulder which is full of sediment is there a count of sediment transportation. What is done to determine the sediment transportation so that we know what percentage is entered and left outside?
- Technical analysis, there is a boulder with 781 kg, what is the diameter of the boulder, it should be above 35cm to compensate for the swift water.
- Where is the source of electricity taken, whether from PLN and reserved from the generator. This will involve costs.
- It is necessary to construct a generator house, the position of the generator floor should be at least the same level so that it is not flooded, because if it is inundated, the electricity will go out and flood. (Central Sumatra study case, Pice dam)
- Is there a workshop, that will be filled as this is included in the financing plan.
- Whatever is done, the main thing is the Public Consultation Meeting to get an agreement from the start to the monev project.

Mr. Mahendrarajah

- Diameter for riprap, with specific gravity 21, diameter 70 cm.
- There is material on top of the boulder. This will be taken into account in budget analysis. Probably no need for transport.
- Sediment calculation already done. But for the existing, still not calculate following the contract due to the price is very expensive.
- Electricity resources will be provided by Genset. Will follow the advice to higher the Genset location in a safe place. At least the height of the bridge.
- Workshop available and get from the direction and will add the cost.
- There will be several public consultations and already did some.

Mr. Widji Sejati

- Cracks in the foundation have been studied. It will be checked again later

Mr. Arie Setiadi Moerwanto

- Need to have special discussions related to the Gumbasa project, so that can be integrated between the Gumbasa project and the projects which include the JICA program.

Mr. Junichi Fukushima

- It needs further discussion regarding the debris flow, need to re-consult

Mr. Mahendrarajh

- Regarding the liquefaction issue, at the moment the design is not really discuss about the countermeasure for the liquefaction

- What is the choosing type of plant that can be decided together to plan in the liquefaction area?

Ir. Soekrasno, Dipl. HE

- If choose a conventional system for rice, which needs 2-4 mm/day then it will be contributed to groundwater distribution
- Ideally choosing Horticulture or Palawija is the alternative choice that does not use a floating system. But this is a long way to make the farmers follow and change the habitual plantation.

Ir. Bistok Sigalingging, M.Sc

- Have there been any studies in areas prone to liquefaction?
- If mapping and zoning already exist, it is better if only the areas that are prone to liquefaction are treated separately.
- The treatment is differentiated, especially for liquefaction areas, special treatment does not use a floating system.

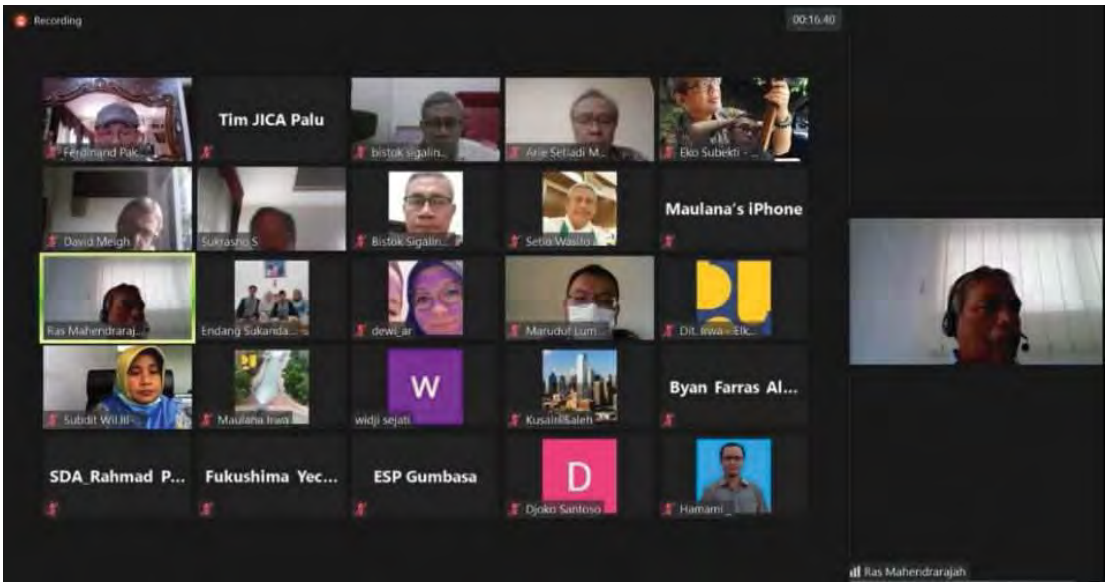
Mr. Junichi Fukushima

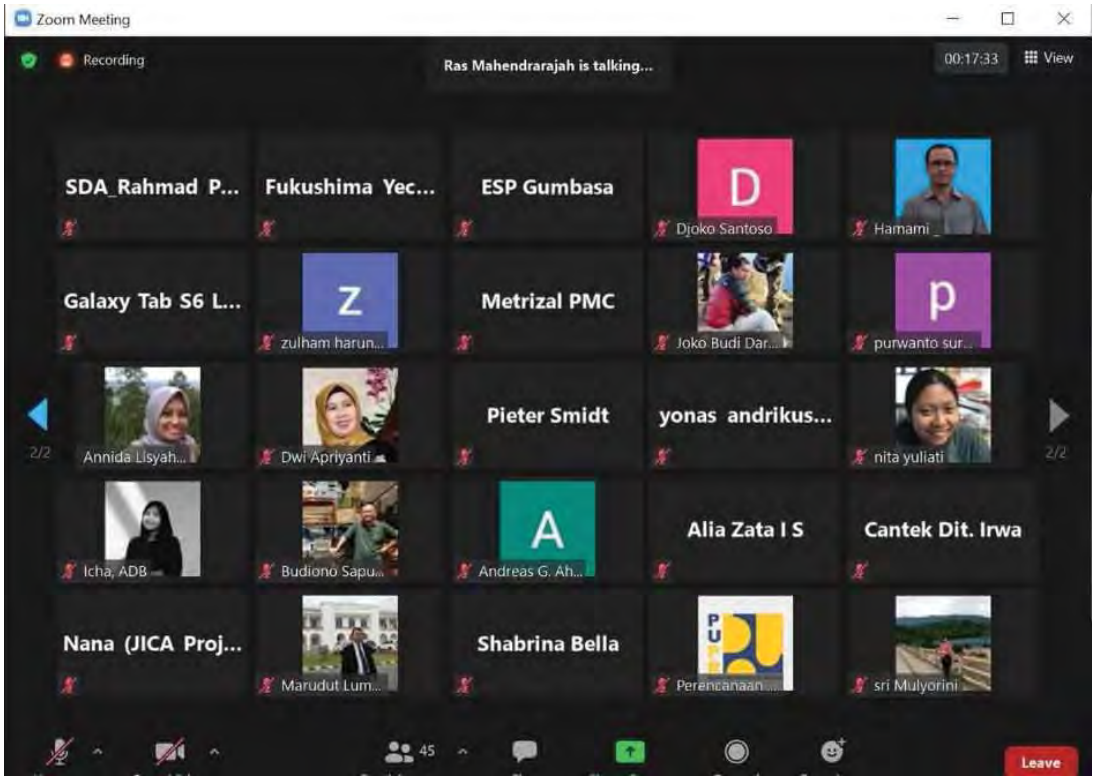
- Each has a step.
- Will confirm at the meeting next week for further discussion on handling liquefaction; groundwater level and sediment trap.

Mr. Mahe

- Did not carry out sediment trap analysis again in design for now. Will explain specifically, looking for time in the next week.

Documentation





[END]

REFERENCE MATERIAL FOR GUMBASA IRRIGATION

UNDER

INFRASTRUCTURE RECONSTRUCTION SECTOR LOAN IN CENTRAL SULAWESI PROVINCE

(IRSL PROJECT; JICA IP-580)

Yachiyo Engineering Co.,Ltd Jakarta Office

February 25, 2021

Contents

APPROCH

- Issues to be resolved
- Solution
- Basic conditions for the foundation design of this project
- Precautions for sediment control

POLICY

- Watershed characteristics
- Causes of sediment generation in mountainous areas
- Facilities to be protected from sediment runoff and damage in downstream areas

FACILTY PLANNING

- Proposal of Urgent Work for Downstream Area

FUTURE ISSUES

- The need for water resources development planning
- Sediment control proposals in areas of major sediment sources

OTHER COMMENT FOR D/D IRRIGATION SYSTEM

JICA-TATeam

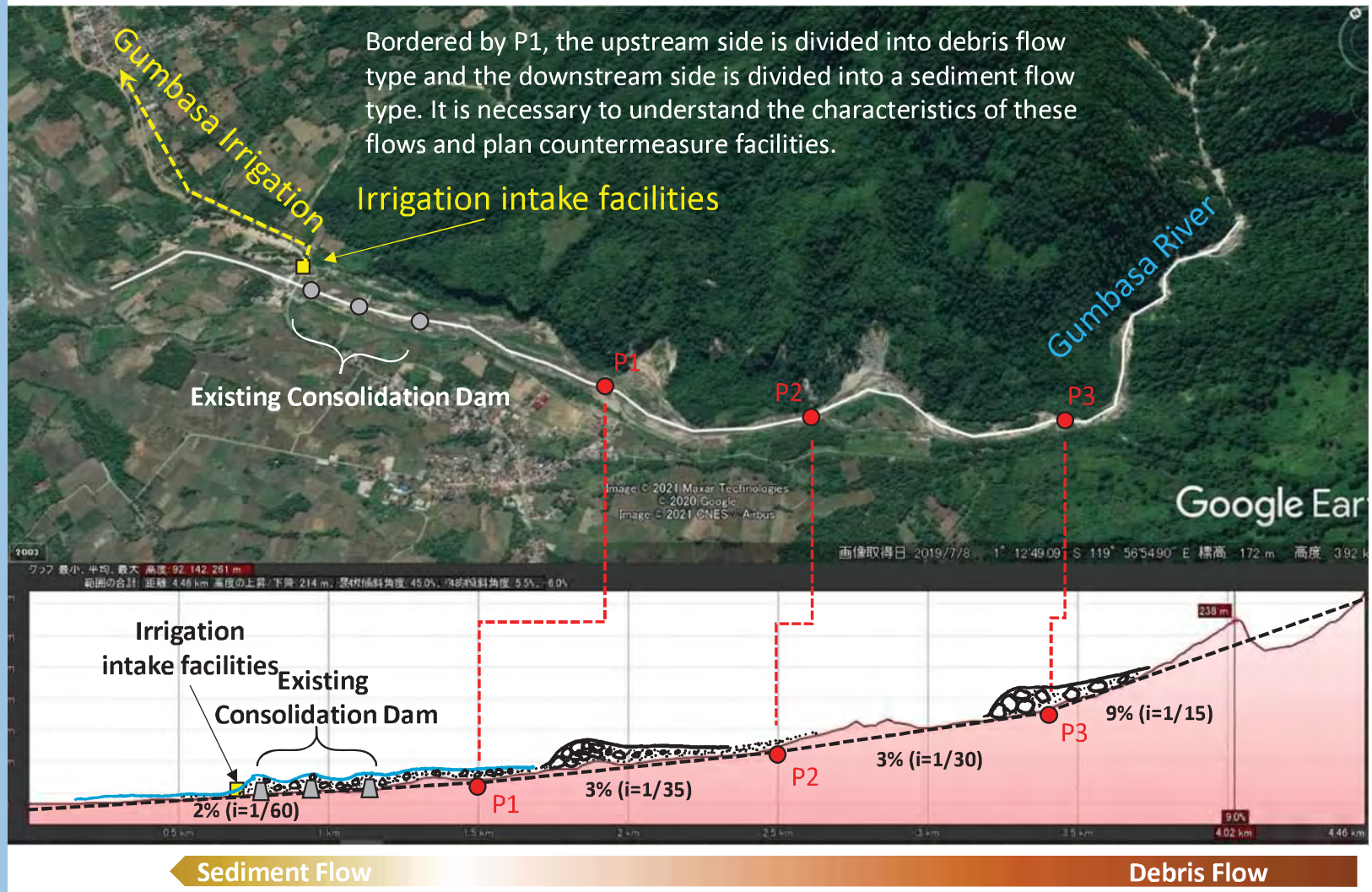
POLICY

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

Estimating sediment runoff in the downstream area

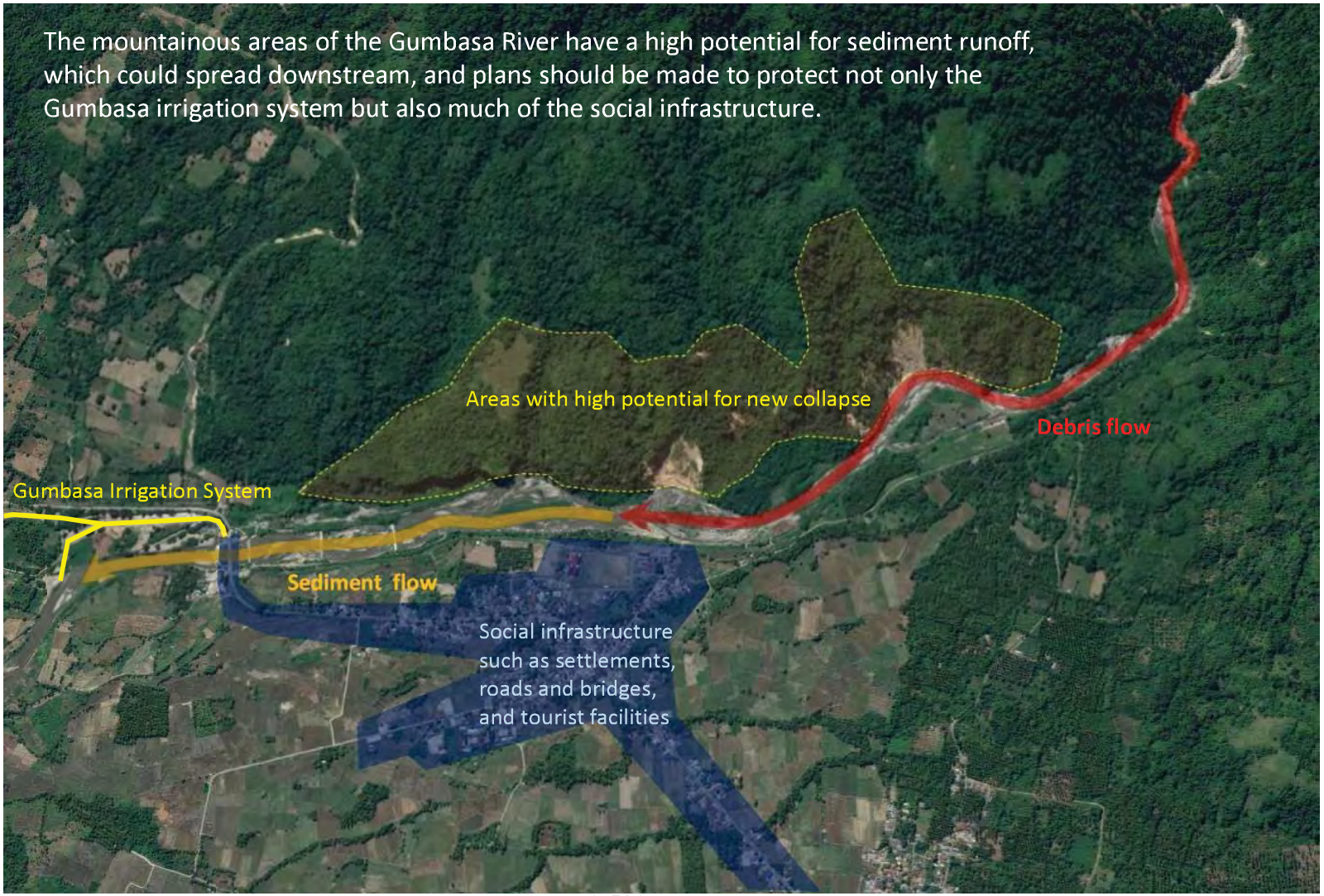


Bordered by P1, the upstream side is divided into debris flow type and the downstream side is divided into a sediment flow type. It is necessary to understand the characteristics of these flows and plan countermeasure facilities.

Sediment Flow — Debris Flow

JICA-TAT team

Facilities to be protected from sediment runoff and damage in downstream areas



JICA-TATEAM

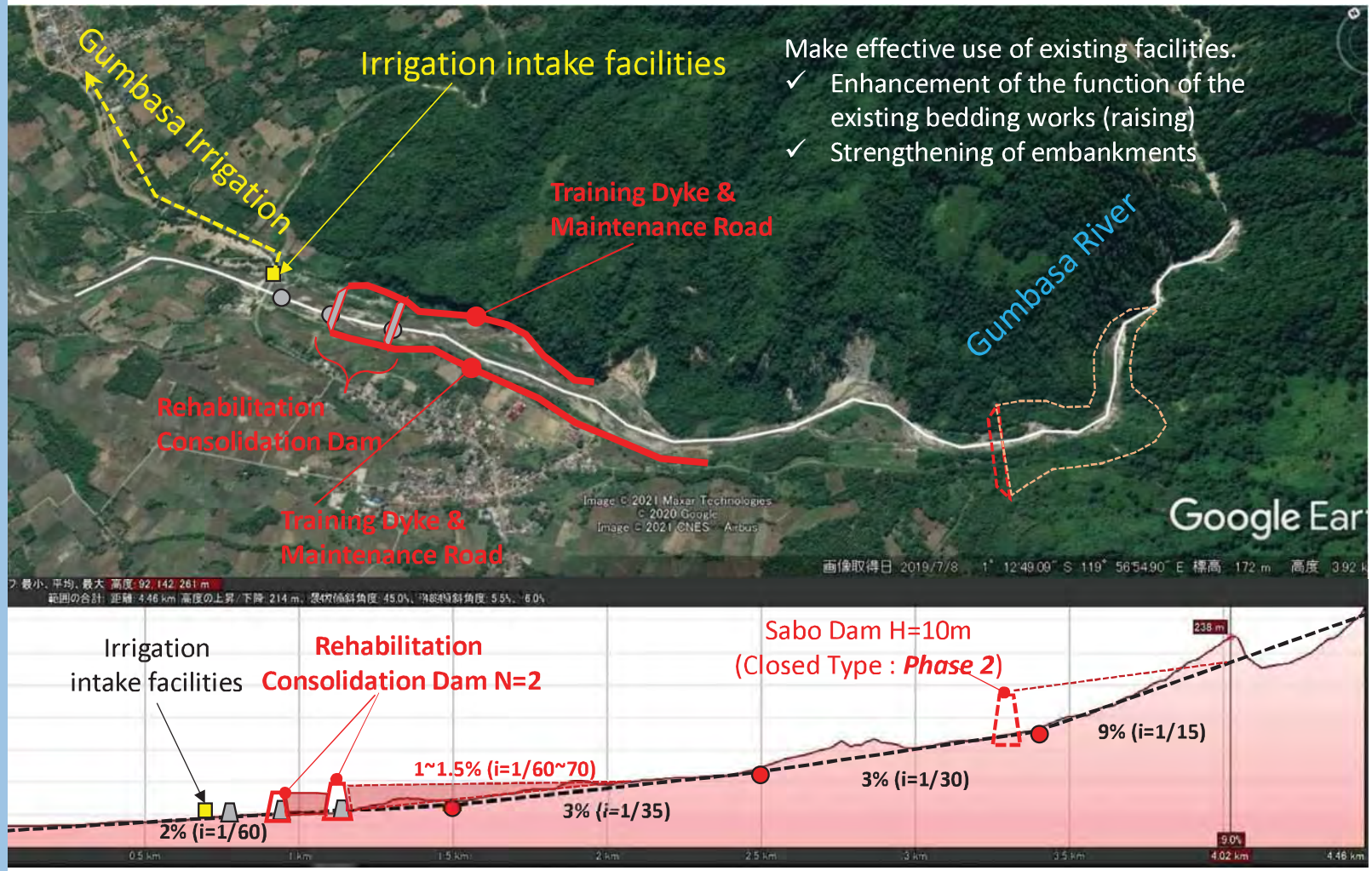
FACILITY PLANNING

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

Proposal of Urgent Work for Downstream Area (Plan A)



Make effective use of existing facilities.

- ✓ Enhancement of the function of the existing bedding works (raising)
- ✓ Strengthening of embankments

JICA-TAT Team

Proposal of Urgent Work for Downstream Area (Plan A)

Urgent works are mainly proposed to utilize the existing social infrastructure and upgrade its functions.

Items	Quantity*	Spec*
Rehabilitation Consolidation Dam	2 set	H=7m (raising the height 2m) Apron works (riverbed protection)
Training Dyke & Maintenance Road	2.2 km	H=4m, W=3m, Embankment Structure + Stone Protection L= 2.2 km (right 0.9km + left 1.3km)
Ancillary Facilities	1 set	Access road for sediment removal Irrigation water collection equipment Sightseeing facilities

*The specifications must be reviewed during detailed design.

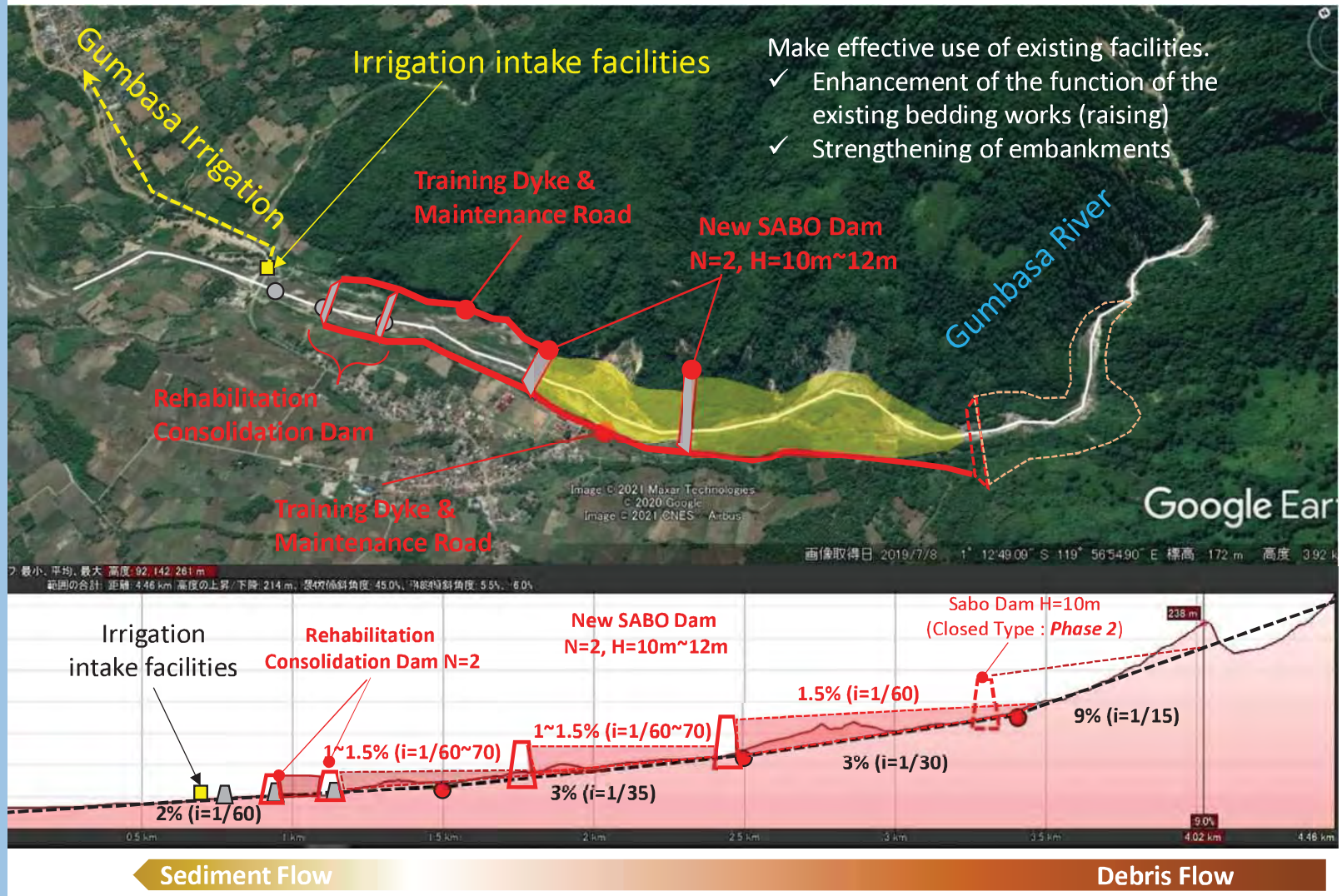

Existing Consolidation Dam2


Existing Consolidation Dam1


Existing Dyke

Photo provided by Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province

Proposal of Urgent Work for Downstream Area (Plan B)



Make effective use of existing facilities.

- ✓ Enhancement of the function of the existing bedding works (raising)
- ✓ Strengthening of embankments

JICA-TAT Team

Proposal of Urgent Work for Downstream Area (Plan B)

Urgent works are mainly proposed to utilize the existing social infrastructure and upgrade its functions.

Items	Quantity*	Spec*
Rehabilitation Consolidation Dam	2 set	H=7m (raising the height 2m) Apron works (riverbed protection)
New Sabo Dam	2 set	H=10~12m
Training Dyke & Maintenance Road	3.2 km	H=4m, W=3m, Embankment Structure + Stone Protection L= 3.2 km (right 0.9km + left 2.3km)
Ancillary Facilities	1 set	Access road for sediment removal Irrigation water collection equipment Sightseeing facilities

*The specifications must be reviewed during detailed design.


Existing Consolidation Dam2


Existing Consolidation Dam1


Existing Dyke

Photo provided by Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province

Proposal of Urgent Work for Downstream Area (Plan B)

JICA-TATeam

Proposal of Urgent Work for Downstream Area (Plan B)

JICA-TATeam

Proposal of Urgent Work for Downstream Area (Plan B)

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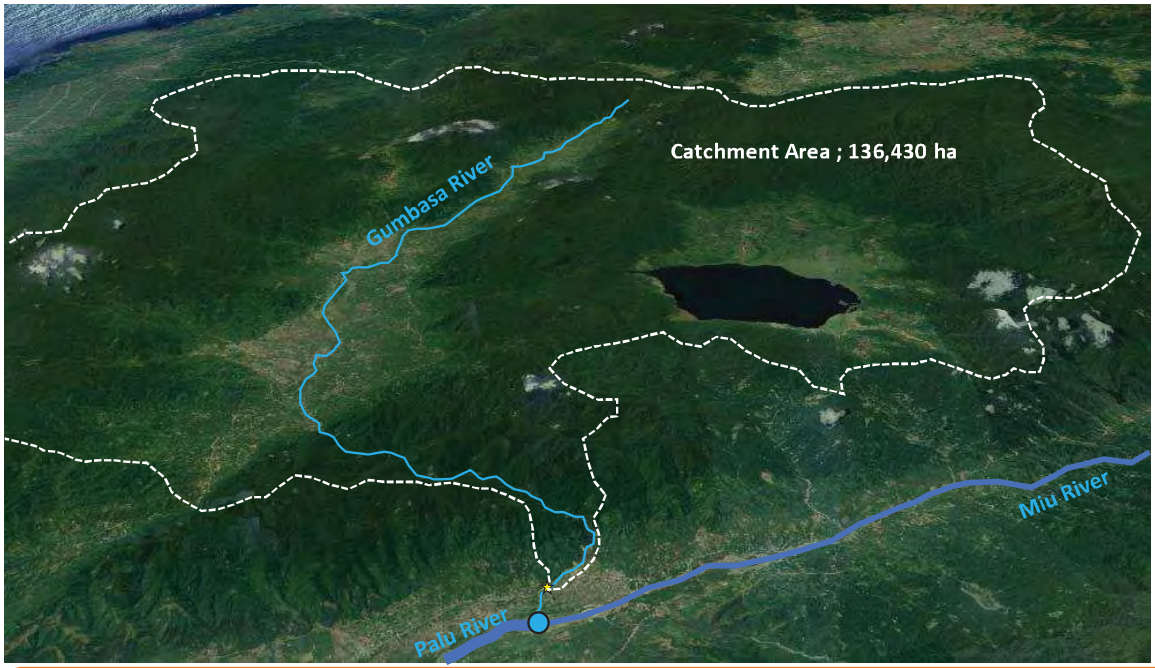
FUTURE ISSUES

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

The need for water resources development planning



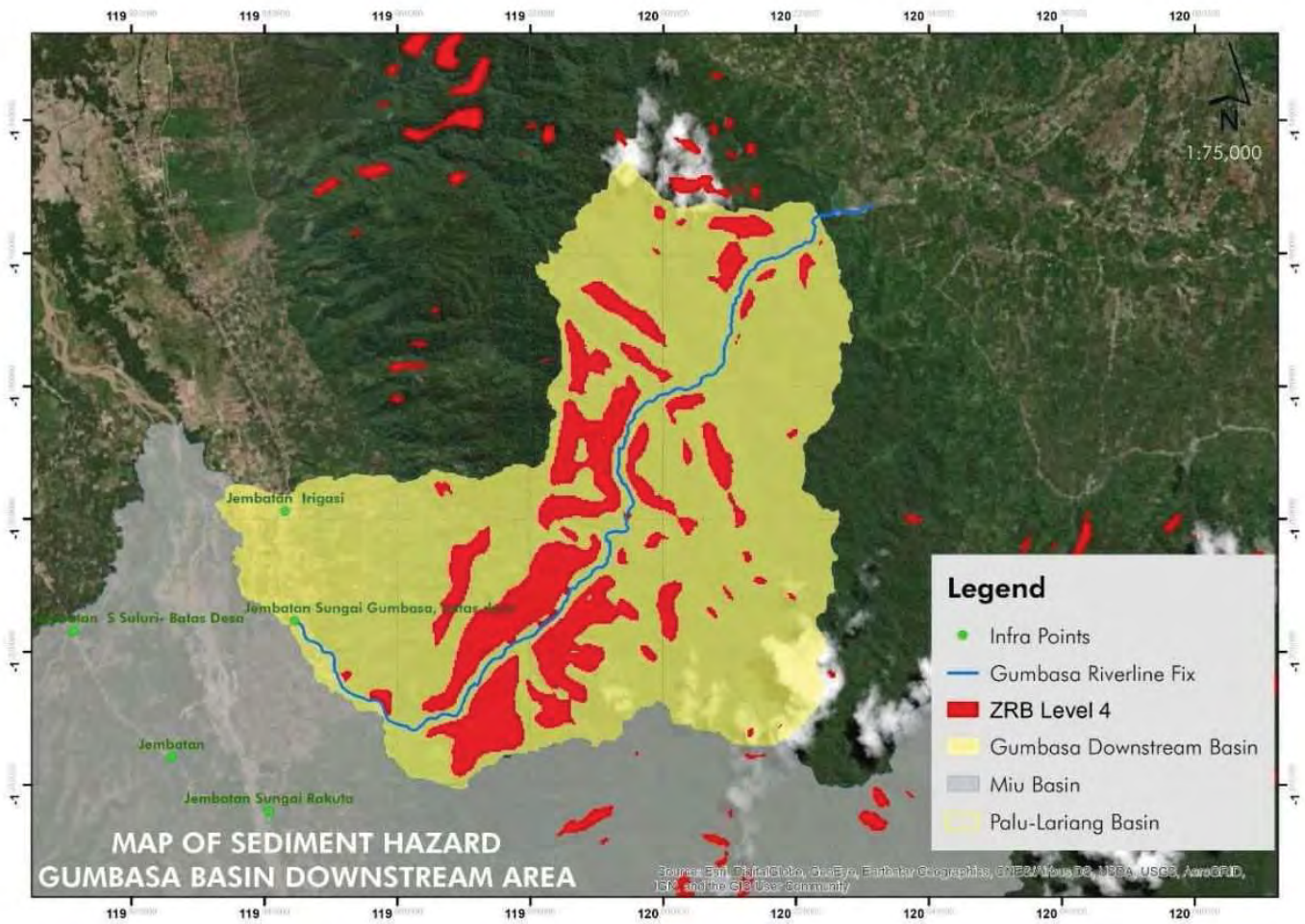
As for water resource development, it is necessary to develop a plan for water use, based on flood control.

Tabel 1: Kebutuhan Air Pada DAS Miu dan Gumbasa Tahun 2009 dan 2030

NAMA DAS	LUAS DAS (Ha)		Q Ketersediaan (Juta m3/th)	Q Kebutuhan Air (Juta m3/th)				Total Q Kebutuhan
				Irigasi	Peternakan	Perikanan	RT, Kota & Penggelontoran	
DAS Miu	69,503.25	Tahun 2009	538.12	66.88	0.23	0.12	3.41	70.63
		Tahun 2030	156.24	1.95	0.27	6.46	164.92	375.20
DAS Gumbasa	136,427.50	Tahun 2009	684.79	267.36	0.54	0.31	13.95	282.16
		Tahun 2030	427.66	4.02	0.60	26.67	458.95	225.83

STUDI POTENSI SUMBER DAYA AIR DALAM MENUNJANG POLA PENGGELOLAAN SUMBER DAYA AIR
(Studi Kasus DAS Miu dan Gumbasa)
Dian Noorvy[1], Kiki Frida Sulistyani[2]
Dosen Jurusan Teknik Sipil, Universitas Tribuana Tungga Dewi, Malang
Alumni S2 Teknik Sipil Universitas Brawijaya, Malang

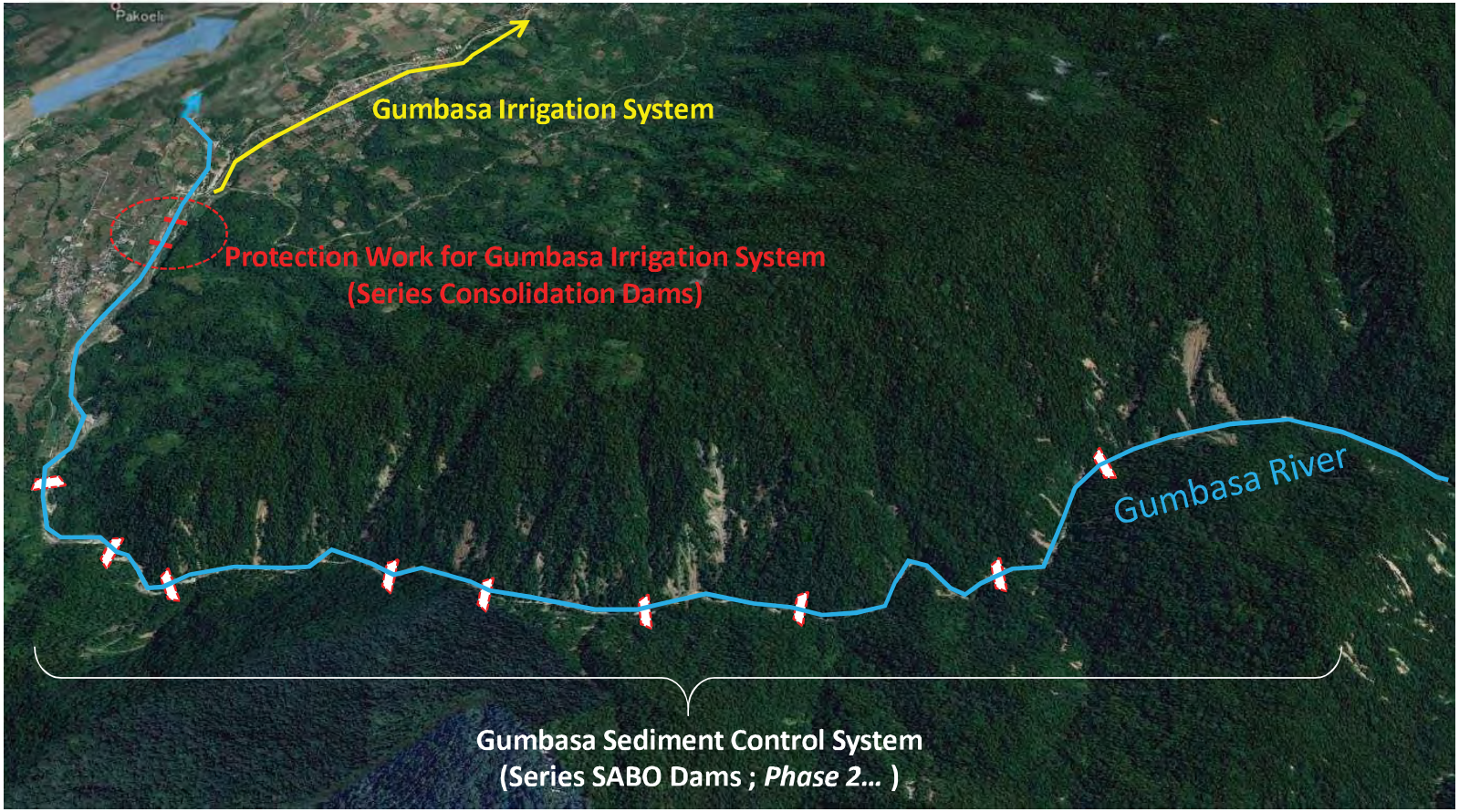
Sediment control proposals in areas of major sediment sources



The JICA-TC project has shown vulnerable areas (high potential for slope failure) in mountainous areas. If this district were to experience a slope failure, a very large amount of sediment would be generated, which could cause significant damage downstream.

JICA-TATEAM

Sediment control proposals in areas of major sediment sources



In line with the Master Plan, a SABO Master Plan for mountainous areas needs to be developed. The figure above is an example.

JICA-TATEAM

Terima Kasih
ありがとうございます。

JCA-TATeam

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
SATUAN KERJA PELAKSANAAN JARINGAN PEMANFAATAN AIR
WS. PALU-LARIANG, WS.PARIGI-POSO, WS. KALUKU-KARAMA PROVINSI SULAWESI TENGAH
Jln. Abd. Rahman Saleh No. 230 Palu (94114), Telp. (0451) 482147 Fax (0451) 482101

Nomor : UM0102/PJSA.ST-BWS13/188 Palu, 10 Maret 2020
Sifat : Penting
Lampiran : 1 exp
Hal : Undangan Diskusi Pelaksanaan Pekerjaan

Yth. Bapak/Ibu (Sesuai Lampiran I)
di Tempat

Sehubungan dengan kegiatan pekerjaan konstruksi di lingkungan Satuan Kerja PJSA WS. Palu-Lariang, WS. Parigi-Poso, WS. Kaluku-Karama Provinsi Sulawesi Tengah TA. 2020-2021, untuk pekerjaan *River Improvement And Sediment Control In Salua River (LOAN JICA IP-580)*. Dengan hormat kami mengundang Bapak untuk menghadiri Dikusi Pelaksanaan Pekerjaan yang akan dilaksanakan pada :

Hari/Tanggal : Jumat / 12 Maret 2021
Waktu : 09.00 WITA - selesai
Tautan Rapat : *Join Zoom Meeting*
ID : 960 6725 8129
Password : PJSA2021

Demikian undangan ini di sampaikan, atas kehadiran Bapak diucapkan terimakasih.

Kasatker PJSA
WS. Kaluku-Karama WS. Palu-Lariang, WS. Parigi-Poso
Provinsi Sulawesi Tengah

Radia Zulfikar, S.T., M.T.
NIP 19731001 200212 1 005

Tembusan :
1. Kepala Balai Wilayah Sungai Sulawesi III Palu (sebagai laporan);
2. Kepala Seksi Pelaksanaan BWS Sulawesi III Palu;

Lampiran I Surat :
Nomor : UM0102/PJSA.ST-BWS13/188
Tanggal : 10 Maret 2021
Hal : Undangan Diskusi
Pelaksanaan Pekerjaan

DAFTAR YANG DIUNDANG

1. PPK Sungai dan Pantai I;
2. Pelaksana Teknik pada PPK Sungai dan Pantai I;
3. Direktur PT. Runggu Prima Jaya;
4. *Project Manager dan Site Engineer* PT. Runggu Prima Jaya;
5. *JICA T/A Team.*

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
SNVT PELAKSANAAN JARINGAN SUMBER AIR
WILAYAH SUNGAI PALU-LARIANG, WILAYAH SUNGAI PARIGI-POSO, WILAYAH SUNGAI KALUKU-KARAMA PROVINSI SULAWESI TENGAH
Jl. Abd.Rahman Saleh No.230 Palu (94114).Telp. (0451) 482147, Fax (0451) 482101

Palu, 09 Maret 2021

Nomor : UM.01.02/BWS13/PPKSDPII-SNVT-PJSA-SULTENG/26
Sifat : Penting
Lampiran : 1 Berkas
Hal : **Undangan Rapat Pembuktian (*Show Cause Meeting* /SCM II)**

Yth.
Bapak/ Ibu (Daftar Terlampir)
di Tempat

Berdasarkan hasil rapat SCM pada tanggal 23 Februari 2021 telah disepakati untuk melakukan uji coba dalam jangka waktu 14 hari kalender dengan menambahkan jumlah tenaga kerja beserta peralatan dilapangan untuk mengejar ketertinggalan progres di lapangan. Namun progres realisasi fisik pekerjaan sampai saat ini masih masuk dalam kategori kritis (SSUK Pasal 44 Butir 44.2.a) yaitu sebesar 23.51% dari progres rencana fisik pekerjaan sebesar 53.16% telah terjadi deviasi minus (-) 29.65%, maka dengan ini kami mengundang saudara untuk hadir pada rapat pembuktian (*Show Cause Meeting/SCM II*) pekerjaan ***River Improvement and Sediment Control In Paneki River*** Kontrak Nomor : HK0201/PPK-SDPII-PJSA.ST-BWS13/17, tanggal 05 Oktober 2020, yang akan dilaksanakan pada :

Hari / tanggal	:	Jumat, 12 Maret 2021
J a m	:	13.30 WITA sampai selesai.
Tempat	:	Ruang Rapat PPK Sungai dan Pantai II, SNVT PJSA WS. Palu-Lariang, WS. Parigi-Poso, WS. Kaluku-Karama Provinsi Sulawesi Tengah (Jl. Gereja Manimbaya)
Agenda	:	Pembahasan **Action Plan** Percepatan Pekerjaan di Lapangan

Demikian Undangan ini kami sampaikan, atas perhatian dan kehadiran Bapak/ Ibu diucapkan terima kasih.

PLT.PEJABAT PEMBUAT KOMITMEN
SUNGAI DAN PANTAI II,

RANGGA ARDIANSAH, SH., ST
NIP. 19780331 200911 1 002

Tembusan disampaikan Kepada Yth. :
1. Kepala Balai Wilayah Sungai Sulawesi III (sebagai laporan).

Lampiran Surat:
Nomor : UM.01.02/BWS13/PPKSDPII-SNVT-PJSA-SULTENG/26
Tanggal : 12 Maret 2021
Hal : Undangan Rapat Pembuktian (*Show Cause Meeting* /SCM)

DAFTAR UNDANGAN:

1. Kepala Seksi Pelaksanaan Balai Wilayah Sungai Sulawesi III
2. Kepala SNVT PJSA WS.Palu-Lariang, WS. Parigi-Poso, WS. Kaluku-Karama Provinsi Sulawesi Tengah
3. Koordinator Pengawas
4. Pimpinan Cabang PT. KARYA PEMBANGUNAN REZKI untuk pekerjaan *River Improvement and Sediment Control in Paneki River*
5. *Project Manager* PT. KARYA PEMBANGUNAN REZKI untuk pekerjaan *River Improvement and Sediment Control in Paneki River*
6. JICA TA *Team*

Lampiran Surat:
Nomor : UM.01.02/BWS13/PPKSDPII-SNVT-PJSA-SULTENG/26
Tanggal : 12 Maret 2021

EVALUASI TERHADAP SCM - I

1. Pencapaian harian pekerjaan Beton Siklop K – 175 sebesar 580 m^3 perhari tidak tercapai.
2. Penyediaan Bekisting belum terpenuhi.
3. Jumlah *truck mixer* tidak terpenuhi.
4. Penyediaan alat penunjang lainnya (Concrete, Vibrator, dan Pompa Air) tidak terpenuhi.
5. Metode pemasangan Bekisting tidak terpenuhi.
6. Progress fisik sebesar 42.598% tidak terpenuhi.

Administration

1. Will all packages, including MC-0, proceed with Addndum No.1?
2. Addendum requires EX-Note. BWS-SIII must prepare EX-Note.
3. It is necessary to explain all the circumstances of the contract change.
4. JICA-TA requested a situation photo and BOQ (MC-0) materials to create the Ex-note, but I haven't got all of them. Are all these materials ready?
5. Please explain the process of changing the contract.

JICA-TATeam

JICA-TATeam

Poil

1. Basically, JICA-TA agree with the Sabo Dam 1 structure proposed by the contractor.
2. However, there is a mistake in the structural drawing, so please correct it.
3. It is better to make the sub-dam channel dimensions partial.
4. The position of the side wall should be changed accordingly.

Salua

1. There are no floor plans or vertical profiles. I don't understand the whole thing.
2. The cross section is still a cross section seen from the upstream.
3. It must be corrected to the cross section seen from the downstream.
4. Basically, JICA-TA agree with the Sabo dam 1 and 2 structures proposed by the contractor.
5. Please explain the apron structure downstream of the sub-dam of Sabo Dam 1.

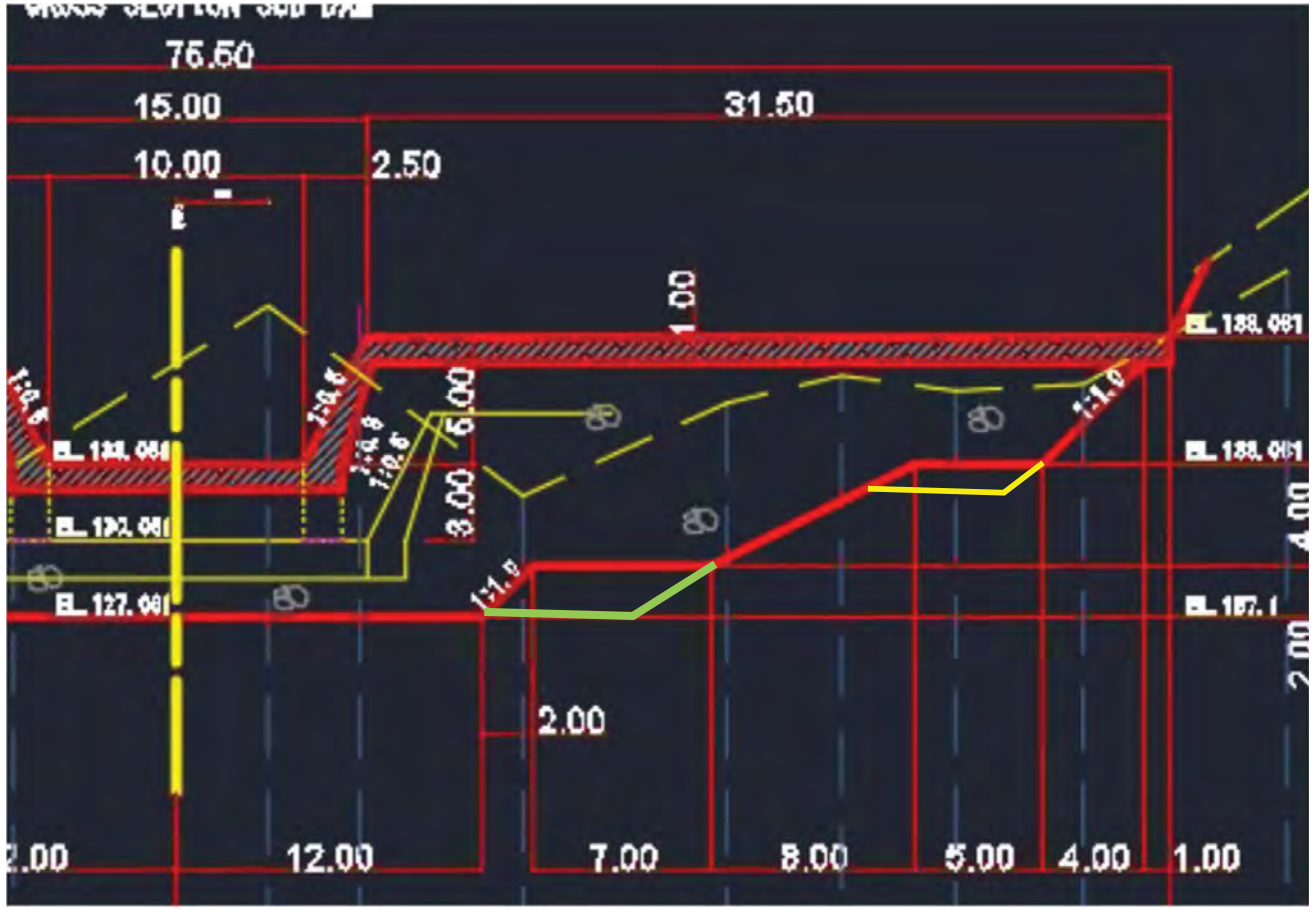
Paneki

1. There was a proposal for additional structures.
2. JICA-TA is considering this.

Urgent inquiry from JICA, Report of each subproject

- Scheduled progress rate and current progress rate
- Contract number
- Contract amount
- Contractor name
- Disbursement situation (application letter required for each bill)

JICA-TATeam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JCA-TATEAM


10.00
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2.50
10.00
24.00
NO. 43
NO. 42
NO. 41

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DIREKTORAT IRIGASI DAN RAWA
Jl. Pattimura No.20 Kebayoran Baru, Jakarta Selatan Telp. 7395626, Fax. 7243633

Nomor : UM 0102 - Ai / 88 Jakarta, 28 April 2021
Sifat : Biasa
Lampiran : 1 (satu) lembar
Hal : Undangan Pembahasan Desain Rekonstruksi Gumbasa BGKn. 24 - 42 (Paket 3) pada Pekerjaan *Engineering Services Project* (ESP) Gumbasa

Yth.
(Daftar Terlampir)
di
Tempat

Dalam rangka pelaksanaan pekerjaan *Engineering Services Project* (ESP Gumbasa), kami mengundang Bapak/Ibu dalam pembahasan Desain Rekonstruksi Gumbasa BGKn. 24 - 42 (Paket 3) yang akan dilaksanakan secara *video conference* melalui **aplikasi Zoom** pada:

Hari/tanggal	: Kamis / 29 April 2021
Waktu	: pukul 13.00 WIB - selesai
Agenda	: Pembahasan Desain Rekonstruksi Gumbasa BGKn. 24 - 42 (Paket 3) pada Pekerjaan *Engineering Services Project* (ESP) Gumbasa
Meeting ID	: **871 5862 9008**
Passcode	: **gumbasa**

Mengingat pentingnya kegiatan tersebut, dimohon kesediaan Bapak dan Ibu untuk bergabung tepat waktu dalam *meeting room* yang telah disediakan. Untuk konfirmasi lebih lanjut dapat disampaikan melalui Saudara Elkha (081320016740).

Demikian disampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.

Direktur Irigasi dan Rawa,

Ir. Suparji, S.ST., M.T.
NIP. 196212311998031030

Lampiran Surat Undangan
Nomor : UM0102-Ai/88
Tanggal : 28 April 2021

DAFTAR PEJABAT/ PEGAWAI YANG DIUNDANG

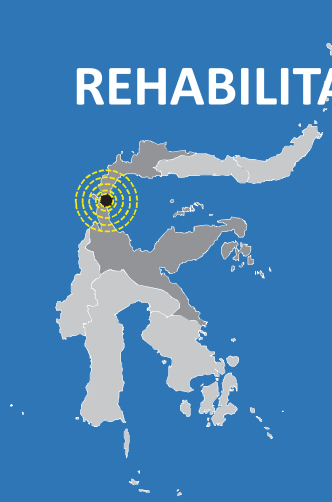
1. Ketua Satgas Penanggulangan Bencana Sulawesi Tengah Kementerian PUPR;
2. Kepala Balai Wilayah Sungai Sulawesi III;
3. Kasubdit Pengelolaan Pinjaman dan Hibah Luar Negeri,Dit. SSPSDA;
4. Kasubdit Perencanaan Teknis, Dit. Irigasi dan Rawa;
5. Kasubdit Wilayah III, Dit. Irigasi dan Rawa;
6. ***Expert Panel* Rekonstruksi Daerah Irigasi Gumbasa:**
   - Prof. Dr. Ir. Masyhur Irsyam MSE;
   - Prof. Ir. Iswandi Imran MA.Sc., Ph.D.;
   - Prof. Dr. Ir. Teuku Faisal Fathani Ph.D.;
   - Ir. Lutfi Faizal.;
   - Mahdi Ibrahim ST., MT.;
7. **Tim Advis Teknis:**
   - Ir. Soekrasno, Dipl. HE;
   - Ir. Eko Subekti, Dipl. HE.;
   - Ir. Bistok Sigalingging, M.Sc.;
   - Ir. Ferdinand Pakpahan, M.E.;
8. **Tim Direksi** Pekerjaan *Project Preparation Consultant (PPC) for Gumbasa Irrigation System and Its Facilities, Palu and Sigi District, Central Sulawesi Province*:
   - Rahmat Suria Lubis, S.T., M.T.;
   - Devi Sri Maulana, S.T., M.T.;
   - Nita Yuliati, S.T., M.T.;
   - Arnold M. Ratu, S.E., S.T., M.T.;
   - Ariesto Krestiadi, S.T., M.Eng.;
   - Dadan Rahmandani, S.T., MPSDA.;
   - Elkha Fathur Anugrah Madjodjo, S.T.;
9. Bendahara Satker Direktorat Irigasi dan Rawa;
10. *Leader Project Management Consultant*;
11. **Tim Konsultan** Pekerjaan *Project Preparation Consultant (PPC) for Gumbasa Irrigation System and Its Facilities, Palu and Sigi District, Central Sulawesi Province*;
12. **Tim Manajemen** Pekerjaan *Project Preparation Consultant (PPC) for Gumbasa Irrigation System and Its Facilities, Palu and Sigi District, Central Sulawesi Province*;
13. **Tim ADB;**
14. **Tim JICA;**

VOL.03

PROPOSALS TO GUMBASA RIVER SEDIMENT CONTROL DRAFT BASIC DESIGN

FOR

REHABILITATION *GUMBASA IRRIGATION SYSTEM*



Junichi FUKUSHIMA
Yachiyo Engineering Co.,Ltd Jakarta Office

March 22, 2021

YACHIYO Engineering

Yachiyo Engineering Co.,Ltd Jakarta Office

YACHIYO Engineering

This discussion paper is proposed as the view of Yachiyo Engineering Corporation Jakarta Office (Junichi Fukushima / Project Coordinator Manager).

As sediment control in Gumbasa River is not covered in the scope of IRSL (JICA IP-580), and the JICA team cannot present its view, because the study by JICA-TA requires permission and approval from JICA, and the process takes time,

However, since the rehabilitation of the Gumbasa irrigation system should be completed as soon as possible, the Jakarta office of Yachiyo Engineering Corporation will provide its own views and support this rehabilitation project.

We hope that you will find this information useful for future reconstruction projects.

Junichi FUKUSHIMA
Project Coordinator Manager
Yachiyo Engineering.,Co.Ltd
Jakarta Office

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YACHIYO Engineering

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- Solution
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- Facilities to be protected from sediment runoff and damage in downstream areas

FACILTY PLANNING

- Proposal of Urgent Work for Downstream Area

FUTURE ISSUES

- The need for water resources development planning
- Sediment control proposals in areas of major sediment sources

OTHER COMMENT FOR D/D IRRIGATION SYSTEM

Yachiyo Engineering Co.,Ltd Jakarta Office

APPROACH

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

YACHIYO Engineering

Issues to be resolved

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The earthquake that occurred on September 28, 2018 has led to a number of slope failures in the upper Gumbasa River basin, resulting in significant sediment runoff.
The water intake facility of the Gumbasa irrigation system has been damaged by the vibration of the earthquake. In addition, sediment flow and debris flows originating from the upper reaches of the Gumbasa River have caused further damage to facilities and sediment accumulation, resulting in reduced water intake functions.

The problem to be solved is to control the debris flow and sediment deposition in order to maintain the normal functioning of the water intake.

There are two major possible impacts of sediment in the Gumbasa River.

(1) Damage to water intake facilities due to direct impact of mudslides
(2) Degradation of water intake function due to sediment accumulation

- ***Provide sediment control at Gumbasa River for abnormal sediment runoff after the 2018 earthquake.***
- ***Gumbasa irrigation system will formulate sediment control measures for normal runoff. Sediment control measures include sediment inflow control works (hard measures) and maintenance measures (including soft measures).***

Solution

YACHIYO Engineering

It is necessary to prevent a direct hit of earth and stone flow to the facility or to take measures to reduce the force of direct hit of earth and stone, and the following two methods are available as countermeasures.

(1) Supplement the debris flow upstream of the water intake facility.
(2) Reduce the velocity of the debris flow to reduce the impact force.

Possible countermeasure facilities are as follows.
(1) Sediment supplementation and sediment volume control by erosion control dams
(2) Slowing down the riverbed gradient by sand pockets and bedding

This proposal proposes a combination of the above two methods.

The above solutions are to control sediment flows and debris flows that occur during large floods, and this methods cannot stop sediment runoff during normal times. In particular, it is estimated that sand and small gravels will be continuously mixed into and washed downstream by the flowing water. Therefore, control of chronically deposited sand and gravel at irrigation channel intakes must be combined with maintenance work.

Basic conditions for the foundation design of this project

YACHIYO Engineering

① It is assumed that this is an emergency project.

② The project is limited to countermeasures against post-earthquake sediment runoff transformations. Countermeasures against sediment and sedimentation that were previously discharged are considered as normal, and are assumed to have been taken into account at the intake and irrigation facilities.

③ The sediment control plan for the entire watershed will not be considered. Therefore, the effects of the facilities are assumed, and will be verified when the master plan is formulated.

④ Select facilities that can be constructed quickly and are considered to be highly effective.

⑤ Since the effectiveness of the facilities is unknown, maintenance and management is always necessary.

Precautions for sediment control

YACHIYO Engineering

The aforementioned countermeasure facility is called a SABO facility, and the items outlined above need to be carried out before its construction.

① Survey of river channel and collapsed area
② Investigation of the nature of the debris flow
③ Rainfall data collection and geological survey
④ Survey and investigation
⑤ Flood analysis and sediment runoff analysis
⑥ Flood analysis and sediment runoff analysis 6) Flood control and sediment control plan (Master Plan)
⑦ Facility layout plan
⑧ Planning of facility construction schedule and selection of priority facilities for construction
⑨ Basic design of priority facilities
⑩ Outline design of priority facilities
⑪ Detailed design of priority facilities

At the beginning of this project, due to the lack of time and data to implement the above items, the procedure will be omitted and only ⑨ will be implemented at a lower design level. When the actual construction starts, the survey data and collected data will be updated and this basic design will have to be reviewed.

POLICY

OF DRAFT BASIC DESIGN

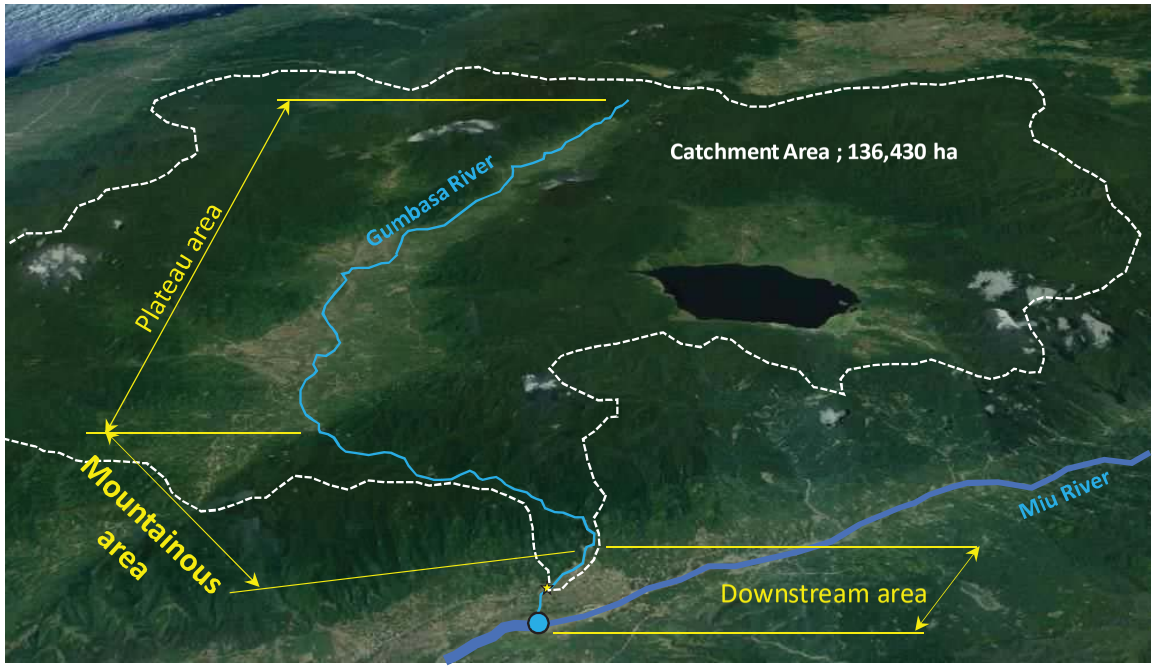
FOR

GUMBASA RIVER SEDIMENT CONTROL

YACHIYO Engineering

Watershed characteristics

The Gumbasa River is 50 km long from the confluence of the Palu River and has a vast basin including the Lindu Lake. It is divided into highland and mountainous areas based on the characteristics of the river.
The Gumbasa River basin can be divided into three major areas based on the characteristics of the river: the highland area, the mountainous area, and the downstream area.
Of these, the areas that produce the most sediment are the mountainous areas and downstream areas.
The mountainous area has a steep riverbed gradient and is the section where mudslides occur and flow down.
On the other hand, the downstream area in (3) is the section where the debris flows and the deposited sediment is moved secondarily.



The Gumbasa River is broadly divided into
(1) Plateau area
(2) Mountainous area
(3) Downstream area.

The main section where sediment is generated after the earthquake 2018 is the **Mountainous area.**

Causes of sediment generation in mountainous areas

The slope collapse on the south slope (right bank side) of the Gumbasa River is remarkable. It is presumed that this collapsed sediment accumulates on the riverbed, and the sediment flows down as a debris flow during a flood.

Reference ;
In the event of a 100-year return period, the total amount of sediment that flows out in a single flood is estimated to be 100,000 m^3 ～500,000 m^3 .
To estimate the amount of sediment runoff, it is necessary to study the geological conditions, rainfall conditions, and river channel conditions in the entire Gumbasa River basin.

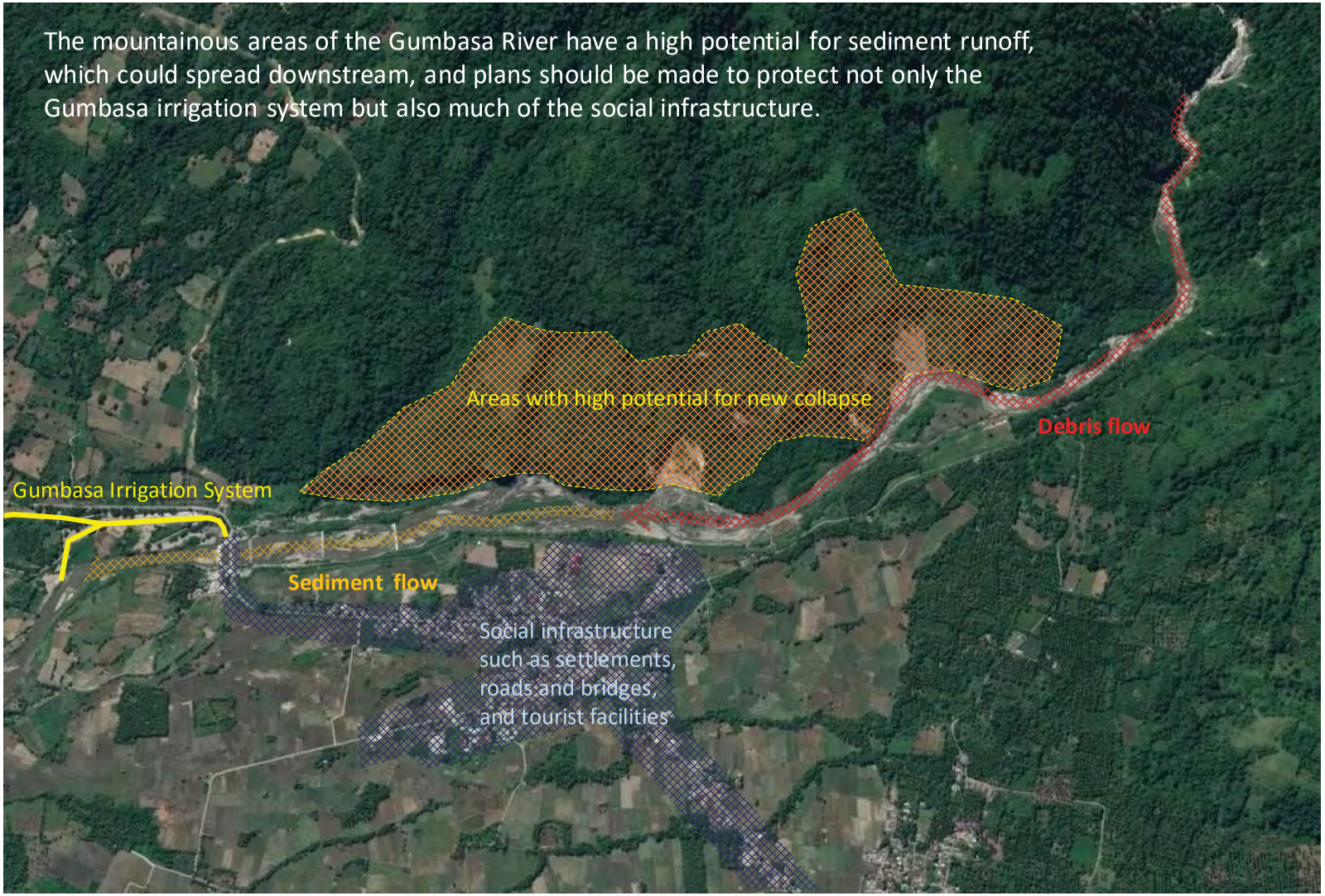
Causes of sediment generation in mountainous areas

YACHIYO Engineering

The mountainous area upstream of the Gumbasa River is subject to many slope failures. The sediment generated here increases the flow rate of the river and causes the river to meander in the downstream fan areas. This causes scouring of the right bank side and new slope failures.
The potential for sediment runoff is very high.

Facilities to be protected from sediment runoff and damage in downstream areas

YACHIYO Engineering



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Estimating sediment runoff in the downstream area

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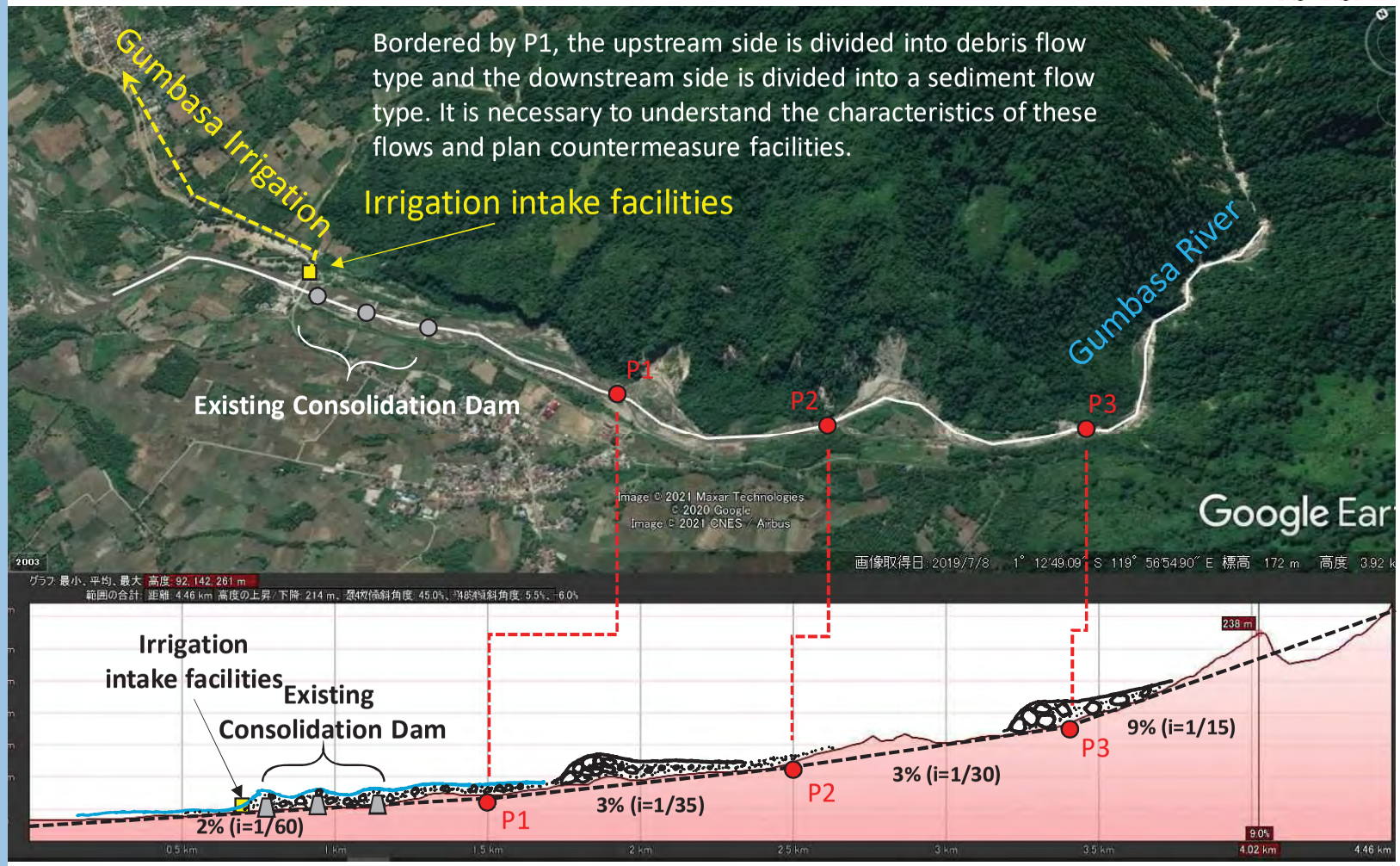

Bordered by P1, the upstream side is divided into debris flow type and the downstream side is divided into a sediment flow type. It is necessary to understand the characteristics of these flows and plan countermeasure facilities.

Sediment Flow → **Debris Flow**

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Causes of sediment generation in mountainous areas

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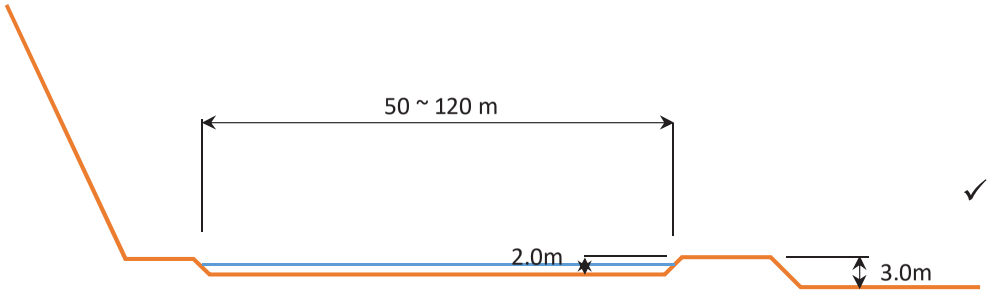

- ✓ The riverbed has been rising since the earthquake. The height of the river bed is already the same as the height of the land inside the bank, or the river bed is higher.
- ✓ The material of the riverbed has an average grain size of about 50 cm. The maximum grain size is 1.0m.
- ✓ There is also a lot of driftwood, with a maximum diameter of 1.0 m and a maximum length of 10 m.

Causes of sediment generation in mountainous areas

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Three bed consolidation works have been installed upstream of the Gumbasa irrigation facility to control the rapid runoff of sediment. The structure is in the form of piles of 20cm steel tube ommision, and only the sediment is supplemented and the flowing water is allowed to pass through.
The structure is aging and is severely damaged.

Yachiyo Engineering Co.,Ltd Jakarta Office

FACILITY PLANNING

OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

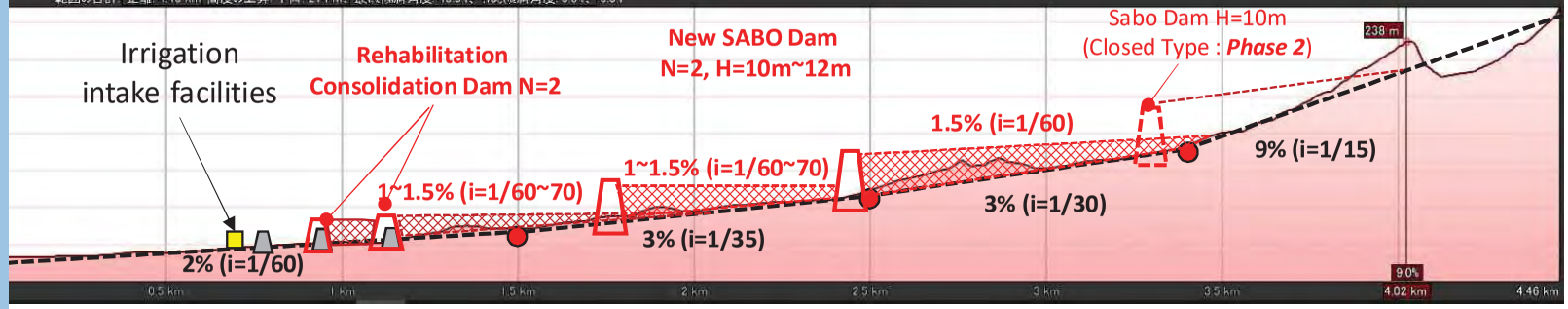
YACHIYO Engineering

Proposal of Urgent Work for Downstream Area (Plan B)

YACHIYO Engineering

Make effective use of existing facilities.

- ✓ Enhancement of the function of the existing bedding works (raising)
- ✓ Strengthening of embankments



Sediment Flow — Debris Flow

Yachiyo Engineering Co.,Ltd Jakarta Office

Proposal of Urgent Work for Downstream Area (Plan B)

YACHIYO Engineering

Urgent works are mainly proposed to utilize the existing social infrastructure and upgrade its functions.

Items	Quantity*	Spec*
Rehabilitation Consolidation Dam	2 set	H=7m (raising the height 2m) Apron works (riverbed protection)
New Sabo Dam	2 set	H=10~12m
Training Dyke & Maintenance Road	3.2 km	H=4m, W=3m, Embankment Structure + Stone Protection L= 3.2 km (right 0.9km + left 2.3km)
Ancillary Facilities	1 set	Access road for sediment removal Irrigation water collection equipment Sightseeing facilities

*The specifications must be reviewed during detailed design.


Existing Consolidation Dam2


Existing Consolidation Dam1


Existing Dyke

Photo provided by Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province

FUTURE ISSUES

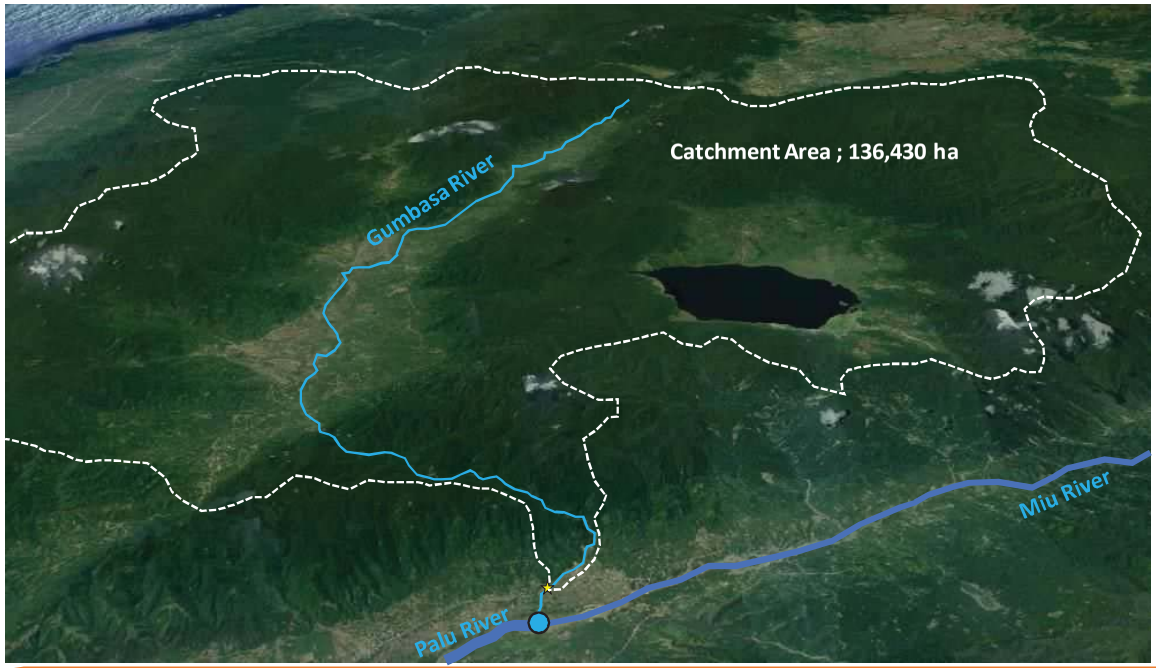
OF DRAFT BASIC DESIGN

FOR

GUMBASA RIVER SEDIMENT CONTROL

The need for water resources development planning

YACHIYO Engineering



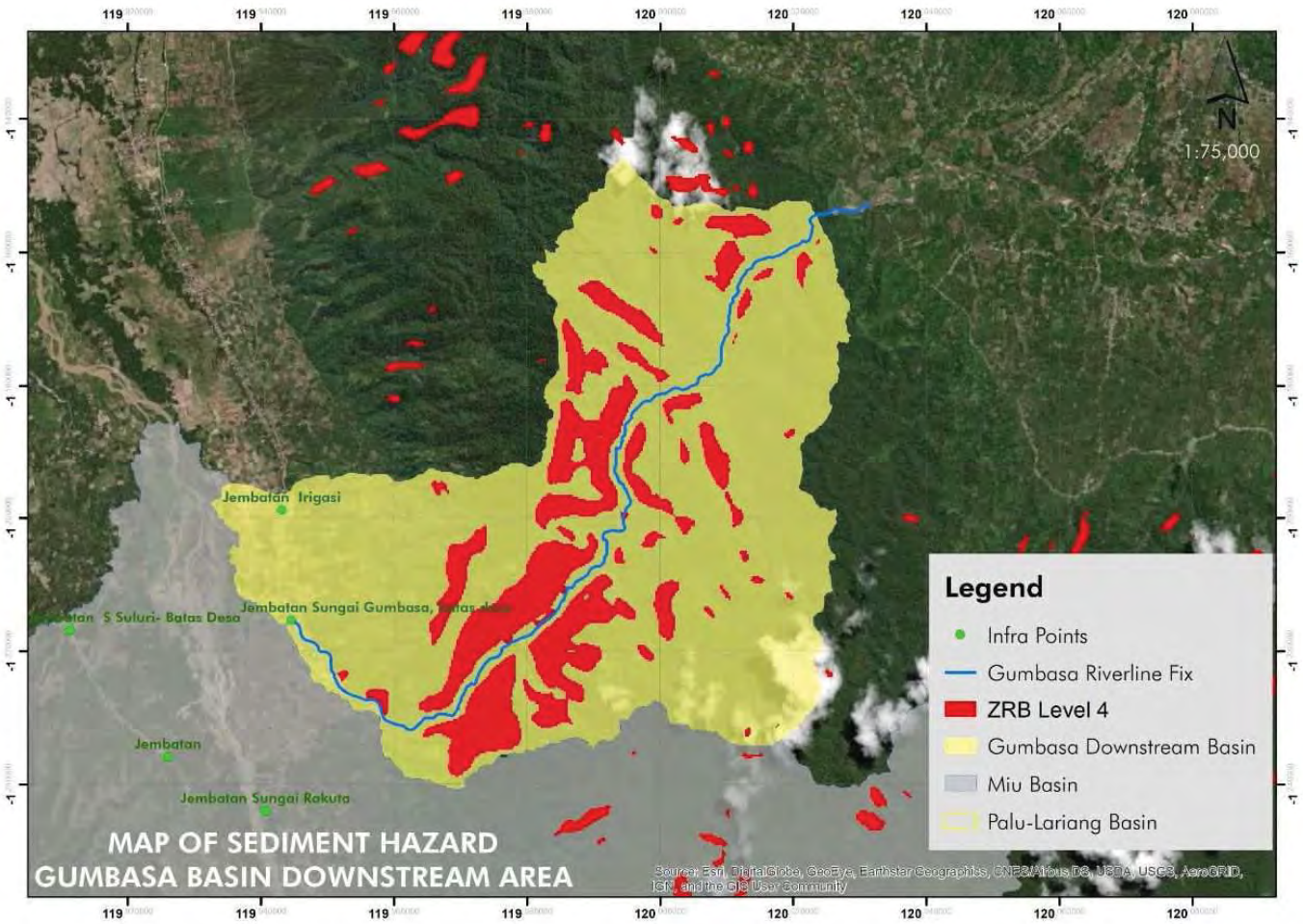
As for water resource development, it is necessary to develop a plan for water use, based on flood control.

Tabel 1: Kebutuhan Air Pada DAS Miu dan Gumbasa Tahun 2009 dan 2030

NAMA DAS	LUAS DAS (Ha)		Q Ketersediaan (Juta m3/th)	Q Kebutuhan Air (Juta m3/th)				Total Q Kebutuhan
				Irigasi	Peternakan	Perikanan	RT, Kota & Penggelontoran	
DAS Miu	69,503.25	Tahun 2009	538.12	66.88	0.23	0.12	3.41	70.63
		Tahun 2030	156.24	1.95	0.27	6.46	164.92	373.20
DAS Gumbasa	136,427.50	Tahun 2009	684.79	267.36	0.54	0.31	13.95	282.16
		Tahun 2030	427.66	4.02	0.60	26.67	458.95	225.83

STUDI POTENSI SUMBER DAYA AIR DALAM MENUNJANG POLA PENGGELOLAAN SUMBER DAYA AIR
(Studi Kasus DAS Miu dan Gumbasa)
Dian Noorvy[1], Kiki Frida Sulistyani[2]
Dosen Jurusan Teknik Sipil, Universitas Tribuana Tungga Dewi, Malang
Alumni S2 Teknik Sipil Universitas Brawijaya, Malang

Sediment control proposals in areas of major sediment sources



The JICA-TC project has shown vulnerable areas (high potential for slope failure) in mountainous areas. If this district were to experience a slope failure, a very large amount of sediment would be generated, which could cause significant damage downstream.

Sediment control proposals in areas of major sediment sources

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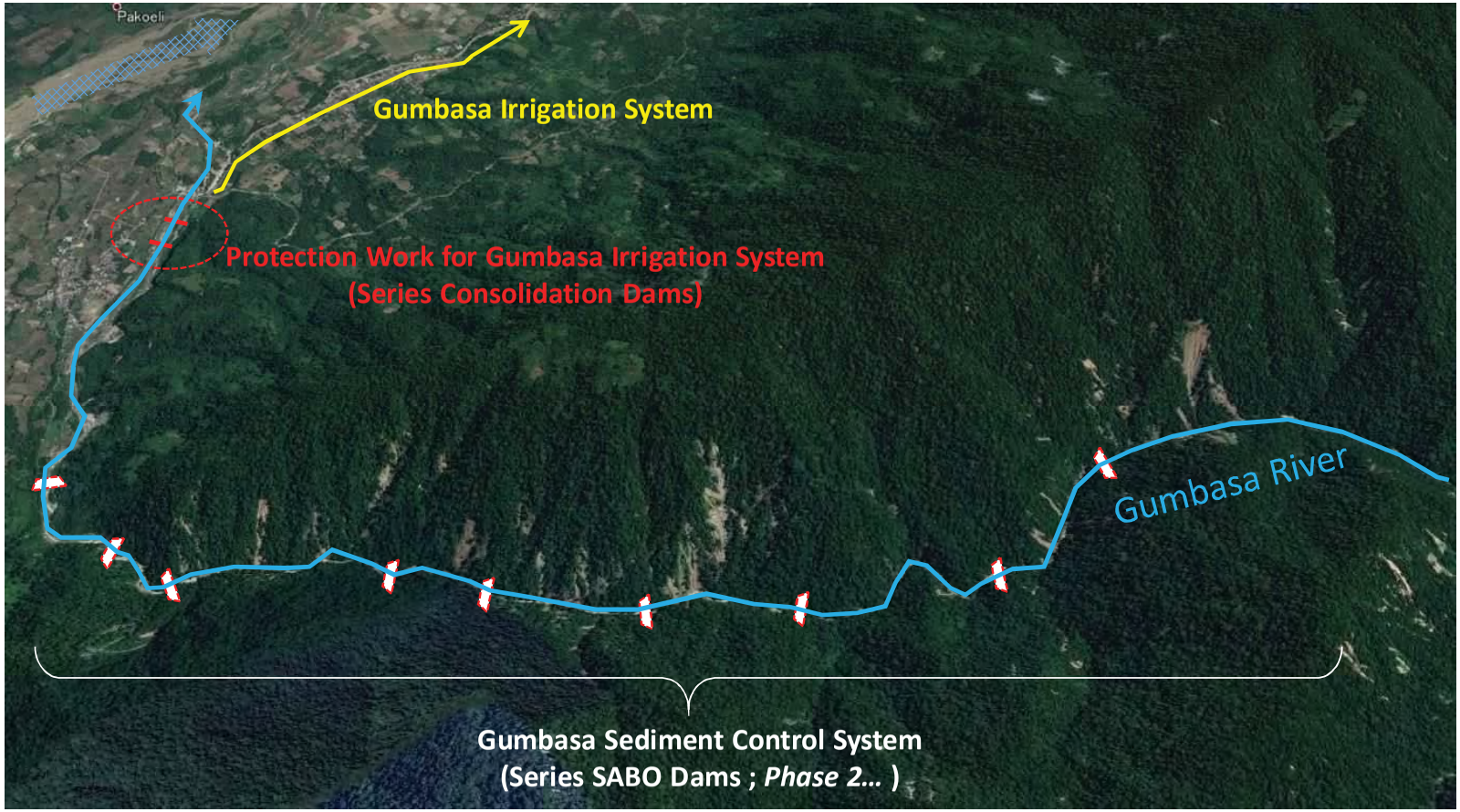


In line with the Master Plan, a SABO Master Plan for mountainous areas needs to be developed. The figure above is an example.

OTHER COMMENT

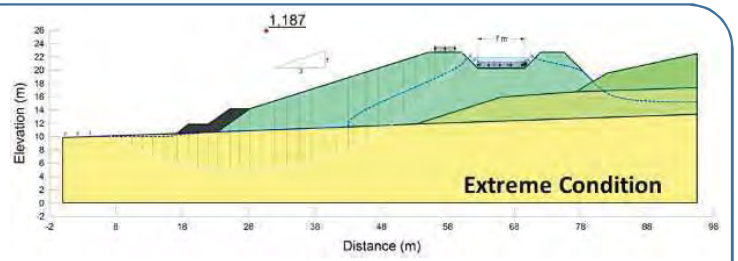
FOR D/D IRRIGATION SYSTEM

FOR

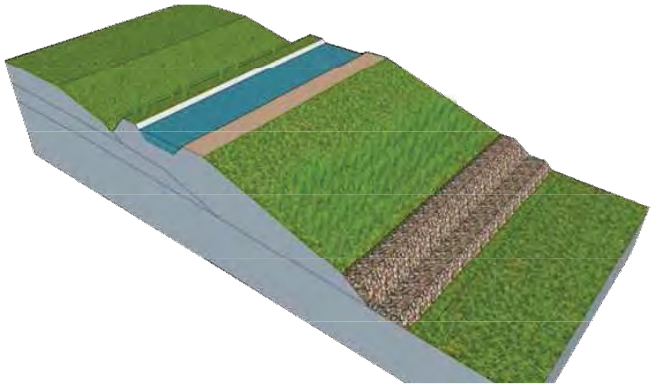
GUMBASA RIVER SEDIMENT CONTROL

YACHIYO Engineering

Target Discharge of Gumbasa river



No.	Slope Angle Variation	Global FS	Note
1.	Static condition	2,220	> 1,5
2.	Static + water level	2,074	> 1,5
3.	Seismic condition	1,377	> 1,1
4.	Extreme seismic + water level	1,187	> 1,1
	FS mininimum for seismic	1,1	



Source ; "Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province" Presentation material as on January 21,2021

Comments

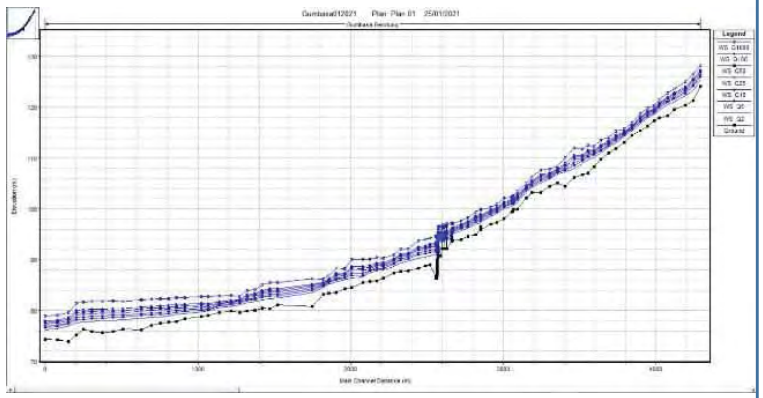
- It is evaluated as the most stable structure as a standard cross section of irrigation channel.
- Even if an unexpected earthquake or liquefaction occurs, the structure is tenacious against deformation and easy to repair.
- The geological structures of the Sibalaya and Jono Oge districts are different and require thorough geological surveys and modeling.
- It is necessary to reconfirm the scenario conditions when planning a scenario (calculation case) for stable examination. (assumed phenomenon)
- The embankment stability study (arc slip calculation) targets the foundation ground of the embankment, but isn't it necessary to study the stability of a larger area including the liquefaction area?
- For the embankment, it is necessary to use a material that is resistant to earthquakes and liquefaction.
- It is necessary to add drainage in the embankment, groundwater that may rise from the foundation ground, and drainage function that reduces groundwater pressure.

Target Discharge of Gumbasa river

GUMBASA WEIR PROFILE PLOT

ON HEC-RAS USING Q2, Q5, Q10, Q25, Q50, Q100, Q1000

Return Year	Q	Weir	Endsill	Outlet	Water Level (m)			Depth (m)		
	(m3/sec)	(m)	(m)	(m)	Weir	Endsill	Outlet	Weir	Endsill	Outlet
Q2	162.7	92.4	86.55	85.67	93.17	90.94	87.43	0.77	4.39	1.76
Q5	283.4	92.4	86.55	85.67	93.52	91.65	87.78	1.12	5.1	2.11
Q10	379.1	92.4	86.55	85.67	93.76	92.1	87.89	1.36	5.55	2.22
Q25	516.6	92.4	86.55	85.67	94.07	92.65	88.2	1.67	6.1	2.53
Q50	630.5	92.4	86.55	85.67	94.31	93.04	88.5	1.91	6.49	2.83
Q100	752.3	92.4	86.55	85.67	94.55	93.4	88.82	2.15	6.85	3.15
Q1000	1214.1	92.4	86.55	85.67	95.35	94.6	90.06	2.95	8.05	4.39



Source ; "Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province" Presentation material as on January 27,2021

Comments

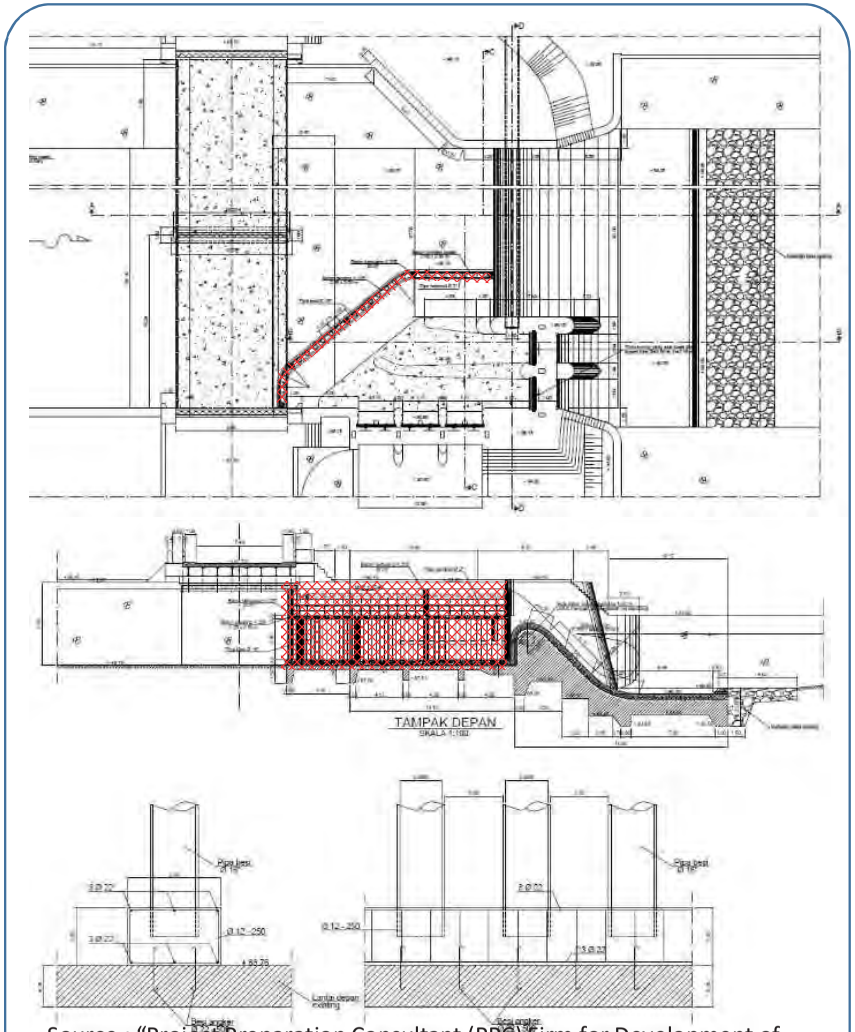
- Since it is necessary to match with the future Sediment Control Plan, I would like to confirm the basis for determining the flow rate.
- The normal river maintenance target uses a return period of 25 years. What is the year of establishment of the planned water intake of this irrigation facility?
- When formulating a plan to protect the intake facility from earth and stone, the target flow rate should be consistent with the sediment control plan. Generally, when planning sediment control, the return period is 100 years.
- When a large amount of earth and sand is mixed, the flow rate should be expected to increase by about 10% to 20%.

Recommendation

How about setting up a sediment control facility on the upstream side of the water intake facility to reduce the impact of debris flow and sediment flow on the water intake facility?

*However, it should be noted that sediment and gravel transported at normal flow rates cannot be captured by the sediment control facility on the upstream side.

Bolder Rack Structure



Source ; "Project Preparation Consultant (PPC) Firm for Development of the Gumbasa Irrigation System and its Facilities, Palu and Sigi Districts, Central Sulawesi Province" Presentation material as on January 27,2021

Comments

- Boulder rack can be evaluated as a very effective measure to protect the intake.
- In addition to earth and stone, many driftwoods flow down the Gumbasa River. For this reason, there is a high possibility that damage will be promoted if driftwood gets caught in the facility. This proposed structure can trap driftwood.

Matters of concern

① Is the facility strength sufficient when a debris flow collides? (Pile body, pile foundation)

② If the distance to the bridge on the upstream side is short and you trap earth and stone or driftwood, is the effect on the bridge considered?

Recommendation

A facility to capture earth and stone and driftwood will be installed on the upstream side of the bridge.
A sediment control facility on the upstream side will be planned, and megaliths and trees will be captured at the sediment control facility. (Matters to be discussed with BWS-SIII) The proposed facility plan does not need to be changed.

Liquefaction and groundwater fluctuations in the design of irrigation canals.

YACHIYO Engineering

On January 27, 2021, an ADB consultant asked how to consider liquefaction and groundwater fluctuations in the design.

The IRSL project is not proceeding with the normal design procedure because the irrigation canal restoration work is progressing.
Currently, the basic design of the irrigation canal facility has been completed, so the following procedures and ideas must be followed.

- Liquefaction countermeasures and groundwater control should be planned assuming the condition after the irrigation canal is restored.
- The amount and area of water supplied by irrigation canals is important for liquefaction control and groundwater control. In the ADB project, it is necessary to finalize this water allocation plan (master plan).
- Geological structure with possibility of liquefaction should be verified in the condition after the irrigation canal is completed.
- In examining the possibility of liquefaction, it is important to reflect the results analyzed by JICA-TC.
- Groundwater control determines a target value (how many meters underground should be maintained) so that it does not worsen than the groundwater condition assumed when the possibility of liquefaction was examined. Plan countermeasure facilities to reach this target value

The major points are as above.
The detailed analysis conditions and the use of JICA-TC's analysis results will be discussed between the ADB consultant and the JICA team (JICA-TA).

SEISMIC FORCE

FOR D/D IRRIGATION SYSTEM

FOR

GUMBASA RIVER SEDIMENT CONTROL

YACHIYO Engineering

Seismic Force

YACHIYO Engineering

- We received a document from the Gumbasa team on the concept of seismic force.
- The JICA team agrees on the method of calculating the seismic force and the standards and materials to be referenced.

Table 15: Proposed values of seismic coefficient used for different structures

Type of Structure	Seismic Coefficient	Comments
Weir	SLS Case – 0.22g (50-year Design Life) ULS case - 0.33 g (Based on Return period of SNI 1726:2019)	Irrigation Standard 2017, Kriteria Perencanaan (KP) – 06, Parameter Bangunan and USACE EM1110-2-2200 considered
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Earthwork Slopes	SLS -0.1125g ULS -0.225g	(Based on PuSGeN - Deterministic SHA for Palu-Koro Faults, Central Sulawesi
Canal Lining	SLS Case – 0.22g (50-year Design Life) ULS case - 0.33 g (Based on Return period of SNI 1726:2019)	USACE EM1110-2-2200 considered
Bridges	The seismic coefficient (Csm) can be calculated using equations in the Bridges code, which showed a relation to the structural period. This coefficient needs to be reduced by response modification factor (R), which are related to the type and importance of the structures.	SNI 2833:2016 (Bridges)
Buildings	Based on Building code recommendation	SNI 1726:2019

Information source; "Gumbasa Irrigation project – Seismic Design Criteria" from Gumbasa team ADB

Comments for Seismic Force

YACHIYO Engineering

For reconstruction projects in the area, structures must be designed in the spirit of the BBB.

1. Consideration needs to be given to seismic motion in 2018..
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3. Taking into account the importance of the structure

<Questions>

a. How to reflect the use of “SLS” and “ULS” in the design?
b. How do we distinguish between “Weirs” and “Irrigation Structures”?
c. What is “Embankment Slope” and does it apply to all embankment structures?
d. What is meant by seismic motion in the lining of a “Canal Lining”?

Question a ; "SLS" and "ULS"

YACHIYO Engineering

- SLS corresponds to "structural design by the allowable stress method" in the Japanese way of thinking, and is basically a method of designing so that deformation such as cracks does not occur in the material.
- On the other hand, ULS corresponds to the method of designing with the limit that the structure does not collapse even if the material is deformed.
- Although it depends on how the safety factor is considered, in general, the allowable stress method tends to make the structure safer (the required scale of the structure is larger) than the extreme design method.
- Please confirm the design method adopted by various Indonesian standards.

Question b ; How do we distinguish between "Weirs" and "Irrigation Structures"?

YACHIYO Engineering

- The intake weir, intake gate, operation tower, and waterway are integrated structures. It is necessary to determine the structural division between the weir and other structures.
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- Retaining walls, which are called earth pressure structures, are structures that are stabilized by their own weight against horizontal force, and small structures tend to require a larger structure cross section than necessary.

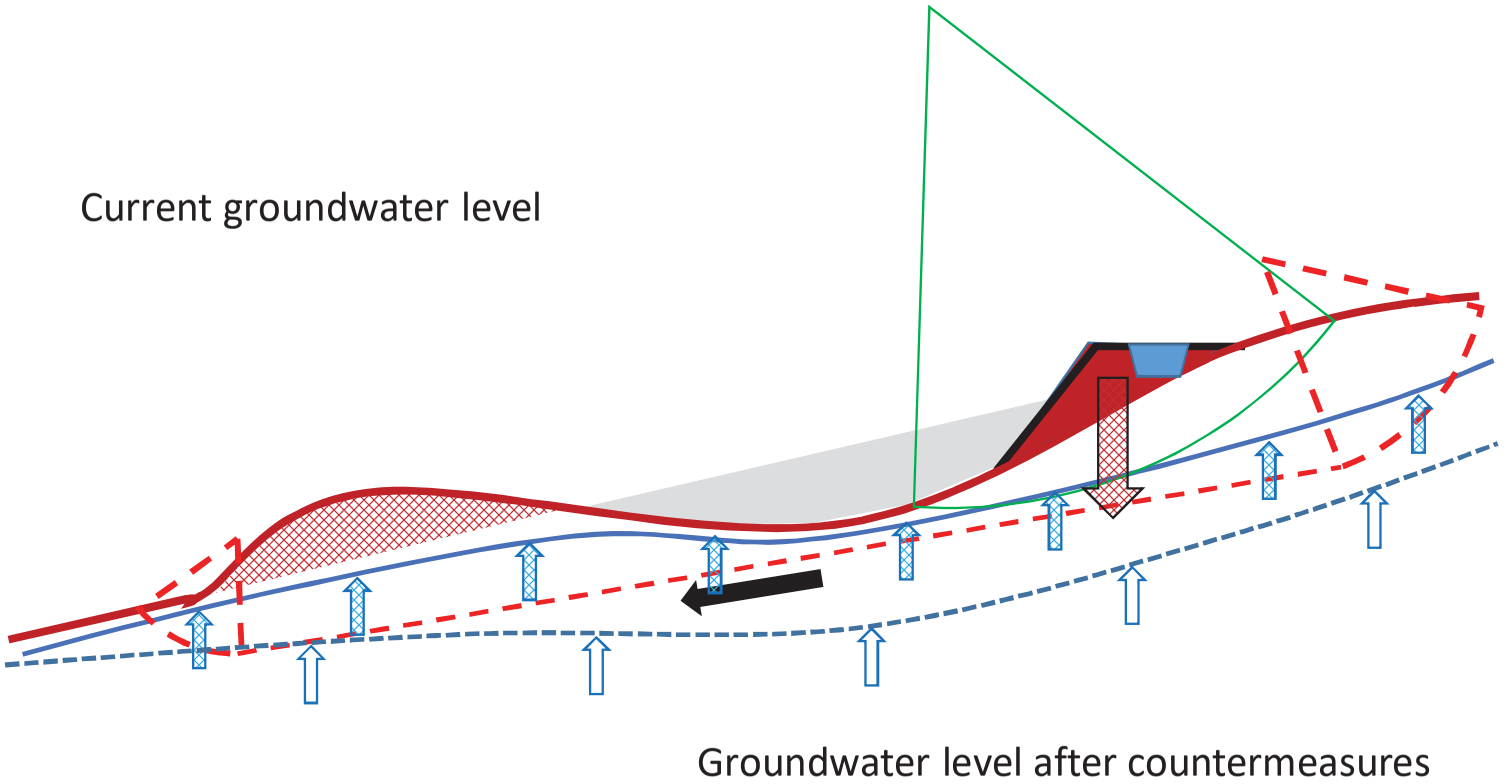
Question c ; "Embankment Slope" and does it apply to all embankment structures?

YACHIYO Engineering

In Japan, where there are many earthquakes, as in Indonesia, if the target embankment slope height is 15 m or more, seismic force should be considered when examining the stability of the embankment. The reason is that it is large and there are many important facilities. In addition, at a height of 15 m or less, there are many cases where no major collapse has occurred due to an earthquake, and seismic force is not counted for stability calculation.

In the Sibalaya and Jono Oge areas, the foundation of the irrigation facility will be an embankment structure. The scale of the embankment tends to increase, and if it is positioned as an important structure, the proposed SLS-0.1125g seems to be sufficient. However, there is no need for design in ULS.
In addition to the stability study of the embankment itself, it is necessary to study a large cross section including the liquefaction area.

YACHIYO Engineering



The validity of the arc-slip model needs to be verified.

NALODO & GROUND WATER

FOR D/D IRRIGATION SYSTEM

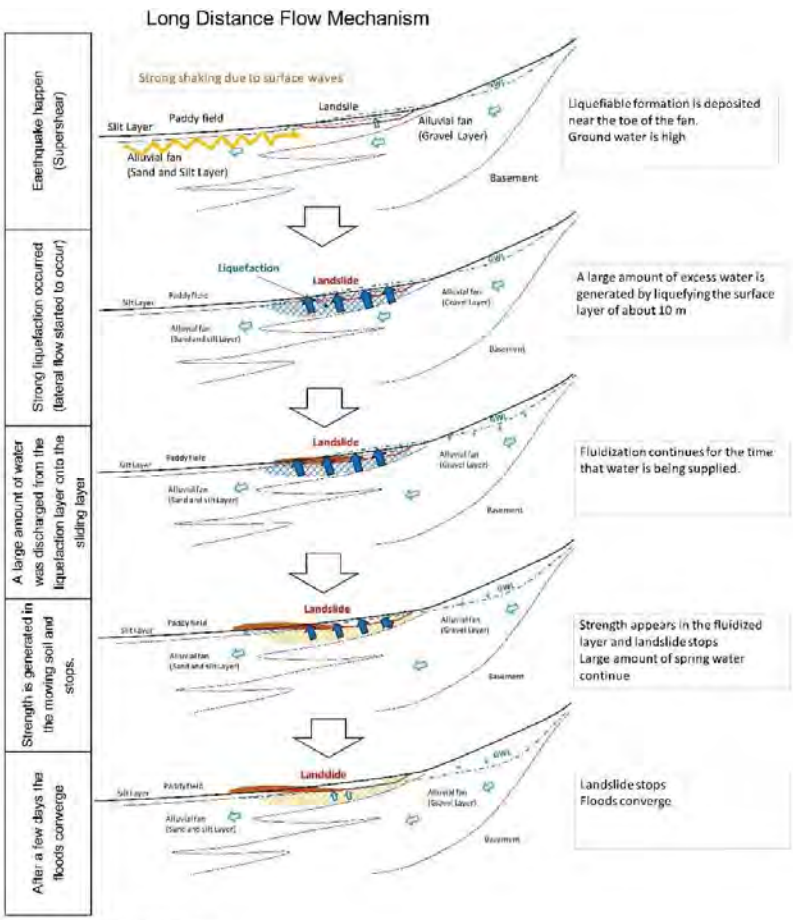
FOR

GUMBASA RIVER SEDIMENT CONTROL

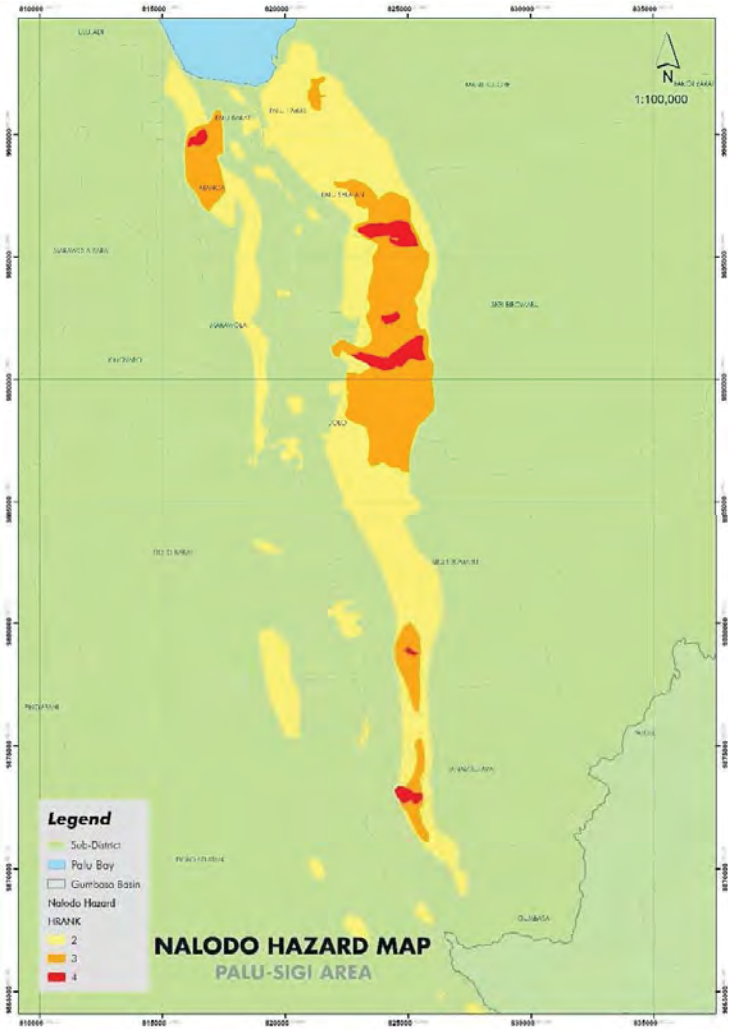
YACHIYO Engineering

Liquefaction and groundwater fluctuations in the design of irrigation canals.

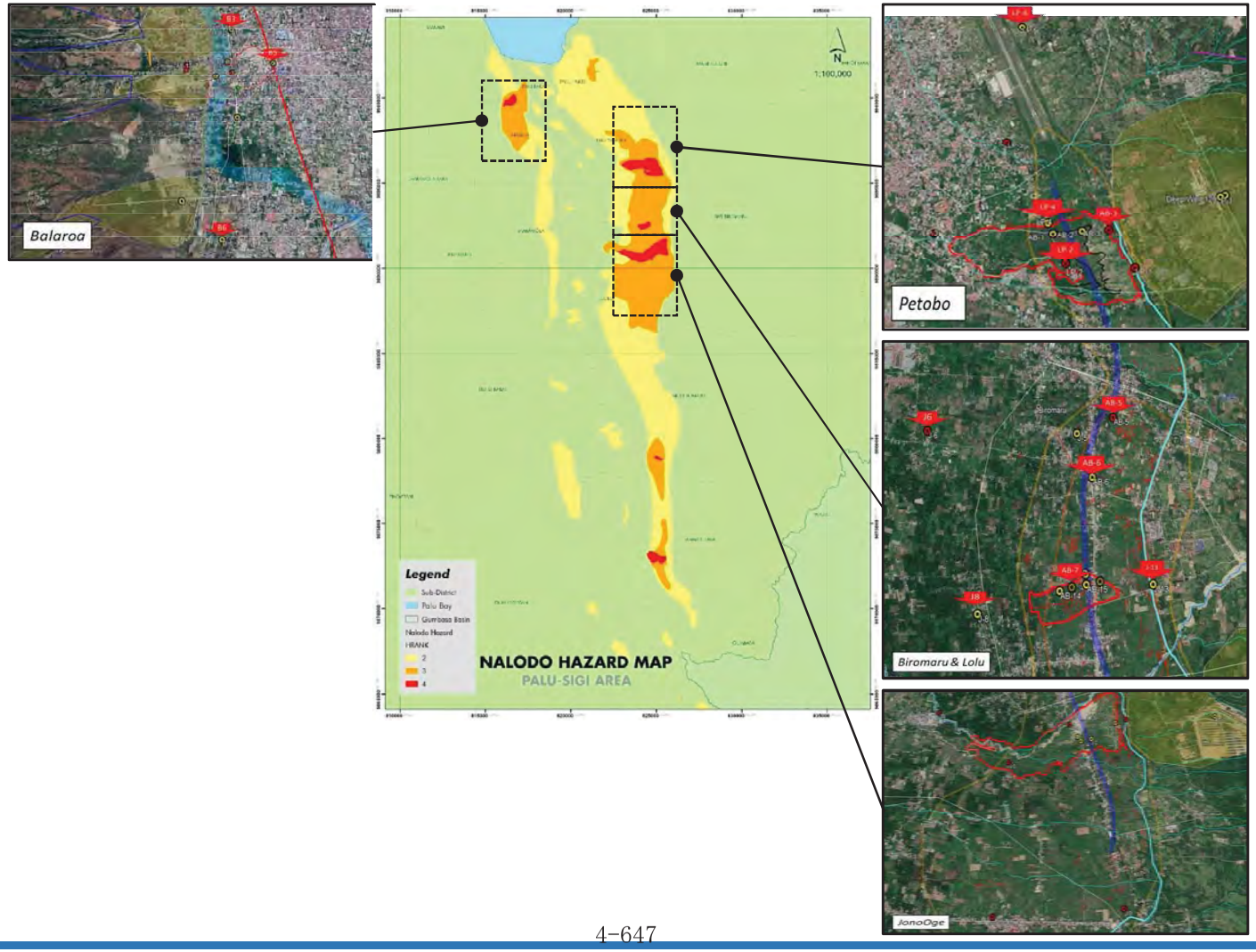
YACHIYO Engineering



Source: Prepared by JICA Experts

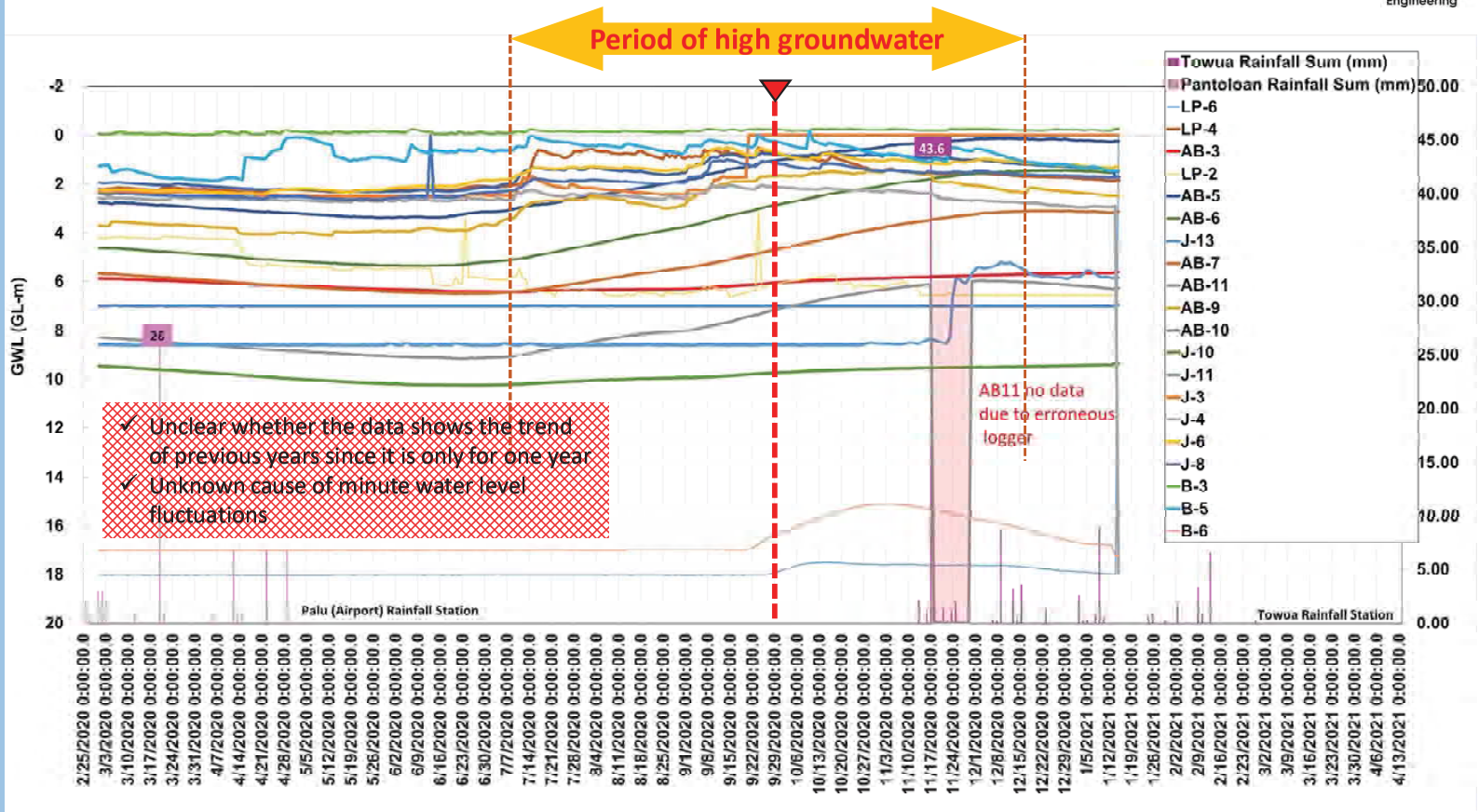


YACHIYO Engineering



Correlation between groundwater level and rainfall *(Analysis has not been completed!!)*

YACHIYO Engineering



If the fluctuations in groundwater are the same every year, the earthquake that occurred on September 28, 2018 coincides with the time when the groundwater is highest.

Yachiyo Engineering Co.,Ltd Jakarta Office

Liquefaction and groundwater fluctuations in the design of irrigation canals.

YACHIYO Engineering

The Nalod (liquefaction landslide) phenomenon should be well understood and the geological composition and groundwater level should be modeled.

- The validity of the arc-slip model needs to be verified.
  - Load due to embankment
  - Possibility of water leakage from open channels
  - Setting of groundwater level
  - Consideration of groundwater pressure
  - Extent of liquefaction and strength of ground

The Nalod phenomenon has not been fully understood, and there are many unknowns.

In the design of the Gumbasa irrigation channel, it is assumed that the Nalod phenomenon will be controlled by liquefaction countermeasures (reduction of groundwater level and groundwater pressure), which will be implemented separately.
However, this assumption should be discussed by many professional engineers and cannot be judged at the individual level.

YACHIYO
Engineering

Terima Kasih
ありがとうございます。

Yachiyo Engineering Co.,Ltd Jakarta Office

SEISMIC FORCE

FOR D/D IRRIGATION SYSTEM

FOR

GUMBASA RIVER SEDIMENT CONTROL

Seismic Force

- We received a document from the Gumbasa team on the concept of seismic force.
- The JICA team agrees on the method of calculating the seismic force and the standards and materials to be referenced.

Table 15: Proposed values of seismic coefficient used for different structures

Type of Structure	Seismic Coefficient	Comments
Weir	SLS Case – 0.22g (50-year Design Life) ULS case - 0.33 g (Based on Return period of SNI 1726:2019)	Irrigation Standard 2017, Kriteria Perencanaan (KP) – 06, Parameter Bangunan and USACE EM1110-2-2200 considered
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JICA-TAT Team

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JICA-TATEAM

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JICA-TATEAM

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JCA-TATEAM

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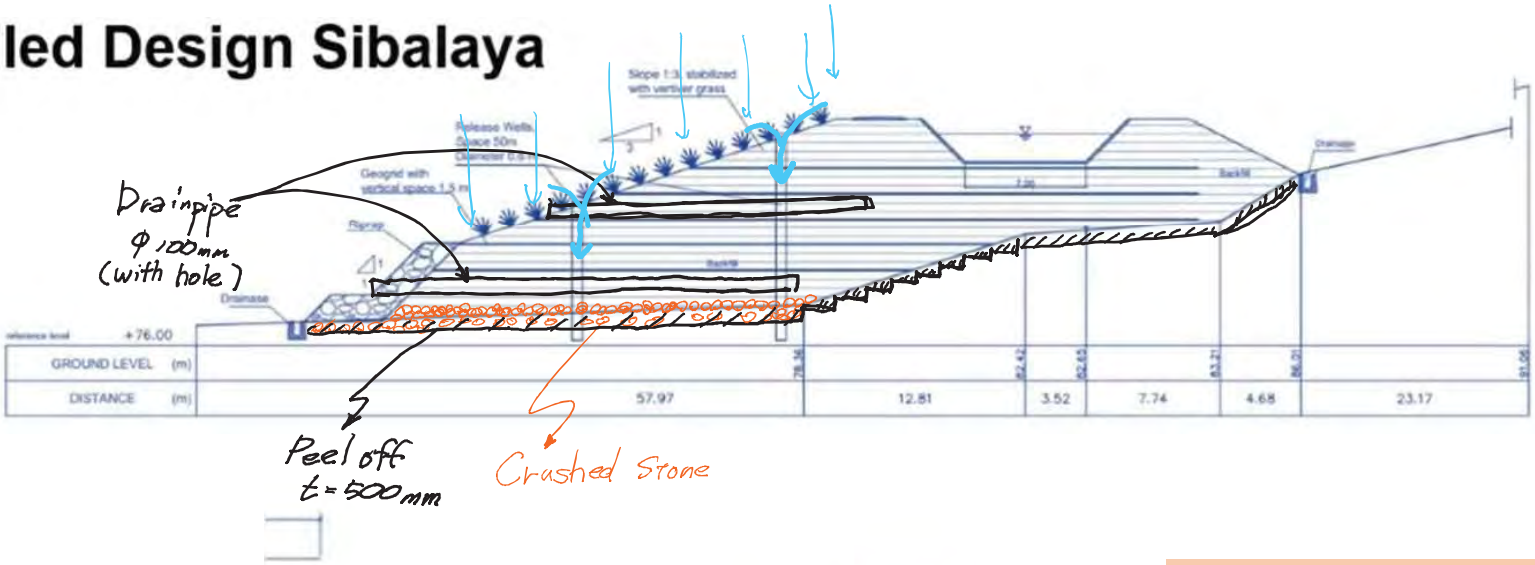
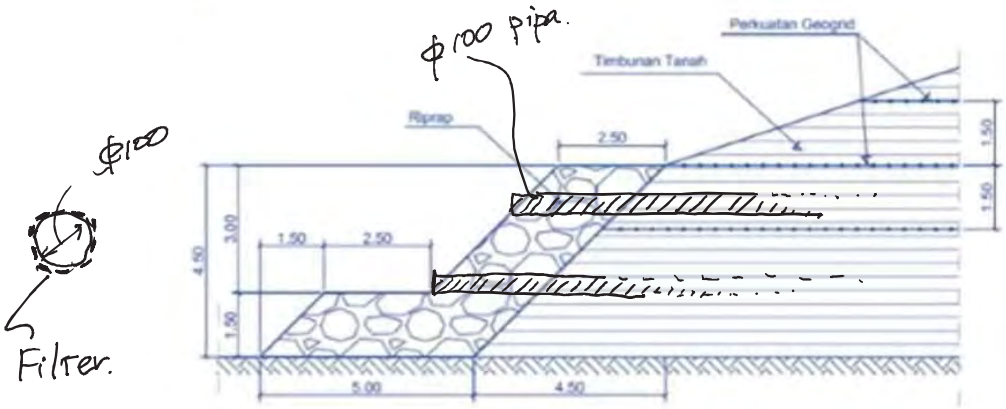
JCA-TATeam

ailed Design Sibalaya





DETAIL RIPRAP

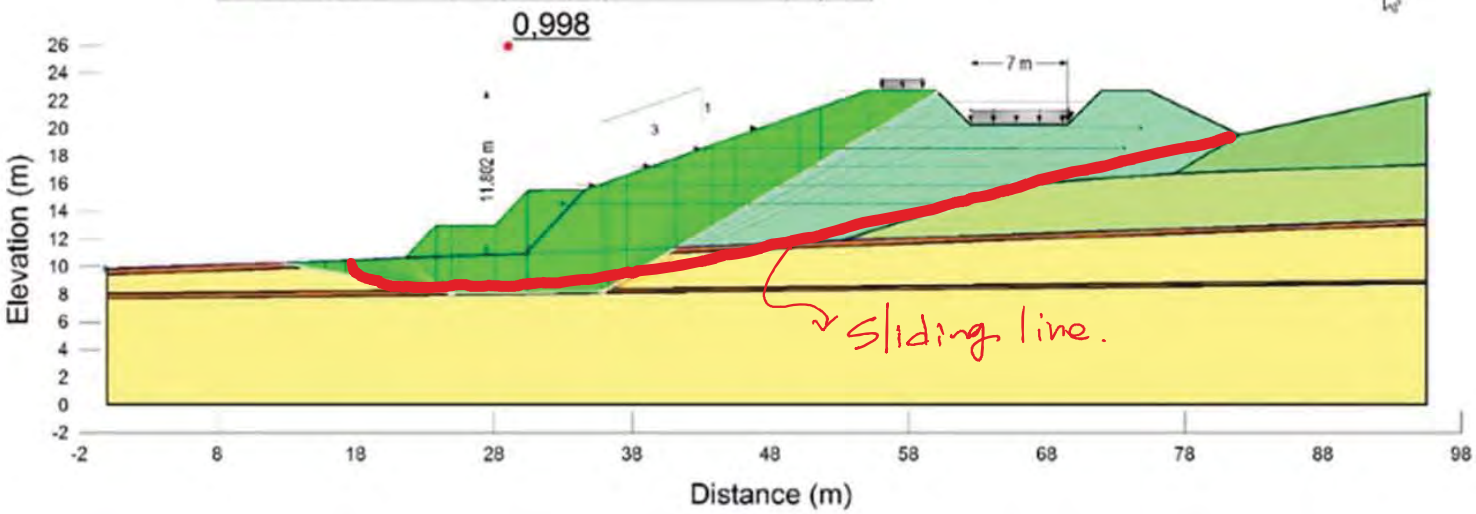
SKALA 1 : 50

Comments

- It is desirable to install the drain pipe with a hole type + filter horizontally.
- When making a new embankment, it is better to remove the topsoil in order to make it more familiar with the original ground.

JCA-TAT eam

Color	Name	Model	Unit Weight (kN/m³)	Cohesion' (kPa)	Phi' (°)	Phi-B (°)	Constant Unit Wt. Above Water Table (kN/m³)	Piezometric Line	Ru	Include Ru in PWP
	Backfill	Mohr-Coulomb	20.5	0	35	0	20.5		0.25	Yes
	Gravely Sand (very dense)	Mohr-Coulomb	20	0	35	0	20	1		No
	Riprap	Mohr-Coulomb	15	0	35	0	15			No
	Silt Sand	Mohr-Coulomb	19	0	29	0	18	1		No
	Silty Sand (Medium, Brown)	Mohr-Coulomb	20	0	32	0	20		0.25	Yes
	Silty Sand (Medium, Grey)	Mohr-Coulomb	20	0	30	0	20		0.25	Yes

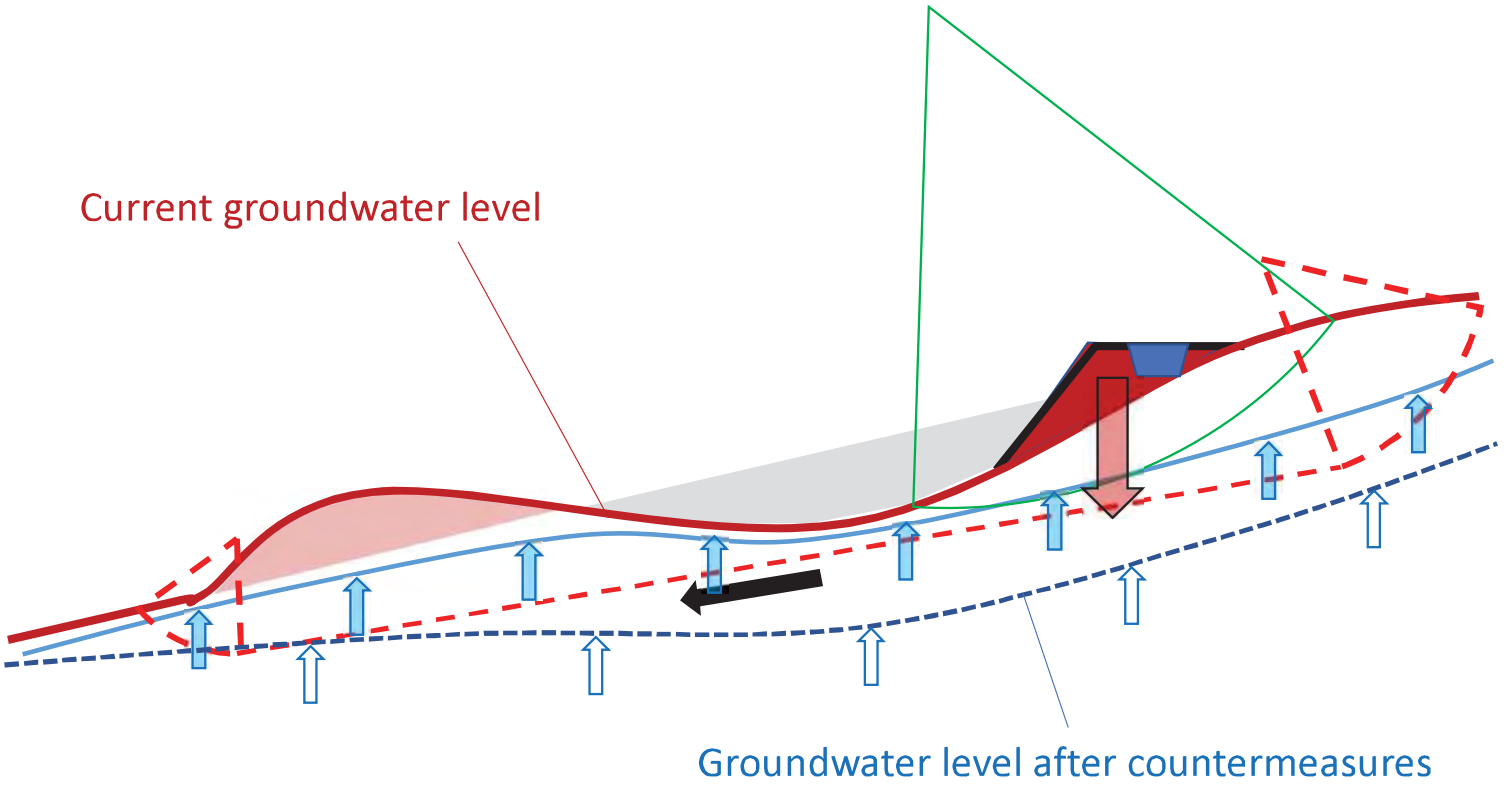


Comments

- Not only the stability of the slope, but also the stability of the original ground when a new embankment is placed should be considered.

JCA-TAT Team

An example of consideration



The validity of the arc-slip model needs to be verified.

JICA-TATEAM

Invitation Letter before Oct 2020

BADAN NASIONAL PENANGGULANGAN BENCANA

Gedung Graha BNPB Jalan Pramuka Kav. 38, Jakarta Timur 13120
Telepon: 021-2982 7766, Faksimile: 021-2128 1200
Situs: http://www.bnpb.go.id

Nomor : Und. 241/BNPB/SU/RR.01/02/2019 1 Februari 2019
Sifat : Segera
Lampiran : 3 (tiga) berkas
Hal : **Ralat Undangan Rapat Koordinasi**

Kepada Yth.
Daftar Terlampir
di -
Tempat

Menindaklanjuti undangan nomor Und. 130/BNPB/SU/RR.01/01/2019 Tanggal 28 Januari 2019 Perihal Identifikasi Sumber Pendanaan K/L dalam Rencana Rehabilitasi dan Rekonstruksi Sulteng, bersama ini kami sampaikan bahwa rapat yang **semula** diadakan pada:

Hari/Tanggal : Rabu/ 6 Februari 2019
Pukul : 08.00 WIB s/d selesai
Tempat : Gedung Graha BNPB Lantai 15
Jl. Pramuka Kav. 38, Jakarta Timur

diubah menjadi

Hari/Tanggal : Senin/ 4 Februari 2019
Pukul : 14.00 WIB s/d selesai
Tempat : Gedung Graha BNPB Lantai 15
Jl. Pramuka Kav. 38, Jakarta Timur

Konfirmasi kehadiran dan informasi lebih lanjut dapat menghubungi Sdri. Eusy (0818.02752708) dan Sdri. Christin (0813.28010470).

Demikian disampaikan, atas perhatian dan kehadirannya diucapkan terima kasih.

Sekretaris Utama,

Dody Ruswandi

Tembusan Yth.:
Kepala BNPB

Lampiran Undangan
Nomor : Und. 241/BNPB/SU/RR.01/02/2019
Tanggal : 1 Februari 2019

Daftar Undangan :

NO	INSTANSI
PEMERINTAH DAERAH SULAWESI TENGAH	
1.	Gubernur Sulawesi Tengah
2.	Sekretaris Daerah Provinsi Sulawesi Tengah
3.	Walikota Palu
4.	Bupati Donggala
5.	Bupati Sigi
6.	Bupati Parigi Moutong
KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT	
7.	Direktur Jenderal Cipta Karya, Kementerian Pekerjaan Umum dan Perumahan Rakyat
8.	Direktur Jenderal Bina Marga, Kementerian Pekerjaan Umum dan Perumahan Rakyat
9.	Direktur Jenderal Sumber Daya Air, Kementerian Pekerjaan Umum dan Perumahan Rakyat
10.	Direktur Jenderal Penyediaan Perumahan, Kementerian Pekerjaan Umum dan Perumahan Rakyat
11.	Direktur Jenderal Bina Konstruksi, Kementerian Pekerjaan Umum dan Perumahan Rakyat
12.	Direktur Jenderal Pembiayaan Perumahan, Kementerian Pekerjaan Umum dan Perumahan Rakyat
13.	Kepala Biro Perencanaan Kementerian Pekerjaan Umum dan Perumahan Rakyat
14.	Satgas PUPR Sulawesi Tengah
KEMENKO BIDANG POLITIK, HUKUM, DAN KEAMANAN	
15.	Kepala Biro Perencanaan, Kemenko Bidang Politik, Hukum dan Keamanan
KEMENKO BIDANG PEMBANGUNAN MANUSIA DAN KEBUDAYAAN	
16.	Deputi Bidang Koordinasi Kerawanan Sosial dan Dampak Bencana, Kemenko Bidang PMK
KEMENKO BIDANG PEREKONOMIAN	
17.	Kepala Biro Perencanaan, Kemenko Bidang Perekonomian
KEMENKO BIDANG KEMARITIMAN	
18.	Kepala Biro Perencanaan, Kemenko Bidang Kemaritiman
KEMENTERIAN DALAM NEGERI	
19.	Direktur Jenderal Bina Pembangunan Daerah Kementerian Dalam Negeri
20.	Kepala Biro Perencanaan, Kementerian Dalam Negeri
KEMENTERIAN LUAR NEGERI	
21.	Kepala Biro Perencanaan, Kementerian Luar Negeri
KEMENTERIAN AGAMA	
22.	Kepala Biro Perencanaan, Kementerian Agama
KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN	
23.	Kepala Biro Perencanaan, Kementerian Pendidikan dan Kebudayaan
47.	Direktur Jenderal Pendidikan Dasar dan Menengah, Kementerian Pendidikan dan Kebudayaan
KEMENTERIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI	
24.	Kepala Biro Perencanaan, Kementerian Riset, Teknologi dan Pendidikan Tinggi
KEMENTERIAN KESEHATAN	
25.	Direktur Jenderal Pelayanan Kesehatan, Kementerian Kesehatan
26.	Kepala Biro Perencanaan, Kementerian Kesehatan
KEMENTERIAN SOSIAL	
27.	Kepala Biro Perencanaan, Kementerian Sosial
28.	Direktur Perlindungan dan Jaminan Sosial Korban Bencana Alam, Kementerian Sosial

KEMENTERIAN ENERGI DAN SUMBER DAYA MINERAL	
29.	Kepala Biro Perencanaan, Kementerian Energi dan Sumber Daya Mineral
KEMENTERIAN PERHUBUNGAN	
30.	Kepala Biro Perencanaan, Kementerian Perhubungan
KEMENTERIAN KOMUNIKASI DAN INFORMATIKA	
31.	Kepala Biro Perencanaan, Kementerian Komunikasi dan Informatika
KEMENTERIAN PERTANIAN	
32.	Direktur Jenderal Prasarana dan Sarana Pertanian, Kementerian Pertanian
33.	Kepala Badan Ketahanan Pangan, Kementerian Pertanian
34.	Kepala Biro Perencanaan, Kementerian Pertanian
KEMENTERIAN KELAUTAN DAN PERIKANAN	
35.	Kepala Biro Perencanaan, Kementerian Kelautan dan Perikanan
KEMENTERIAN LINGKUNGAN HIDUP DAN KEHUTANAN	
36.	Kepala Biro Perencanaan, Kementerian Lingkungan Hidup dan Kehutanan
KEMENTERIAN DESA DAN PEMBANGUNAN DAERAH TERTINGGAL	
37.	Kepala Biro Perencanaan, Kementerian Desa Dan Pembangunan DaerahTertinggal
KEMENTERIAN PERENCANAAN PEMBANGUNAN NASIONAL/BAPPENAS	
38.	Deputi Bidang Pengembangan Regional, Kementerian PPN/BAPPENAS
KEMENTERIAN BUMN	
39.	Kepala Biro Perencanaan, Kementerian BUMN
KEMENTERIAN PARIWISATA	
40.	Kepala Biro Perencanaan, Kementerian Pariwisata
KEMENTERIAN KETENAGAKERJAAN	
41.	Kepala Biro Perencanaan, Kementerian Ketenagakerjaan
KEMENTERIAN PERINDUSTRIAN	
42.	Kepala Biro Perencanaan, Kementerian Perindustrian
KEMENTERIAN KOPERASI DAN USAHA KECIL DAN MENENGAH	
43.	Kepala Biro Perencanaan, Kementerian Koperasi dan Usaha Kecil dan Menengah
KEMENTERIAN PERDAGANGAN	
44.	Kepala Biro Perencanaan, Kementerian Perdagangan
KEMENTERIAN KEUANGAN	
45.	Direktur Jenderal Anggaran, Kementerian Keuangan
KEMENTERIAN AGRARIA DAN TATA RUANG/BPN	
46.	Kepala Biro Perencanaan, Kementerian Agraria dan Tata Ruang/BPN
KEMENTERIAN PEMBERDAYAAN PEREMPUAN DAN PERLINDUNGAN ANAK	
47.	Kepala Biro Perencanaan, Kementerian Pemberdayaan Perempuan dan Perlindungan Anak
KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN	
48.	Kepala Biro Perencanaan, Kementerian Pendidikan dan Kebudayaan
TENTARA NASIONAL INDONESIA	
KEPOLISIAN REPUBLIK INDONESIA	
49.	Asisten Kepala Kepolisian Republik Indonesia Bidang Perencanaan Umum dan Anggaran
KEJAKSAAN AGUNG REPUBLIK INDONESIA	
50.	Kepala Biro Perencanaan Kejaksaan Agung Republik Indonesia
BADAN NASIONAL PENANGGULANGAN BENCANA	
51.	Sekretaris Utama BNPB
52.	Inspektorat Utama BNPB
53.	Deputi Bidang Kesiapsiagaan BNPB
54.	Deputi Bidang Tanggap Darurat BNPB
55.	Deputi Bidang Rehabilitasi dan Rekonstruksi BNPB
56.	Deputi Bidang Logistik & Peralatan BNPB
57.	Plt Direktur Penilaian Kerusakan BNPB

58.	Direktur Pemulihan dan Peningkatan Fisik BNPB
59.	Direktur Pemulihan dan Peningkatan Sosial Ekonomi BNPB
60.	Kepala Biro Perencanaan BNPB
61.	Kepala Biro Keuangan BNPB
BADAN PERENCANAAN PEMBANGUNAN DAERAH SULAWESI TENGAH	
62.	Kepala BAPPEDA Provinsi Sulawesi Tengah
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LEMBAGA NON PEMERINTAH	
72.	UNDP
73.	ADB
74.	JICA

AGENDA TENTATIF
RAPAT KOORDINASI RENCANA REHABILITASI DAN REKONSTRUKSI PASCABENCANA GEMPABUMI, TSUNAMI, DAN LIKUIFAKSI PROVINSI SULTENG
SENIN, 4 FEBRUARI 2019

WAKTU			AGENDA ACARA	KETERANGAN
12.00	-	13.30	**Registrasi dan Makan Siang**	**Panitia**
13.30	-	14.00	**Peserta Memasuki Ruangan**	
			Pembukaan :	
14.00	-	14.05	- Menyanyikan Lagu Indonesia Raya	
14.05	-	14.15	- Laporan Deputi Bidang Rehabilitasi dan Rekonstruksi	
14.15	-	14.25	- Sambutan dan Pembukaan oleh Kepala BNPB	
14.25	-	14.30	- Pembacaan Doa	
14.30	-	15.15	**Pemaparan Rencana Rehabilitasi dan Rekonstruksi Pascabencana Prov Sulteng**	**Pemerintah Provinsi Sulawesi Tengah**
15.15	-	16.00	**Pemaparan Rekomendasi Zona Rawan Bencana**	**Kementerian BPN/ATR**
16.00	-	16.45	**Pemaparan Rencana Induk Penanggulangan Bencana**	**Kementerian Perencanaan Pembangunan Nasional/BAPPENAS**
16.45	-	17.15	**Pemaparan Kebijakan Anggaran**	**Dirjen Anggaran, Kementerian Keuangan**
17.15	-	17.45	**Diskusi Dan Tanya Jawab**	**Panitia**
17.45	-	19.00	**ISHOMA**	
19.00	-	Selesai	**Diskusi Kelompok Terfokus dibagi per wilayah kabupaten dan kota dalam rangka identifikasi pendanaan Kementerian/Lembaga**	**PIC Kota Palu, Kab Sigi, Kab Donggala, Kab Parigi Moutong**

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL BINA MARGA
DIREKTORAT PENGEMBANGAN JARINGAN JALAN
Jalan Pattimura No. 20, Kebayoran Baru, Jakarta 12110, Telepon (021) - 7200281, 7393928, Fax. (021) - 7201760

Nomor : UM.0102-Bp/0176
Sifat :
Lampiran :
Hal : Rapat Pembahasan Rencana Kegiatan Rekonstruksi Infrastruktur Pasca Bencana di Sulawesi Tengah

Jakarta, 14 Februari 2019

Kepada Yth.

(Daftar Terlampir)

di tempat

Sehubungan dengan rencana kegiatan **Rekonstruksi Infrastruktur Pasca Bencana di Sulawesi Tengah** yang akan dibiayai melalui pinjaman dan hibah luar negeri dari JICA, bersama ini kami mengundang Bapak/ Ibu untuk menghadiri rapat pembahasan kegiatan tersebut yang akan diselenggarakan pada,

Hari/ Tanggal	:	Senin/ 18 Februari 2019
Tempat	:	Balai Pelaksanaan Jalan Nasional XIV Palu Jl. MT Haryono No. 10, Palu, Sulawesi Tengah
Waktu	:	09.00 WITA
Agenda	:	Pembahasan Detail Pembangunan Tsunami *Dike*, Pembangunan Jembatan Palu IV, dan Penanganan Jalan Lingkungan Huntap

Demikian kami sampaikan, atas perhatian dan kehadirannya kami mengucapkan terima kasih.

Direktur Pengembangan Jaringan Jalan

Ir. Rachman Arief Dienaputra, M.Eng.
NIP. 19660627 199603 1 001

Tembusan Yth:
- Direktur Jenderal Bina Marga (sebagai laporan);

Lampiran 1 Surat No : UM.002-Bp/0176
Tanggal :

Daftar Undangan

1. Kepala Biro Perencanaan Anggaran dan Kerjasama Luar Negeri, Sekretariat Jenderal Kementerian PUPR
2. Direktur Preservasi Jalan
3. Direktur Jembatan
4. Ketua Satuan Tugas Pelaksana Penanggulangan Bencana Kementerian PUPR
5. Kepala Bappeda Kota Palu
6. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah
7. Kepala Dinas Pekerjaan Umum Kota Palu
8. Kepala Balai Pelaksanaan Jalan Nasional XIV Palu
9. Chief Representative JICA Indonesia Office

KEMENTERIAN AGRARIA DAN TATA RUANG/
BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kode Pos 12110
Telp.021-7264112 : www.atr-bpn.go.id

Nomor : 50/Und.200.13/III/2019 Jakarta, 1 Maret 2019
Lampiran : 1 (satu) berkas
Perihal : **Undangan Rapat Koordinasi Persiapan Revisi RTRW dan Penyusunan RDTR Provinsi/Kabupaten/Kota Terdampak Bencana di Provinsi Sulawesi Tengah**

Kepada Yth.
(Daftar undangan terlampir)
di
Tempat

Sehubungan dengan rencana pelaksanaan kegiatan Revisi Rencana Tata Ruang Wilayah (RTRW) dan Penyusunan Rencana Detail Tata Ruang (RDTR) untuk Provinsi/Kabupaten/Kota Terdampak Bencana di Provinsi Sulawesi Tengah, bersama ini kami mengundang Bapak/Ibu untuk hadir pada Rapat Koordinasi yang akan diselenggarakan pada:

Hari/Tanggal	:	Rabu, 6 Maret 2019
Waktu	:	09.00 WITA – Selesai
Tempat	:	Hotel Brizky Palu Jalan RE. Martadinata No.03, Tondo Mantikulore, Kota Palu

Mengingat pentingnya acara tersebut, kami mohon agar Bapak/Ibu dapat hadir tepat waktu. Sebagai informasi, biaya akomodasi dan transportasi ditanggung oleh instansi pengutus. Informasi lebih detail mengenai kegiatan ini dapat menghubungi Eky (No. HP: 081315735457) atau melalui email bimtek3taru@gmail.com.

Demikian kami sampaikan, atas perhatian dan kehadiran Bapak/Ibu, kami ucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah

Reny Windyawati,ST, M.Sc
NIP. 197111221997032001

Tembusan Kepada Yth:
- Direktur Jenderal Tata Ruang (sebagai laporan)

Lampiran Surat
Nomor :
Tanggal :
Perihal : Undangan Rapat Koordinasi Persiapan Penyusunan Revisi RTRW dan RDTR di Provinsi Sulawesi Tengah Berbasis Mitigasi Bencana

Daftar Undangan

Pemerintah Pusat

1. Direktur Tata Ruang dan Pertanahan, Kementerian PPN/Bappenas
2. Direktur Penataan Kawasan, Kementerian ATR/BPN
3. Kepala Kantor Wilayah Badan Pertanahan Nasional Provinsi Sulawesi Tengah, Kementerian ATR/BPN
4. Kepala Kantor Pertanahan Badan Pertanahan Nasional Kota Palu
5. Kepala Kantor Pertanahan Badan Pertanahan Nasional Kabupaten Sigi
6. Kepala Kantor Pertanahan Badan Pertanahan Nasional Kabupaten Donggala

Pemerintah Daerah

1. Kepala Badan Perencanaan Pembangunan Daerah Provinsi Sulawesi Tengah
2. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah
3. Kepala Badan Perencanaan Pembangunan Daerah Kota Palu
4. Kepala Dinas Penataan Ruang dan Pertanahan Kota Palu
5. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Donggala
6. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Donggala
7. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Sigi
8. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Sigi

Lembaga Pemerintah Jepang

1. JICA Team

Lampiran Surat
Nomor :
Tanggal :
Perihal : Undangan Rapat Koordinasi Persiapan Penyusunan Revisi RTRW dan RDTR di Provinsi Sulawesi Tengah Berbasis Mitigasi Bencana

JADWAL ACARA

Waktu (WITA)	Kegiatan	Keterangan
08.30 – 09.00	Registrasi peserta	
09.00 – 10.00	1. Pembukaan dan Arahan 2. Sambutan Pemerintah Provinsi Sulawesi Tengah	1. Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah 2. Kepala Dinas Bina Marga dan Tata Ruang Provinsi Sulawesi Tengah
10.00 – 11.00	Presentasi Output Kegiatan JICA : 1. Disaster Risk Assessment 2. Spatial Planning	JICA Team
11.00 – 12.00	Diskusi	
12. 00 – 12.15	Penutupan	Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL CIPTA KARYA
BALAI PRASARANA PERMUKIMAN WILAYAH SULAWESI TENGAH
SATUAN KERJA PELAKSANAAN PRASARANA PERMUKIMAN PROVINSI SULAWESI TENGAH
Jln. Soekarno-Hatta, No. 30 Palu. *E-mail : balaipraskim sulteng72@gmail.com*

Palu, 28 Maret 2019

Nomor : UM.02.06/BPPW-Sulteng/15
Lampiran : 1 (satu)
Perihal : Undangan Pemaparan Desain Gedung AMC RSAP

Kepada Yth.
(Daftar terlampir)
di -
Tempat

Sehubungan dengan Percepatan Rehabilitasi Konstruksi yang dilaksanakan oleh Kementerian Pekerjaan Umum dan Perumahan Rakyat dan menindak lanjuti Surat Pemberitahuan dari PT. INDRA KARYA (Persero) Divisi Engineering II, Kantor Palu selaku Konsultan Manajemen Konstruksi Pekerjaan Rehabilitasi RSU Anutapura Palu, Nomor : IKA.Palu/02/02/III/2019/KMK.RSAP tanggal 30 Maret 2019, yang mana memberitahu bahwa akan diadakan pertemuan untuk pemaparan Desain Gedung AMC (Anutapura Medical Center) RSU Anutapura Palu oleh PT. ADHI KARYA (Persero) Tbk dan Pihak Perencaan Desain tersebut.

Untuk itu kami mengundang Bapak/Ibu/sdr/(i) sekalian, pada :

Hari/Tanggal : Sabtu, 30 Maret 2019
Waktu : 09.00 – selesai
Tempat : Ruang VIP I RAJA KURING Restaurant
Jl. Hasanuddin No. 35 Palu

Demikian disampaikan atas perhatiannya diucapkan terimakasih.

Kepala Satuan Kerja Pelaksanaan Prasarana Permukiman Provinsi Sulawesi Tengah,

DR. AKSA H.MARDANI, S.T, M.M
NIP. 19730514 200112 1 003

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL CIPTA KARYA
BALAI PRASARANA PERMUKIMAN WILAYAH SULAWESI TENGAH
SATUAN KERJA PELAKSANAAN PRASARANA PERMUKIMAN PROVINSI SULAWESI TENGAH
Jln. Soekarno-Hatta, No. 30 Palu. E-mail : balaipraskim sulteng72@gmail.com

LAMPIRAN UNDANGAN

Lampiran Surat Nomor : UM. 02.06/BPPW/SATKER.PPP-Sulteng/15
Tanggal : 28 Maret 2019

Kepada Yth :

1. Ketua Komando Harian Satgaslak PB PUPR Sulteng di Palu;
2. Kepala BPPW Sulteng di Palu;
3. Direktorat Fasyankes, Ditjenyankes, Kementerian kesehatan di Jakarta;
4. Direksi RSU Anutapura Palu di Palu;
5. Dinas Pekerjaan Umum Kota Palu;
6. Dinas Kesehatan Kota Palu;
7. Perwakilan JICA Indonesia di Palu;

KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DIREKTORAT IRIGASI DAN RAWA
Jln. Pattimura 20, Kebayoran Baru, Jakarta Selatan 12110 Telp. : (021) 7394323, Fax. : (021) 7243633

Jakarta, 29 Maret 2019

Nomor : UM.0102-A1/70
Lampiran : 1 (satu) berkas
Hal : Pembahasan Draft TOR DED Rehabilitasi dan Rekonstruksi Jaringan Irigasi D.I Gumbasa BWS Sulawesi III
Sifat : Biasa

Kepada Yth.
(daftar terlampir)
di
Tempat

Sehubungan dengan akan dilaksanakannya Rehabilitasi dan Rekonstruksi Jaringan Irigasi D.I Gumbasa bersama ini dengan hormat kami mengundang Bapak/Ibu untuk hadir dalam pembahasan yang akan dilaksanakan pada:

Hari/Tanggal	:	Rabu / 10 April 2019
Waktu	:	10.00 – Selesai
Tempat	:	Ruang Rapat Direktorat Irigasi dan Rawa, Lantai 6, Gedung Direktorat Jenderal SDA Kementerian Pekerjaan Umum dan Perumahan Rakyat Jl. Pattimura No. 20 - Jakarta Selatan
Agenda	:	Pembahasan Draft TOR DED Rehabilitasi dan Rekonstruksi Jaringan Irigasi D.I Gumbasa
Catatan	:	**Dimohon agar masukan, kritik dan saran mengenai draft TOR DED dapat dikirimkan paling lambat 9 April 2019 kepada Subdit Bimbingan Teknik Irigasi dan Rawa melalui email bimtek.irwa2@gmail.com dan Whatsapp +6281294882536 (Aditya Rizki)**

Demikian disampaikan, atas perhatiannya kami ucapkan terima kasih.

Direktur Irigasi dan Rawa

Mochamad Mazid, ST, Sp.1
NIP. 19611226 198907 1001

Tembusan Yth. :

1. Kasubag Tata Usaha, Dit. Irigasi dan Rawa (penyedia ruangan)

LAMPIRAN – I : DAFTAR UNDANGAN

Nomor : UM-0102 – A1 /10
Tanggal : 29 Maret 2019
Hal : Pembahasan Draft TOR DED Rehabilitasi Jaringan Irigasi D.I Gumbasa BWS Sulawesi III

Kepada Yth. :

1. Kepala Pusat Pemetaan Rupabumi dan Toponim, Badan Informasi dan Geospasial;
2. Kepala Puslitbang Sumber Daya Air;
3. Kepala Bidang Gerakan Tanah, Bidang Mitigasi Gerakan Tanah Pusat Vulkanologi dan Mitigasi Bencana Geologi, Kementerian ESDM;
4. Kepala Bidang Air Tanah, Pusat Air Tanah dan Geologi Tata Lingkungan Badan Geologi, Kementerian ESDM;
5. Kepala Balai Wilayah Sungai Sulawesi III untuk menugaskan :
   1) Satker SNVT PJPA, Balai Wilayah Sungai Sulawesi III;
   2) Kepala Seksi Program dan Perencanaan, Balai Wilayah Sungai Sulawesi III;
   3) PPK Program dan Perencanaan, Balai Wilayah Sungai Sulawesi III;
   4) PPK Irigasi dan Rawa I, Balai Wilayah Sungai Sulawesi III;
6. Kepala Subdit Perencanaan Sumber Daya Air, Dit. PJSDA;
7. Kepala Subdit Keterpaduan Pemrograman, Dit. PJSDA;
8. Kepala Subdit Kerjasama, Dit. PJSDA;
9. Kepala Subdit Bimbingan Teknik, Dit. Irigasi dan Rawa, Ditjen SDA;
10. Kepala Subdit Perencanaan, Dit. Irigasi dan Rawa, Ditjen SDA;
11. Kepala Subdit Irigasi Wilayah Timur, Dit. Irigasi dan Rawa, Diten SDA;
12. Kepala Seksi Perencanaan Wil. Timur, Subdit Perencanaan, Dit. Irigasi dan Rawa;
13. Kepala Seksi Bimbingan Teknis Wilayah Timur, Subdit Bimtek, Dit. Irigasi dan Rawa;
14. Kepala Seksi Irigasi Wil. Timur I, Subdit Wil. Timur, Dit. Irigasi dan Rawa;
15. Kepala Seksi Irigasi Wil. Timur II, Subdit Wil. Timur, Dit. Irigasi dan Rawa;
16. Prof. Dr. Ir. Mahsyur Irsyam, MSE, Himpunan Ahli Teknik Tanah Indonesia (HATTI);
17. Tim Advis Teknis:
    - Ir. Eko Subekti, Dipl.HE (Ahli Irigasi)
    - Ir. Soekrasno, Dipl.HE (Ahli Irigasi)
    - Ir. Bistok Sigalingging, M.Sc (Ahli Geodetik)
    - Ir. Ferdinand Pakpahan, ME (Ahli Irigasi)
18. Tim Konsultan ADB
    - Mr. Eric Quincieu
    - Bpk. Andreas Ahas
    - Bpk. Setio Wasito
19. JICA Chief Representative
20. TA Expert JICA : Mr. Nakamura Akira

KEMENTERIAN AGRARIA DAN TATA RUANG/
BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kotak Pos 12110
Telp. 021 – 7264112 : www.bpn.go.id

Nomor : 90/und.200.13/IV/2019 Jakarta, 9 April 2019
Lampiran :
Hal : Undangan Pembahasan Progres Kegiatan JICA Terkait Pembuatan Peta Risiko Bencana dan Revisi RTRW di Provinsi Sulawesi Tengah

Yth.
Bapak/Ibu/Sdr. (Daftar undangan terlampir)
di
tempat

Sehubungan dengan kerjasama Kementerian ATR/BPN dengan JICA dalam revisi rencana tata ruang wilayah (RTRW) dan penyusunan RDTR di Provinsi Sulawesi Tengah, bersama ini kami mengundang Bapak/Ibu/Sdr untuk hadir pada rapat pembahasan progres untuk revisi RTRW dan penyusunan RDTR, yang akan dilaksanakan pada:

Hari/Tanggal : Kamis, 11 April 2019
Waktu : 13.00 WIB s.d selesai
Tempat : Ruang Rapat Bromo, Gedung Direktorat Jenderal Tata Ruang Lantai 4, Kementerian Agraria dan Tata Ruang/BPN

Mengingat pentingnya agenda tersebut, kami mohon agar Bapak/Ibu dapat hadir tepat waktu.

Demikian kami sampaikan atas perhatian dan kehadirannya, diucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang
dan Pemanfaatan Ruang Daerah

Reny Windyawati, ST., M.Sc
NIP. 197111221997032001

Tembusan:
- Direktur Jenderal Tata Ruang (sebagai laporan);

Lampiran I
Surat Nomor : 90/und.200.13/IV/2019
Tanggal : 9 April 2019

DAFTAR UNDANGAN

Kementerian PPN/ Bappenas :

1. Direktur Tata Ruang dan Pertanahan;

Kementerian Energi dan Sumber Daya Mineral :

2. Kepala Pusat Vulkanologi dan Mitigasi Bencana Geologi, Badan Geologi;
3. Kepala Pusat Air Tanah dan Geologi Tata Lingkungan, Badan Geologi;
4. Kepala Pusat Survei Geologi, Badan Geologi;

Badan Meteorologi dan Geofisika :

5. Kepala Pusat Seismologi Teknik Geofisika Potensial dan Tanda Waktu;

Badan Informasi Geospasial :

6. Kepala Pusat Pemetaan Rupa Bumi dan Toponimi;
7. Kepala Pusat Pemetaan Tata Ruang dan Atlas;

Badan Nasional Penanggulangan Bencana :

8. Direktur Kesiapsiagaan, Deputi Bidang Pencegahan dan Kesiapsiagaan
9. Direktur Pengurangan Risiko Bencana, Deputi Bidang Pencegahan dan Kesiapsiagaan
10. Kepala Pusat Data, Informasi dan Humas

Kementerian Agraria dan Tata Ruang/BPN :

11. Direktur Penataan Kawasan;
12. Kasubdit Pembinaan Wilayah I, Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfataan Ruang Daerah
13. Kasubdit Pembinaan Wilayah III, Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfataan Ruang Daerah;
14. Kasubdit Pembinaan Wilayah IV, Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfataan Ruang Daerah
15. Kasubdit Penataan Kawasan Baru, Direktorat Penataan Kawasan;

Mitra :

16. JICA Head Office Indonesia.

KEMENTERIAN PERENCANAAN PEMBANGUNAN NASIONAL/
BADAN PERENCANAAN PEMBANGUNAN NASIONAL
REPUBLIK INDONESIA

JALAN TAMAN SUROPATI NOMOR 2, JAKARTA 10310
TELEPON (021) 31936207, 3905650; FAKSIMILE (021) 3145374
www.bappenas.go.id

Nomor : 4124 /Dt.2.3/04/2019 Jakarta, 10 April 2019
Lampiran : 1 Berkas
Perihal : Permohonan Fasilitasi Diskusi dan Kunjungan Lapangan

Yth. Kepala Bappeda Provinsi Sulawesi Tengah
di –
Tempat

Menindaklanjuti pelaksanaan kerja sama antara Bappenas dengan JICA terkait hibah JICA "*Project for Development of Regional Disaster Risk Resilience Plan in Central Sulawesi*", Bappenas bersama JICA sedang menyusun *Memorandum of Understanding* (MoU) sebagai dasar pelaksanaan setiap kegiatan asistensi oleh JICA untuk mendukung rehabilitasi dan rekonstruksi pascabencana di Provinsi Sulawesi Tengah.

Mengingat keterlibatan Pemerintah Daerah sangat penting dalam proses rehabilitasi dan rekonstruksi, bersama ini kami bermaksud melakukan koordinasi dan pemantauan perkembangan koordinasi penyusunan MoU agar selaras dengan substansi tujuan pelaksanaan kegiatan yang tercantum dalam *Record of Discussion* (RoD) JICA dan Bappenas.

Sehubungan dengan hal tersebut, kami akan melakukan koordinasi dan kunjungan lapangan ke lokasi-lokasi intervensi hibah JICA dimaksud yang akan dilaksanakan pada hari **Senin-Selasa, 15-16 April 2019** dengan agenda rangkaian kegiatan sebagaimana terlampir.

Berkenaan dengan rencana dimaksud, kami mohon perkenan Saudara dapat memfasilitasi pelaksanaan agenda kegiatan dan staf kami Sdr. Arkha (081251001998) akan berkoordinasi dengan staf Saudara lebih lanjut.

Demikian kami sampaikan. Atas perhatian dan kerjasama Saudara kami ucapkan terimakasih.

Direktur Daerah Tertinggal, Transmigrasi, dan Perdesaan

Velix V. Wanggai

Tembusan Yth.

1. Deputi Bidang Pengembangan Regional – Kementerian PPN/Bappenas
2. Staf Ahli Menteri PPN Bidang Pemerataan dan Kewilayahan – Kementerian PPN/Bappenas (selaku Ketua Tim Pelaksana KAPP)

Lampiran Surat
Nomor : 4124 /Dt.2.3/04/2019
Tanggal : 10 April 2019

RINCIAN JADWAL AGENDA KOORDINASI & KUNJUNGAN LAPANGAN

Palu, 15-16 April 2019

No.	Waktu (WITA)	Agenda	Keterangan
Senin, 15 April 2019			
1.	13.30 – 15.30	Diskusi pembahasan dan masukkan terhadap rancangan *Memorandum of Understanding*	– Pembahasan MoU dilakukan oleh peserta undangan dari Bappenas bersama perwakilan Bappeda Provinsi. – Pembahasan MoU dilaksanakan paralel dengan kegiatan *workshop*.
Selasa, 16 April 2019			
2.	09.00 – 10.00	**Kunjungan Lapangan 1:** (1) Desa Loli Dondo (2) Desa Loli Tasiburi (3) Desa Loli Pesua (4) Desa Loli Saluran	Usulan lokasi hunian tetap baru berdasarkan Surat Gubernur Sulawesi Tengah Nomor 033/104/ Ro.Adwildapem tertanggal 28 Februari 2019 perihal Usulan Penambahan Lokasi Hunian Tetap
3.	10.00 – 11.30	**Kunjungan Lapangan 2** Output 4: (1) Pelatihan Pemulihan Mata Pencaharian Perempuan di Lokasi Pengungsian Balaroa (2) Lokasi Likuifaksi Balaroa Output 3	Lokasi intervensi hibah JICA

No.	Waktu (WITA)	Agenda	Keterangan
		(3) Penanganan dan pencegahan tsunami di sepanjang pantai Kota Palu (4) Jembatan Palu IV	
4.	11.30 – 13.00	Istirahat (Sholat & Makan Siang)	
5.	13.00 – 15.00	**Kunjungan Lapangan 3** (1) Lokasi Huntara (2) Lokasi Likuifaksi Petobo (3) Lokasi Huntap Petobo	Lokasi intervensi hibah JICA
6.	15.30 – selesai	Perjalangan Kembali ke Jakarta	

KEMENTERIAN AGRARIA DAN TATA RUANG/
BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kode Pos 12110
Telp.021-7264112 : www.atr-bpn.go.id

Nomor : 297/UND-200.9/IV/2019 Jakarta, 10 April 2019
Lampiran : 1 (satu) berkas
Perihal : **Undangan Rapat Koordinasi Revisi RTRW Kabupaten/Kota di Provinsi Sulawesi Tengah**

Kepada Yth.
(Daftar undangan terlampir)
di
Tempat

Sehubungan dengan pelaksanaan kerjasama Kementerian ATR/BPN dengan JICA dalam Revisi Rencana Tata Ruang Wilayah (RTRW) di Provinsi Sulawesi Tengah, serta dalam rangka dimulainya kegiatan Revisi RTRW Kota Palu, Revisi RTRW Kabupaten Sigi dan Revisi RTRW Kabupaten Donggala pada tahun anggaran 2019, bersama ini kami mengundang Bapak/Ibu untuk hadir pada Rapat Koordinasi yang akan diselenggarakan pada:

Hari/Tanggal : Senin, 15 April 2019
Waktu : 09.00 WITA – Selesai
Tempat : Jazz Hotel Palu
Jl. Zebra II No. 11, 94231 Palu

Mengingat pentingnya acara tersebut, kami mohon agar Bapak/Ibu dapat hadir tepat waktu. Sebagai informasi, biaya akomodasi dan transportasi ditanggung oleh instansi pengutus. Informasi lebih detail mengenai kegiatan ini dapat menghubungi Sabana (No. HP: 082280221509) atau melalui email bimtek3taru@gmail.com.

Demikian kami sampaikan, atas perhatian dan kehadiran Bapak/Ibu, kami ucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang dan
Pemanfaatan Ruang Daerah

Reny Windyawati,ST, M.Sc
NIP. 197111221997032001

Tembusan:
- Direktur Jenderal Tata Ruang (sebagai laporan)

Lampiran Surat
Nomor : 298 /UND - 200-13/ W /2019
Tanggal : 10 APRIL 2019
Perihal : Undangan Rapat Koordinasi Revisi RTRW Kabupaten/Kota di Provinsi Sulawesi Tengah

Daftar Undangan

Kementerian PPN/Bappenas :

1. Direktur Tata Ruang dan Pertanahan, Kementerian PPN/Bappenas

Kementerian Pekerjaan Umum dan Perumahan Rakyat :

2. Ketua Satgas Pelaksana Penanggulangan Bencana

Kementerian Energi dan Sumber Daya Mineral :

3. Kepala Pusat Vulkanologi dan Mitigasi Bencana Geologi, Badan Geologi
4. Kepala Pusat Air Tanah dan Geologi Tata Lingkungan, Badan Geologi
5. Kepala Pusat Survei Geologi, Badan Geologi

Badan Metereologi Klimatologi dan Geofisika :

6. Kepala Pusat Seismologi Teknik Geofisika Potensial dan Tanda Waktu

Badan Informasi Geospasial :

7. Kepala Pusat Pemataan Rupa Bumi dan Toponimi
8. Kepala Pusat Pemetaan Tata Ruang dan Atlas

Badan Nasional Penanggulangan Bencana :

9. Direktur Kesiapsiagaan, Deputi Bidang Pencegahan dan Kesiapsiagaan
10. Direktur Pengurangan Risiko Bencana, Deputi Bidang Pencegahan dan Kesiapsiagaan
11. Kepala Pusat Data, Informasi dan Humas

Kementerian Agraria dan Tata Ruang/BPN :

12. Direktur Penataan Kawasan
13. Kepala Kanwil BPN Provinsi Sulawesi Tengah
14. Kasubdit Pembinaan Wilayah I, Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah
15. Kasubdit Pembinaan Wilayah III, Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah
16. Kasubdit Pembinaan Wilayah IV, Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah
17. Kepala Kantah BPN Kota Palu
18. Kepala Kantah BPN Kabupaten Sigi
19. Kepala Kantah BPN Kabupaten Donggala

Pemerintah Provinsi Sulawesi Tengah :

20. Kepala Badan Perencanaan Pembangunan Daerah Provinsi Sulawesi Tengah
21. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah
22. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah
23. Kepala Dinas Perumahan, Kawasan Permukiman dan Pertanahan Provinsi Sulawesi Tengah
24. Kepala Dinas Perhubungan Provinsi Sulawesi Tengah

Pemerintah Kota Palu :

25. Kepala Badan Perencanaan Pembangunan Daerah Kota Palu
26. Kepala Dinas Penataan Ruang dan Pertanahan Kota Palu
27. Kepala Dinas Lingkungan Hidup Kota Palu
28. Kepala Dinas Pekerjaan Umum Kota Palu
29. Kepala Dinas Perumahan dan Kawasan Permukiman Kota Palu
30. Kepala Dinas Perhubungan Kota Palu
31. Kepala BPBD Kota Palu

Pemerintah Kabupaten Donggala :

32. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Donggala
33. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Donggala
34. Kepala Dinas Lingkungan Hidup Kabupaten Donggala
35. Kepala Dinas Perhubungan Kabupaten Donggala
36. Kepala Dinas Perumahan, Permukiman, dan Pertanahan Kabupaten Donggala
37. Kepala BPBD Kabupaten Donggala

Pemerintah Kabupaten Sigi:

38. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Sigi
39. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Sigi
40. Kepala Dinas Lingkungan Hidup Kabupaten Sigi
41. Kepala Dinas Perhubungan Kabupaten Sigi
42. Kepala BPBD Kabupaten Sigi

Mitra :

43. JICA Team
44. Tim Konsultan PT Barn Cita Laksana (Revisi RTRW Kabupaten Sigi)
45. Tim Konsultan PT Rekayasa Banguntama (Revisi RTRW Kabupaten Donggala)
46. Tim Konsultan PT Saranabudi Prakarsa (Revisi RTRW Kota Palu)

Lampiran Surat
Nomor : 208 /und-200-13 / IV /2019
Tanggal : 10 APRIL 2019.

JADWAL ACARA

No	Waktu (WITA)	Acara	Pembicara
1	08.30 - 09.00	Registrasi	
2	09.00 – 09.15	Arahan dan Pembukaan	Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah
3	09.15 – 09.45	Sambutan – sambutan	1. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah 2. Ketua Satgas Pelaksana Penanggulangan Bencana – Kementerian PUPR 3. JICA
4	09.45 – 10.30	Pemaparan *Hazard Maps*	JICA Study Team (Mr. Kitano)
5	10.30 – 12.00	Diskusi dan Tanya Jawab	
6	12.00 – 13.00	Ishoma	
7	13.00 – 13.45	Pemaparan Konsep Pengembangan Wilayah Palu dan sekitarnya	JICA Study Team (Mr. Sasaki)
8	13.45 – 14.30	Diskusi dan Tanya Jawab	
9	14.30 – 16.00	*Group Discussion* : 1. Kota Palu 2. Kabupaten Sigi 3. Kabupaten Donggala	
10	16.00 – 16.30	Penutupan	

BADAN NASIONAL PENANGGULANGAN BENCANA
DEPUTI BIDANG PENCEGAHAN DAN KESIAPSIAGAAN
Gedung Ina-DRTG Komplek IPSC Jl. Anyar, Desa Tangkil Sentul
Kec. Citeureup, Kab. Bogor, Jawa Barat 16810
Telepon: 021-29618776-77, Faksimile: 021-29618776

BNPB

Nomor : Und. 142 /BNPB/D1/PR/PK.01.03/05/2019 7 Mei 2019
Sifat : Segera
Lampiran : -
Hal : **Undangan Pembahasan Strategi Mitigasi Teluk Palu**

Yth. Bapak/Ibu
(Daftar terlampir)

Dalam rangka upaya Build Back Better and Safer pasca kejadian Gempa Bumi dan Tsunami Tahun 2018 di Sulawesi Tengah, diperlukan upaya pengurangan risiko bencana yang tepat. Untuk itu, BNPB bermaksud menyelenggarakan Pertemuan Pembahasan Strategi Mitigasi untuk Kawasan Teluk Palu. Sehubungan dengan hal tersebut, kami mengundang Bapak/Ibu untuk dapat hadir pada pertemuan tersebut yang akan dilaksanakan pada:

Hari/Tanggal	: Kamis, 09 Mei 2019
Pukul	: 11.00 s.d Selesai
Tempat	: Ruang Rapat Deputi 1 Lt. 14, Graha BNPB Jl. Pramuka Kav. 38, Jakarta Timur.
Agenda	: Pembahasan Strategi Mitigasi Teluk Palu

Untuk informasi lebih lanjut dan konfirmasi kehadiran Bapak/Ibu dapat menghubungi narahubung sdri. Karina (Hp: 0813-1782-1324). Demikian kami sampaikan, atas perhatian dan kerjasamanya kami ucapkan terima kasih.

Deputi Bidang Pencegahan dan Kesiapsiagaan

B. Wisnu Widjaja

Tembusan:
1. Kepala BNPB;
2. Sekretaris Utama BNPB.

Lampiran 1
Nomor : Und.142 /BNPB/D1/PR/PK.01.03/05/2019
Tanggal : 7 Mei 2019

Daftar Pejabat / Pegawai yang diundang :

1. Rahmat Triyono, ST, Dipl.Seis, M.Sc - Kepala Pusat Gempa Bumi dan Tsunami, BMKG
2. Direktur Pengurangan Risiko Bencana - BNPB
3. Direktur Tanggap Darurat – BNPB
4. Direktur Bantuan Darurat – BNPB
5. Direktur Perbaikan Darurat – BNPB
6. Direktur Penanganan Pengungsi – BNPB
7. Direktur Penilaian Kerusakan – BNPB
8. Direktur Pemulihan dan Peningkatan Fisik – BNPB
9. Direktur Pemulihan dan Peningkatan Sosial Ekonomi - BNPB
10. Kepala Biro Perencanaan – BNPB
11. Kepala Biro Hukum dan Kerjasama - BNPB
12. Dr. Abdul Muhari – KKP
13. Dr.-Ing Widjo Kongko, M.Eng - BPPT
14. Dr. Danny Hilman Natawidijaya - LIPI
15. Dr. Hamzah Latief – ITB
16. Dr. Gegar Prasetya - UGM
17. Perwakilan JICA
18. Kasubdit Mitigasi BNPB;
19. Kasi Mitigasi Struktur BNPB;
20. Kasi Mitigasi Non Struktur BNPB
21. Analis Dit. PRB BNPB;
22. Staff Direktorat PRB.

Deputi Bidang Pencegahan dan Kesiapsiagaan

BADAN NASIONAL PENANGGULANGAN BENCANA

B. Wisnu Widjaja

KEMENTERIAN AGRARIA DAN TATA RUANG/
BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kotak Pos 12110
Telp. 021-7396640 : www.atr-bpn.go.id

Nomor : 147/UND-200.13/V/2019 Jakarta, 10 Mei 2019
Lampiran : 1 (satu) berkas
Perihal : Ralat Undangan Pembahasan Metodologi Penyiapan Peta Risiko Bencana di Provinsi Sulawesi Tengah.

Kepada Yth,
Bapak/Ibu/Sdr. (daftar terlampir)
di
Tempat

Menindaklanjuti hasil pembahasan Progres Kegiatan JICA Terkait Pembuatan Peta Risiko Bencana dan Konsep Penataan Ruang Berbasis Pengurangan Risiko Bencana di Provinsi Sulawesi Tengah pada tanggal 10 Mei 2019, kami mengundang Bapak/Ibu/Sdr. untuk hadir pada rapat pembahasan metodologi penyiapan peta risiko bencana yang **semula** akan dilaksanakan pada :

Hari/Tanggal : Senin, 13 Mei 2019
Waktu : 09.00 WIB - selesai
Tempat : Ruang Rapat Toba, Gedung Direktorat Jenderal Tata Ruang Lantai 1, Kementerian Agraria dan Tata Ruang/BPN

Menjadi

Hari/Tanggal : Senin, 13 Mei 2019
Waktu : 13.30 WIB - selesai
Tempat : Ruang Rapat Toba, Gedung Direktorat Jenderal Tata Ruang Lantai 1, Kementerian Agraria dan Tata Ruang/BPN

Mengingat pentingnya agenda tersebut, kami mohon agar Bapak/Ibu dapat hadir tepat waktu. Demikian kami sampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang
dan Pemanfaatan Ruang Daerah

Reny Windyawati, ST., M.Sc.
NIP. 19711122 199703 2 001

Tembusan :
- Direktur Jenderal Tata Ruang (sebagai laporan)

Lampiran I
Surat Nomor :
Tanggal :

DAFTAR UNDANGAN

Kementerian Agraria dan Tata Ruang/BPN :

1. Yusmi Pranawati, ST, M.Sc
2. Jossi Erwindy, ST, MT
3. Dr. Agustomi Masik, M.Dev.Plg
4. Dra. Desfitriza, MT
5. Detty Theresia Putung, ST, MT
6. Budi Santosa, ST, MT
7. Mirwansyah Prawiranegara, ST, MSc
8. Mira Maryana Hidayanti, S.Ars., M.Sc
9. Yudha Perdana, ST, MT
10. Akasa Aji Dharma, SE, MM
11. Bambang Trihartanto Suroyo, ST, MT

Mitra :

12. JICA Head Office Indonesia
13. Widjonarko, ST, MT (Team Leader Kegiatan Revisi RTRW Kota Palu)
14. Deliana, ST, M.Si (Team Leader Kegiatan Revisi RTRW Kabupaten Sigi)
15. Andi Juandi Manaf, M.Si (Tenaga Ahli Hidrologi Penyusunan RDTR BWP I Kota Palu)
16. Akhmad Setiobudi (Team Leader Kegiatan Penyusunan RDTR Kabupaten Sigi)

KEMENTERIAN AGRARIA DAN TATA RUANG / BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kotak Pos 12110
Telp. 021 – 7264112 : www.bpn.go.id

Nomor : 155/UND-200.13/V/2019 Jakarta, 21 Mei 2019
Lampiran : -
Hal : Undangan Rapat Lanjutan Pembahasan Metodologi Penyiapan Peta Risiko Bencana di Provinsi Sulawesi Tengah

Yth.
Bapak/Ibu/Sdr. (Daftar undangan terlampir)
di
tempat

Menindaklanjuti hasil Rapat Pembahasan Metodologi Penyiapan Peta Risiko Bencana di Provinsi Sulawesi Tengah pada tanggal 13 Mei 2019, kami mengundang Bapak/Ibu/Sdr untuk hadir pada rapat lanjutan, yang akan dilaksanakan pada:

Hari/Tanggal : Rabu, 22 Mei 2019
Waktu : 13.00 WIB s.d selesai
Tempat : Ruang Rapat Mandalika, Gedung Direktorat Jenderal Tata Ruang Lantai 1, Kementerian Agraria dan Tata Ruang/BPN

Mengingat pentingnya agenda tersebut, kami mohon agar Bapak/Ibu dapat hadir tepat waktu.

Demikian kami sampaikan atas perhatian dan kehadirannya, diucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang
dan Pemanfaatan Ruang Daerah

Reny Windyawati, ST., M.Sc
NIP. 197111221997032001

Tembusan:
- Direktur Jenderal Tata Ruang (sebagai laporan);

Lampiran I
Surat Nomor :
Tanggal :

DAFTAR UNDANGAN

Kementerian PPN/ Bappenas :

1. Direktur Tata Ruang dan Pertanahan

Badan Nasional Penanggulangan Bencana :

2. Kasubdit Pencegahan, Direktorat Pengurangan Risiko Bencana
3. Kasubdit Mitigasi, Direktorat Pengurangan Risiko Bencana

Kementerian Agraria dan Tata Ruang/BPN :

4. Yusmi Pranawati, ST., M.Sc
5. Jossi Erwindy, ST., MT
6. Dr. Agustomi Masik, M.Dev.Plg
7. Dra. Desfitriza, MT
8. Detty Theresia Putung, ST., MT
9. Budi Santosa, ST., MT
10. Win Elas Yekti Marmono, SAP., M.Si
11. Firsta Ismet, ST., MUDD
12. Chriesty E. Lengkong, S.Si., M.Si., MEEM
13. Mirwansyah Prawiranegara, ST. M.Sc
14. Wikanti Ristya Dewi, ST., M.Sc
15. Maria Astrid Kuntjara, ST., M.Sc
16. Yohanes Fajar Setyo Wibowo, ST., MT
17. Mira Maryana Hidayanti, S.Ars., M.Sc
18. Yudha Perdana, ST., MT
19. Akasa Aji Dharma, SE., MM
20. Bambang Trihartanto Suroyo, ST., MT

Mitra :

21. JICA Head Office Indonesia;
22. Widjonarko, ST., MT (Team Leader Kegiatan Revisi RTRW Kota Palu)
23. Deliana, ST., M.Si (Team Leader Kegiatan Revisi RTRW Kabupaten Sigi)
24. Andi Juandi Manaf, M.Si (Tenaga Ahli Hidrologi Penyusunan RDTR BWP 1 Kota Palu
25. Akhmad Setiobudi (Team Leader Kegiatan Penyusunan RDTR Kabupaten Sigi)

PEMERINTAH PROVINSI SULAWESI TENGAH
DINAS BINA MARGA DAN PENATAAN RUANG
JL. Towua No. 85 Palu, Telp (0451) 483303 – 481540, Kode Pos 94114

Palu, 9 Juli 2019

Nomor : 005/532/BID.PR
Lampiran :
Perihal : **Undangan Konsultasi Publik II**

Kepada:
Yth. (Daftar Undangan terlampir)

Di –
Tempat

Dalam rangka pelaksanaan Kegiatan Penyusunan Revisi Rencana Tata Ruang Wilayah (RTRW) Provinsi Sulawesi Tengah Tahun 2018-2038, maka Bidang Penataan Ruang Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah akan melaksanakan Konsultasi Publik II yang akan dilaksanakan pada:

Hari/Tanggal : Selasa, 16 Juli 2019
Waktu : 09.00 WITA – Selesai
Tempat : Swiss Bell Hotel Palu,
Jalan Malonda No 12 Kel. Silae Kota Palu.
Agenda : (Jadwal Terlampir)

Demikian disampaikan atas kehadirannya diucapkan terima kasih.

KEPALA DINAS BINA MARGA
DAN PENATAAN RUANG
PROVINSI SULAWESI TENGAH,

DINAS BINA MARGA DAN PENATAAN RUANG

Ir. H. SYAIFULLAH DJAFAR, M.Si
Pembina Utama Madya
NIP. 19620715 199103 1 012

Tembusan disampaikan kepada Yth :
1. Gubernur Sulawesi Tengah (Sebagai laporan), di Palu;

Lampiran I

Nomor :
Tanggal :

Daftar Undangan

A. Instansi Pusat (Kementerian/Lembaga)

1. Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah Kementerian ATR/BPN;
2. Direktur Rencana, Penggunaan dan Pembentukan Wilayah Pengelolaan Hutan Kementerian Lingkungan Hidup dan Kehutanan;
3. Kepala Kantor Wilayah Badan Pertanahan Nasional Provinsi Sulawesi Tengah;
4. Kepala Balai Pemantapan Kawasan Hutan XVI Palu;'
5. Kepala Balai Wilayah Sungai Sulawesi III;
6. Kasubdit Pembinaan Wilayah III. Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah (Tim Konsultan Revisi RTRW Provinsi Sulawesi Tengah ATR/BPN)

B. OPD Provinsi terkait.

1. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah;
2. Kepala Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah;
3. Kepala UPTD TAHURA Provinsi Sulawesi Tengah;
4. Kepala Dinas Tanaman Pangan dan Hortikultura Provinsi Sulawesi Tengah;
5. Kepala Dinas Cipta Karya dan Sumber Daya Air Provinsi Sulawesi Tengah;
6. Kepala Dinas Perumahan, Kawasan Permukiman dan Pertanahan Provinsi Sulawesi Tengah;
7. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah; dan
8. Kepala Pelaksana Badan Penanggulangan Bencana Daerah Provinsi Sulawesi Tengah.

C. OPD Kabupaten/Kota.

1. Kepala Dinas Penataan Ruang dan Pertanahan Kota Palu;
2. Kepala Dinas Tanaman Pangan dan Hortikultura Kota Palu;
3. Kepala Dinas Pekerjaan Umum dan Perumahan Kabupaten Sigi;
4. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Sigi;
5. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Donggala;
6. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Donggala;
7. Kepala Dinas Pekerjaan Umum, Penataan Ruang dan Pertanahan Kabupaten Parigi Moutong;
8. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Parigi Moutong;
9. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Poso;
10. Kepala Dinas Pertanian Kabupaten Poso;

11. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Morowali;
12. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Morowali;
13. Kepala Dinas Pekerjaan Umum, Penataan Ruang, Perumahan dan Kawasan Permukiman Daerah Kabupaten Morowali Utara;
14. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Morowali Utara;
15. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Tojo Una-Una;
16. Kepala BP4D Kabupaten Tojo Una-Una;
17. Kepala Dinas Pertanian dan Ketahanan Pangan Kabupaten Tojo Una-Una;
18. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Banggai;
19. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Banggai;
20. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Banggai Kepulauan;
21. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Banggai Kepulauan;
22. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Banggai Laut;
23. Kepala BAPPEDA Kabupaten Banggai Laut;
24. Kepala Dinas Tanaman Pangan, Holtikultura, dan Perkebunan Kabupaten Banggai Laut;
25. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Tolitoli;
26. Kepala Dinas Tanaman Pangan dan Holtikultura Kabupaten Tolitoli;
27. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Buol; dan
28. Kepala Dinas Tanaman Pangan dan Holtikultura Kabupaten Buol.

D. LSM / Tokoh Masyarakat.

1. TEAM JICA;
2. WALHI Sulawesi Tengah;
3. Yayasan Merah Putih;
4. PT. CPM;
5. AMAN Sulawesi Tengah;
6. Yay Pendidikan Rakyat;
7. Yay Tanah Merdeka;
8. Simpul Layanan Pemetaan Partisipatif (SLPP) Sulawesi Tengah;
9. Komunitas Historia;
10. Ketua Dewan Adat Kota Palu;
11. Front Pemuda Kaili;
12. Oyom Sulawesi Tengah;
13. Yusak Pamei (Tokoh Masyarakat);
14. MHR Tampubolon (Akademisi – Peradilan Adat);
15. Rukmini Toheke (AMAN Sulawesi Tengah);

16. Daniel (Serikat Nelayan Teluk Palu);
17. Lahmudin Yoto (Aktifis LSM);
18. Ir. Natsir Abbas, M.Si (Forum Komunitas Kehutanan Masyarakat Sulawesi Tengah);
19. Tim KLHS Revisi RTRW Provinsi Sulawesi Tengah;
20. Lembaga Pemberdayaan Masyarakat (LPM) Poboya (Herman Pandejori);
21. LPM Tanamodindi (Syarif);
22. Ketua Pemuda Lasoani;
23. Ir. Abdul Wahid, M.Si (Fakultas Pertanian Untad Palu);
24. Dr. Ir. Aminuddin Laapo, M.Si (Fakultas Pertanian Untad);
25. Dr. Ir. H. Akhbar, MT (Fakultas Kehutanan Untad Palu); dan
26. Prof. Dr. Kaharuddin Kasim (PPLH Untad Palu).

Keterangan :

1. **Diharapkan 1 Instansi/Lembaga mengirimkan maksimal 1 orang peserta,**
2. **Untuk Peserta dari Kabupaten/Kota biaya Perjalanan Dinas ditanggung oleh masing-masing Instansi pengutus.**

Lampiran II

Nomor : 005/582/610-PR
Tanggal : 09 Juli 2019

SUSUNAN ACARA

No	Jam	Uraian
1.	09.00 – 09.30	Registrasi Peserta
2.	09.30 – 10.00	Sambutan Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah
3.	10.00 – 10.45	Pemaparan Substansi Revisi Raperda RTRW Provinsi Sulawesi Tengah
4.	10.45 – 11.45	Diskusi dan Tanya Jawab
5.	12.00	Penutupan Acara

KEMENTERIAN PERENCANAAN PEMBANGUNAN NASIONAL/
BADAN PERENCANAAN PEMBANGUNAN NASIONAL
REPUBLIK INDONESIA

JALAN TAMAN SUROPATI NOMOR 2, JAKARTA 10310
TELEPON (021) 31936207, 3905650; FAKSIMILE (021) 3145374
www.bappenas.go.id

Nomor : 8631 /Dt.2.3/07/2019 Jakarta, 18 Juli 2019
Lampiran : 2 (dua) berkas
Perihal : *Joint Coordinating Committee* (JCC) *Meeting* ke-2 Pembangunan Kembali Wilayah Pascabencana di Provinsi Sulawesi Tengah

Yth. (Daftar Terlampir)

di –
Tempat

Sehubungan dengan pelaksanaan pemulihan dan pembangunan kembali wilayah pascabencana di Provinsi Sulawesi Tengah, bersama ini kami bermaksud mengundang Saudarai/i untuk hadir pada *Joint Coordinating Committee* (JCC) *Meeting* ke-2 yang akan dilaksanakan pada:

Hari, tanggal	: Rabu, 31 Juli 2019
Waktu	: Pkl. 13.30 WIB – selesai
Tempat	: Ashley Hotel Jakarta Jl. KH. Wahid Hasyim, No. 73-75. Menteng, Jakarta Pusat 10340
Agenda	: Penyampaian perkembangan terkini pelaksanaan proyek pemulihan dan pembangunan kembali wilayah pascabencana di Provinsi Sulawesi Tengah oleh JICA
Pimpinan Rapat	: Deputi Bidang Pengembangan Regional

Mengingat pentingnya agenda rapat dimaksud, kehadiran dan partisipasi Saudara/i sangat kami harapkan. Untuk informasi lebih lanjut, staf Saudara/i dapat menghubungi staf kami Sdr. Raditya melalui email raditya.pranadi@bappenas.go.id atau nomor telepon 085695461085.

Atas perhatian dan kerjasama Saudara/i, kami ucapkan terima kasih.

Direktur Daerah Tertinggal, Transmigrasi, dan Perdesaan,

Velix. V. Wanggai

Tembusan Yth.
Deputi Bidang Pengembangan Regional – Kementerian PPN/Bappenas

Lampiran 1

Nomor : 8631 /Dt.2.3/07/2019
Tanggal : 18 Juli 2019

DAFTAR PESERTA UNDANGAN JCC MEETING KE-2

Kementerian PPN/Bappenas

1. Direktur Tata Ruang dan Pertanahan (selaku Ketua Pokja I Tim KAPP)
2. Direktur Pengairan dan Irigasi (selaku Ketua Pokja II Tim KAPP)
3. Direktur Pengembangan Usaha Kecil, Menengah, dan Koperasi (selaku Ketua Pokja III Tim KAPP)
4. Direktur Perencanaan dan Pengembangan Pendanaan Pembangunan (selaku Ketua Pokja IV Tim KAPP)
5. Direktur Otonomi Daerah (selaku Ketua Pokja V Tim KAPP)
6. Direktur Perkotaan, Perumahan, dan Permukiman
7. Direktur Lingkungan Hidup
8. Direktur Pendanaan Luar Negeri Bilateral
9. Kepala Biro Hukum
10. Kepala Biro Perencanaan, Organisasi, dan Tata Laksana
11. Kepala Subdirektorat Daerah Tertinggal dan Rawan Bencana
12. Ir. Hermani Wahab, M.Sc.
13. Andri NR. Mardiah, S.T., M.Bus., Ph.D.
14. Raditya Pranadi, S.Si.
15. Ir. Kuswiyanto, M.Si.
16. Arkha Dhemas Gunanda, S.Si.
17. Riza Amalia, S.Si.
18. Ricky Rosadi, S.T.

Kementerian Pekerjaan Umum dan Perumahan Rakyat (PUPR)

1. Direktur Pengembangan Jaringan Sumber Daya Air
2. Direktur Pengembangan Jaringan Jalan
3. Direktur Keterpaduan Infrastruktur Permukiman
4. Direktur Bina Penataan Bangunan
5. Kepala Biro Perencanaan Anggaran dan Kerjasama Luar Negeri
6. Ketua Satuan Tugas Penanggulangan Bencana Provinsi Sulawesi Tengah

Badan Nasional Penanggulangan Bencana (BNPB)

1. Direktur Pengurangan Risiko Bencana
2. Direktur Penilaian Kerusakan
3. Direktur Pemulihan dan Peningkatan Sosial Ekonomi
4. Direktur Pemulihan dan Peningkatan Fisik
5. Kepala Biro Perencanaan
6. Kepala Biro Hukum dan Kerjasama

Kementerian Agraria dan Tata Ruang/Badan Pertanahan Nasional (ATR/BPN)

1. Direktur Penataan Kawasan

2. Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah

Badan Meteorologi, Klimatologi, dan Geofisika (BMKG)

1. Kepala Pusat Gempa Bumi dan Tsunami
2. Kepala Pusat Seismologi Teknik Geofisika Potensial dan Tanda Waktu
3. Kepala Biro Perencanaan

Badan Informasi Geospasial (BIG)

1. Kepala Pusat Pemetaan Rupabumi dan Toponim
2. Kepala Biro Perencanaan, Kepegawaian dan Hukum

Kementerian Energi dan Sumber Daya Mineral

1. Kepala Pusat Vulkanologi dan Mitigasi Bencana Geologi – Badan Geologi
2. Kepala Pusat Air Tanah dan Geologi Tata Lingkungan – Badan Geologi
3. Kepala Pusat Survei Geologi – Badan Geologi

Kementerian Koperasi dan UKM

1. Asisten Deputi Bidang Perlindungan Usaha
2. Kepala Biro Perencanaan

Pemerintah Provinsi Sulawesi Tengah

1. Kepala Bappeda
2. Kepala Dinas Bina Marga & Penataan Ruang
3. Kepala Bidang Perencanaan Makro, Pengendalian, Monitoring, dan Evaluasi Bappeda Provinsi Sulawesi Tengah

Pemerintah Kota Palu

1. Kepala Bappeda
2. Kepala Dinas Penataan Ruang dan Pertanahan
3. Kepala Bidang Data & Informasi Bappeda Kota Palu

Pemerintah Kabupaten Sigi

1. Asisten II Bidang Ekonomi & Pembangunan Sekretariat Daerah
2. Kepala Bappelitbangda

Pemerintah Kabupaten Donggala

1. Kepala Bappeda
2. Kepala Dinas Pekerjaan Umum & Penataan Ruang

Pemerintah Kabupaten Parigi Moutong

1. Kepala Bappeda

Mitra Pembangunan

1. JICA Indonesia
2. JICA Study Team

Lampiran 2
Nomor : 8631 /Dt.2.3/07/2019
Tanggal : 18 Juli 2019

DAFTAR SUSUNAN AGENDA JCC MEETING KE-2

Waktu	Agenda
13.30 – 14.00	**Registrasi**
14.00 – 14.20	**Sesi Pembukaan** • Sambutan dan Pengantar: oleh: Deputi Bidang Pengembangan Regional Kementerian PPN/Bappenas • Sambutan dan Pengantar: oleh: JICA Indonesia
14.20 – 15.20	**Sesi Penyampaian Perkembangan Terkini** 1. Output 1 – Penilaian Risiko & Bahaya • Draf Peta Bahaya (Tsunami, Likuifaksi, Getaran Seismik, Bencana Sedimen, Banjir) • Manual referensi untuk merumuskan peta bahaya dan risiko • Diskusi panel oleh ahli bencana 2. Output 2 – Rencana Tata Ruang berbasis Risiko Bencana • Draf Laporan Konsep RTRW 3. Output 3 – Ketahanan Infrastruktur dan Fasilitas Publik • Target sektor untuk Proyek JICA • Outline target sub proyek • Outline/Desain rinci untuk rencana infrastruktur 4. Output 4 – Pemulihan Mata Pencaharian dan Komunitas • Outline dan perkembangan proyek percontohan (Palu, Sigi, Donggala)
15.20 – 16.20	**Diskusi dan Tanya Jawab**
16.20 – 17.00	**Sesi Penyampaian Laporan Kegiatan** • Program pelatihan (training) di Jepang oleh Bappenas • Diskusi panel ahli tsunami oleh Bappenas
17.00 – 17.30	**Penutupan** • Tanggapan simpulan (*Wrap-up comments*) oleh Bappeda • Acara perayaan peringatan Hari Jadi ke-1 kerja sama Indonesia-Jepang • Sambutan penutup oleh Bappenas

PEMERINTAH KOTA PALU

SEKRETARIAT DAERAH KOTA

JL.Balai Kota No. 1 Telp. (0451) 412344 – 421666 Telp. (0451) 411354

Palu, 19 Juli 2019

omor : 005/1552/ DPRD/2019
fat : Penting
amp : 1 (Satu) *exp.*
erihal : Undangan Konsultasi Publik Penyusunan KLHS RDTR Kota Palu

Kepada
Yth. (Daftar Undangan Terlampir)
di -
P a l u

Sehubungan dengan Pelaksanaan Kegiatan Penyusunan Rencana Det Tata Ruang (RDTR) Kota Palu Berbasis Mitigasi Bencana, Kementeri Agraria dan Tata Ruang / BPN RI Bekerjasama dengan Pemerintah Kota Pa akan melakukan **Konsultasi Publik** Penyusunan Kajian Lingkungan Hid Strategis (KLHS) RDTR dalam rangka Penjaringan Isu Pembangun Berkelanjutan yang akan dilaksanakan pada :

Hari/Tanggal	: Kamis, 25 Juli 2019
Waktu	: 08:00 WITA – Selesai
Tempat	: Swiss Bell Hotel Palu, Jalan Malonda No 12 Kel. Silae Kota Palu
Agenda	: (Jadwal Terlampir)

Demikian undangan ini disampaikan, atas kehadirannya diucapk terima kasih.

an. WALIKOTA PALU
SEKRETARIS DAERAH,

PEMERINTAH KOTA SETDA KOTA PALU

ASRI, S.H.
PEMBINA UTAMA MADYA (IV /d)

4-699

aftar Undangan

. **Pemerintah Pusat**

1. Direktur Penataan Kawasan, Ditjen Tata Ruang Kementerian Agraria dan Ta Ruang/Badan Pertanahan Nasional;
2. Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah, Ditje Tata Ruang, Kementerian Agraria dan Tata Ruang/Badan Pertanahan Nasional;
3. Kepala Kantor Wilayah ATR/BPN Provinsi Sulawesi Tengah, Kementerian Agraria da Tata Ruang/Badan Pertanahan Nasional;
4. Kepala Kantor Pertanahan ATR/BPN Kota Palu, Kementerian Agraria dan Ta Ruang/Badan Pertanahan Nasional;
5. Kepala Balai Sarana dan Prasarana Permukiman Wilayah Sulawesi Tenga Kementerian Pekerjaan Umum dan Perumahan Rakyat
6. Kepala Balai Pelaksanaan Jalan Nasional XIV Palu, Kementerian Pekerjaan Umu dan Perumahan Rakyat;
7. Kepala Balai Wilayah Sungai Sulawesi III, Kementerian Pekerjaan Umum da Perumahan Rakyat;
8. Kepala Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung Palu Pos Kementerian Lingkungan Hidup dan Kehutanan;
9. Kepala Balai Konservasi Sumber Daya Alam Sulawesi Tengah, Kementeria Lingkungan Hidup dan Kehutanan;
10. Kasubdit Penataan Kawasan Baru, Direktorat Penataan Kawasan, Kementeria Agraria dan Tata Ruang/Badan Pertanahan Nasional;
11. Kasubdit Penataan Kawasan Perkotaan, Direktorat Penataan Kawasan, Kementeria Agraria dan Tata Ruang/ Badan Pertanahan Nasional;
12. Kasubdit Penataan Kawasan Perdesaan, Direktorat Penataan Kawasan, Kementeria Agraria dan Tata Ruang/Badan Pertanahan Nasional;
13. Kasubdit Penataan Kawasan Ekonomi, Direktorat Penataan Kawasan, Kementerian Agraria dan Tata Ruang/ Badan Pertanahan Nasional.

. **Pemerintah Provinsi Sulawesi Tengah**

1. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah;
2. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah;
3. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah.

. **Pemerintah Kota Palu**

1. Sekretaris Daerah Kota Palu;
2. Ketua Komisi C DPRD Kota Palu;
3. Kepala Badan Perencanaan Pembangunan Daerah Kota Palu;
4. Kepala Dinas Pekerjaan Umum Kota Palu;
5. Kepala Dinas Perumahan dan Kawasan Permukiman Kota Palu;
6. Kepala Dinas Pertanian dan Ketahanan Pangan Kota Palu;
7. Kepala Dinas Sosial Kota Palu;
8. Kepala Pelaksana Badan Penanggulangan Bencana Daerah Kota Palu;
9. Kepala Badan Pusat Statistik Kota Palu;

13. Camat Mantikulore;
14. Camat Palu Barat;
15. Camat Palu Selatan;
16. Camat Palu Timur;
17. Camat Palu Utara;
18. Camat Tatanga;
19. Camat Tawaeli;
20. Camat Ulujadi;
21. Tim Ahli Bangunan Gedung (TABG) Kota Palu.

. **TNI/Polri**

1. Kapolres Kota Palu
2. Komandan Kodim 1306/Donggala

. **Pokja Kajian Lingkungan Hidup Strategis (KLHS)**

1. Kepala Dinas Penataan Ruang dan Pertanahan Kota Palu;
2. Kepala Dinas Lingkungan Hidup Kota Palu;
3. Sekretaris Dinas Pariwisata Kota Palu;
4. Kepala Bidang Perencanaan dan Pemanfaatan Ruang, Dinas Penataan Ruang da Pertanahan Kota Palu;
5. Kepala Bidang Pengendalian Ruang Dinas Penataan Ruang dan Pertanahan Ko Palu;
6. Kepala Bidang Tata dan Penataan Lingkungan Dinas Lingkungan Hidup Kota Palu;
7. Kepala Bidang Kawasan Permukiman Dinas Perumahan dan Kawasan Permukima Kota Palu;
8. Kepala Bidang Perencanaan BAPPEDA Kota Palu;
9. Kepala Bidang Data dan Informasi BAPPEDA kota Palu;
10. Kepala Bidang Sumber Daya Air dan Cipta Karya Dinas Pekerjaan Umum Kota Palu;
11. Kepala Bidang Pencegahan dan Kesiapsiagaan Badan Penanggulangan Bencar Daerah Kota palu
12. Kepala Bidang Pencegahan dan Penindakan Dinas Pemadam Kebakaran da Penyelamatan;
13. Kepala Seksi Monitoring dan Evaluasi Tata Ruang Dinas Penataan Ruang da Pertanahan Kota Palu;
14. Kepala Seksi Pemanfaatan Ruang Dinas Penataan Ruang dan Pertanahan Kota Palu
15. Kepala Seksi Inventarisasi Perencanaan dan Kajian Lingkungan Dinas Lingkunga Hidup Daerah Kota Palu;
16. Kepala Seksi Pembinaan Bangunan dan Lingkungan Dinas Penataan Ruang da Pertanahan Kota Palu;
17. Kepala Seksi Lingkungan Perhubungan Dinas Perhubungan Kota Palu;
18. Seksi Infrastruktur dan Tata Kelola E-Government Dinas Komunikasi dan Informatik Kota Palu;
19. Kepala Seksi Perencanaan Persampahan Dinas Lingkungan Hidup Daerah Kota Palu
20. Kepala Seksi Kesehatan Lingkungan, Kesehatan Kerja dan Olahraga Dinas Kesehata

1. Ketua Lembaga Penelitian Universitas Tadulako Palu;
2. Ketua Lembaga Penelitian Universitas Muhammadiyah Palu;
3. Ketua Lembaga Penelitian Universitas Alkhairaat Palu;
4. Ketua Lembaga Penelitian Institut Agama Islam Negeri (IAIN) Palu.

5. Media Masa

1. Lembaga Penyiaran TVRI Palu
2. RRI Palu

I. Lembaga Swadaya Masyarakat/Lembaga Lainnya

1. UNDP;
2. JICA;
3. Wahana Visi Indonesia;
4. Yayasan Budha Tzuchi;
5. Ikatan Ahli Perencanaan (IAP) Komisariat Sulawesi Tengah;
6. Ketua Forum Komunikasi LPM Kota Palu;
7. Ketua Forum Komunikasi BKM Kota Palu;
8. Ketua Koordinator Kota Forum Kota Tanpa Kumuh (Kotaku);
9. Kelompok Masyarakat Petani Garam;
10. Komunitas Galigasa;
11. Komunitas Mombine Galigasa;
12. WALHI;
13. Komunitas Nemubuku;
14. Komunitas Historia;
15. Organisasi Masyarakat Jatam;
16. Forum Balaroa;
17. Forum Huntara Petobo;
18. Yayasan Merah Putih;
19. Serikat NelayanTeluk Palu;
20. Asosiasi Pedagang Kaki Lima;
21. Asosiasi Pertambangan (ASPETA) Sulawesi Tengah

Swasta

1. Ketua DPD REI Sulawesi Tengah;
2. Ketua Persatuan Hotel dan Restoran Indonesia (PHRI) Sulawesi Tenga
3. Perusahaan Air Minum Swasta;
4. Direktur PT. Bangun Palu Sulawesai Tengah (BUPP KEK Palu);
5. Pimpinan Citra Land Palu;
6. Direktur PT Srihapan Palu City Square;
7. PimpinanTransmart (Carefour) Palu;

1. Tim Konsultan PT. Saranabudi Prakarsaripta Cabang Palu (Penyusunan Revisi RTRW Kota Palu);
2. Tim Konsultan PT. Tigacakra Gemakarya (Penyusunan RDTR Kota Palu BWP I);
3. Tim Konsultan PT. Prospera Consulting Engineers (Penyusunan RDTR Kota Palu BWP II);
4. Tim Konsultan PT. Inasa Sakha Kirana (Penyusunan RDTR Kota Palu BWP III);

Susunan Acara

Konsultasi Publik KLHS RDTR Kota Palu Berbasis Mitigasi Bencana
Palu, 25 Juli 2019

Waktu	Kegiatan	Keterangan
8.00 – 08.30	Registrasi Peserta, pembagian form panduan dan lembar kerja	
8.30 – 08.45	Sambutan dan Pembukaan Pemerintah Kota Palu	Sekretaris Daerah Kota Palu
8.45 – 09.00	Arahan Direktur Penataan Kawasan	Direktur Penataan Kawasa Ditjen Tata Ruang Kementeria Agraria dan Tata Ruang/Bada Pertanahan Nasional
esi 1: Penjaringan Isu Pembangunan Berkelanjutan		
9.00 – 09.30	Penyampaian Isu Pembangunan Berkelanjutan di Kota Palu.	**Moderator:** Kepala Dinas Lingkungan Hidu Kota Palu **NaraSumber**: Abdul Rahman, S. Hut., M.S (UniversitasTadulako)
9.30 – 10.00	Pemaparan Tahap Identifikasi Isu Pembangunan Berkelanjutan.	Tim Konsultan Penyusun KLH RDTR Kota Palu BWP I, II, dan IV
0.00 – 12.00	Diskusi dan Penyepakatan: Isu Pembangunan Berkelanjutan.	**Fasilitator:** Tim Konsultan Penyusun KLH RDTR Kota Palu BWP I, II, dan IV Peserta: Seluruh Undangan
2.00 – 13.00	ISHOMA	
esi 2: Identifikasi dan Perumusan Isu Pembangunan Berkelanjutan Paling trategis&		
Identifikasi dan Perumusan Isu Pembangunan Berkelanjutan Prioritas		
3.00 – 13.45	Diskusi dan Penyepakatan: Isu Pembangunan Berkelanjutan Paling Strategis berdasarkan hasil penapisan terhadap isu pembangunan berkelanjutan.	**Fasilitator:** Tim Konsultan Penyusun KLH RDTR Kota Palu BWP I, II, III, I Peserta: Seluruh Undangan
3.45-14.30	Diskusi dan Penyepakatan: Isu Pembangunan Berkelanjutan Prioritas berdasarkan hasil penapisan terhadap Isu Pembangunan Berkelanjutan Paling Strategis.	**Fasilitator:** Tim Konsultan Penyusun KLH RDTR Kota Palu BWP I, II, III, I Peserta: Seluruh Undangan
4.30 – 15.00	Penandatanganan Berita Acara Isu Pembangunan Berkelanjutan Prioritas	Seluruh Undangan

PEMERINTAH PROVINSI SULAWESI TENGAH
BADAN PERENCANAAN PEMBANGUNAN DAERAH
(B A P P E D A)
Jln. Prof. Dr. Moh. Yamin, SH No. Telp. (0451) 421844 - 421845
PALU – SULTENG (94112)

Palu, 24 Juli 2019

Nomor : 005/11.42/Bid.III
Lampiran : 1 (satu) lembar
Perihal : Rapat Koordinasi.

Kepada Yth,

.....
(Daftar Terlampir)
Di -
Tempat.-

Dalam Rangka Pelaksanaan Rehabilitasi dan Rekonstruksi (RR) Pasca Bencana Alam di Provinsi Sulawesi Tengah, maka perlu dilakukan rapat koordinasi antara OPD terkait dan mitra pemerintah lainnya. Sehubungan dengan hal tersebut bersama ini kami mengharapkan kiranya menugaskan Kepala Bidang dan Kasubag Program untuk menghadiri rapat koordinasi dimaksud, yang akan dilaksanakan Pada

Hari / Tanggal	: Jum'at, 26 Juli 2019.
J a m	: 08.30 WITA – selesai
Tempat	: Ruang Kerja Kepala Bidang Perencanaan Infrastruktur dan Pengembangan Wilayah Bappeda Prov. Sulawesi Tengah Jln. Prof. Dr. Moh. Yamin Palu.
Agenda	: Progres Pelaksanaan RR 2019 dan Rencana Tahun 2020

Demikian disampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.

KEPALA BAPPEDA
PROVINSI SULAWESI TENGAH,

PEMERINTAH PROVINSI SULAWESI TENGAH BAPPEDA

Dr. HASANUDDIN ATJO, M.P.
Pembina Utama Madya
NIP. 19600514 198503 1 016

Tembusan disampaikan kepada Yth. :
1. Gubernur Sulawesi Tengah (sebagai laporan), di Palu;
2. Sekretaris Daerah Provinsi Sulawesi Tengah, di Palu;

LAMPIRAN

Nomor : 005/11.42/Bid.III
Tanggal : 24 Juli 2019
Perihal : Rapat Koordinasi

---

1. Kepala Dinas Cipta Karya dan Sumber Daya Air Provinsi Sulawesi Tengah, di Palu;
2. Kepala Badan Penanggulangan Bencana Daerah Provinsi Sulawesi Tengah, di Palu;
3. Kepala Dinas Perumahan, Permukiman dan Pertanahan Provensi Sulwesi Tengah.
4. Kepala Balai Wilayah Sungai Sulawesi III, Provensi Sulawesi Tengah di Palu;
5. Kepala Balai Prasarana Permukiman Wilayah Provinsi Sulawesi Tengah.
6. Kepala Balai Pelaksanâ Jalan Nasional (BPJN) XIV Palu.
7. Kepala Bidang Air Minum dan Penyehatan Lingkungan Permukiman Dinas Cipta Karya dan Sumber Daya Air Provinsi Sulawesi Tengah.
8. Kepala Bidang Irigasi dan Rawa Dinas Cipta Karya dan Sumber Daya Air Provinsi Sulawesi Tengah.
9. Kepala Satker PJPA Balai Wilayah Sungai III Provinsi Sulawesi Tengah.
10. Kepala Satker TP OP Dinas Cipta Karya dan Sumber Daya Air Provinsi Sulawesi Tengah.
11. Tim JICA
12. Tim Asian Development Bank (ADB).

KEMENTERIAN AGRARIA DAN TATA RUANG/
BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kotak Pos 12110
Telp. 021-7396640 : www.atr-bpn.go.id

Nomor : 267/Und.200.13Tu.01.02/VII/2019 Jakarta, 24 Juli 2019
Lampiran : 1 (satu) berkas
Perihal : Permohonan Narasumber *Focus Group Disscusion* II Kegiatan Revisi RTRW Provinsi Sulawesi Tengah Berbasis Mitigasi Bencana

Yth. Direktur Tata Ruang dan Pertanahan, Kementerian PPN/Bappenas
di Tempat

Sehubungan dengan kegiatan Revisi Rencana Tata Ruang Wilayah (RTRW) Provinsi Sulawesi Tengah Berbasis Mitigasi Bencana yang dilaksanakan oleh Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah, Direktorat Jenderal Tata Ruang Kementerian Agraria dan Tata Ruang/BPN, kami bermaksud melaksanakan FGD II yang akan membahas tentang hasil analisis dan perumusan konsep pengembangan wilayah, yang akan dilaksanakan pada:

Hari/Tanggal : Senin, 29 Juli 2019
Waktu : 09.00 WITA - selesai
Tempat : Hotel Santika Palu
Jl. Moh. Hatta No.18, Lolu Utara, Palu Timur, Kota Palu

Berkenaan dengan agenda tersebut, kami mohon kesediaan Bapak/Ibu/Sdr. untuk menjadi penanggap dalam kegiatan tersebut (jadwal acara terlampir). Sebagai informasi, kami menanggung transportasi (PP), uang harian, dan akomodasi untuk narasumber selama acara berlangsung. Konfirmasi kesediaan kehadiran Bapak/Ibu/Sdr. sebagai Narasumber dapat disampaikan kepada kami melalui email bimtek3taru@gmail.com paling lambat hari Jumat 26 Juli 2019. Untuk informasi lebih lanjut dapat menghubungi Sabana (082280221509).

Demikian disampaikan, atas perhatiannya diucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang
dan Pemanfaatan Ruang Daerah

Reny Windyawati, ST., M.Sc.
NIP. 19711122 199703 2 001

Tembusan :
- Direktur Jenderal Tata Ruang (sebagai laporan).

Lampiran I

Daftar Undangan

I Kementerian/ Lembaga

1. Kepala Kantor Wilayah Badan Pertanahan Nasional Provinsi Sulawesi Tengah
2. Kepala Balai Pemantapan Kawasan Hutan (BPKH) Wilayah XVI Palu
3. Kepala Balai Wilayah Sungai Sulawesi III
4. General Manager PT. PLN (Persero) Regional Sulawesi Tengah

II Pemerintah Provinsi Sulawesi Tengah

1. Kepala Badan Perencanaan, Penelitian, dan Pengembangan Daerah (Bapelitbangda) Provinsi Sulawesi Tengah
2. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah
3. Kepala Dinas Kesehatan Provinsi Sulawesi Tengah
4. Kepala Dinas Koperasi, Usaha Kecil dan Menengah Provinsi Sulawesi Tengah
5. Kepala Dinas Perindustrian dan Perdagangan Provinsi Sulawesi Tengah
6. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah
7. Kepala Dinas Pendidikan dan Kebudayaan Provinsi Sulawesi Tengah
8. Kepala Dinas Kelautan dan Perikanan Provinsi Sulawesi Tengah
9. Kepala Dinas Cipta Karya dan Sumber Daya Air Provinsi Sulawesi Tengah
10. Kepala Dinas Perhubungan Provinsi Sulawesi Tengah
11. Kepala Dinas Sosial Provinsi Sulawesi Tengah
12. Kepala Dinas Tenaga Kerja dan Transmigrasi Provinsi Sulawesi Tengah
13. Kepala Dinas Tanaman Pangan dan Hortikultura Provinsi Sulawesi Tengah
14. Kepala Dinas Perkebunan dan Peternakan Provinsi Sulawesi Tengah
15. Kepala Dinas Pangan Provinsi Sulawesi Tengah
16. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah
17. Kepala Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah
18. Kepala Badan Pendapatan Daerah Provinsi Sulawesi Tengah
19. Kepala Badan Penanggulangan Bencana Daerah Provinsi Sulawesi Tengah

II Pemerintah Kota Palu

1. Kepala Badan Perencanaan Pembangunan Daerah Kota Palu
2. Kepala Dinas Penataan Ruang dan Pertanahan Kota Palu

III Pemerintah Kabupaten Sigi

1. Kepala Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah Kabupaten Sigi
2. Kepala Dinas Pekerjaan Umum dan Perumahan Kabupaten Sigi

IV Pemerintah Kabupaten Donggala

1. Kepala Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah Kabupaten Donggala
2. Kepala Dinas Pekerjaan Umum dan Tata Ruang Kabupaten Donggala

V Pemerintah Kabupaten Parigi Moutong

1. Kepala Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah Kabupaten Parigi Moutong
2. Kepala Dinas Pekerjaan Umum Penataan Ruang dan Pertanahan Kabupaten Parigi Moutong

VI Pemerintah Kabupaten Banggai

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Banggai
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Banggai

VII Pemerintah Kabupaten Banggai Kepulauan

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Banggai Kepulauan
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Banggai Kepulauan

VIII Pemerintah Kabupaten Banggai Laut

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Banggai Laut
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Banggai Laut

IX Pemerintah Kabupaten Buol

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Buol
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Buol

X Pemerintah Kabupaten Morowali

1. Kepala Badan Perencanaan, Penelitian, dan Pembangunan Daerah Kabupaten Morowali
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Morowali

XI Pemerintah Kabupaten Morowali Utara

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Morowali Utara
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Morowali Utara

XII Pemerintah Kabupaten Poso

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Poso
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Poso

XIII Pemerintah Kabupaten Tojo Una-Una

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Tojo Una-Una
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Tojo Una-Una

XIV Pemerintah Kabupaten Tolitoli

1. Kepala Badan Perencanaan Pembangunan Daerah Kabupaten Tolitoli
2. Kepala Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Tolitoli

XV Mitra

1. Tim JICA

Lampiran II

RUNDOWN ACARA
FGD II Kegiatan Revisi RTRW Provinsi Sulawesi Tengah
29 Juli 2019

Waktu	Acara	Keterangan
08.00 – 09.00	Registrasi Peserta	Panitia
09.00 – 09.15	Sambutan dan Pembukaan	Sekretaris Daerah Provinsi Sulawesi Tengah
09.15 – 09.30	Pengantar FGD	Direktur Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah
09.30 – 12.00	1) Paparan : Hasil Analisis dan Konsep Pengembangan Wilayah Provinsi Sulawesi Tengah 2) Tanggapan : a. Kebijakan terkait Rencana Pengembangan Provinsi Sulawesi Tengah dalam Draft RPJMN Tahun 2020 – 2024 b. Bahaya dan Risiko Bencana Provinsi Sulawesi Tengah 3) Diskusi dan Tanya Jawab	**Pemapar :** Tim Penyusun/Konsultan **Penanggap :** 1. Kementerian PPN/Bappenas 2. Akademisi Universitas Tadulako **Moderator :** Kepala Dinas Bina Marga Penataan Ruang Provinsi Sulawesi Tengah
12.00 – 13.00	*ISHOMA*	
13.00 – 15.30	Diskusi Lanjutan Hasil Analisis dan Perumusan Konsep Rencana Pengembangan Wilayah	**Moderator:** Kepala Dinas Bina Marga Penataan Ruang Provinsi Sulawesi Tengah
15.30 – 16.00	Penandatanganan Berita Acara Kesepakatan	Stakeholder Terkait
16.00 – 16.30	Kesimpulan dan Penutup	Kepala Dinas Bina Marga Penataan Ruang Provinsi Sulawesi Tengah

KEMENTERIAN AGRARIA DAN TATA RUANG/
BADAN PERTANAHAN NASIONAL
DIREKTORAT JENDERAL TATA RUANG
Jalan Raden Patah I Nomor 1, Kebayoran Baru, Jakarta Selatan Kotak Pos 12110
Telp. 021-7396640 : www.atr-bpn.go.id

Nomor : 255/und.200.13 TU.01.02/VII/2019 Jakarta, 22 Juli 2019
Lampiran : 1 (satu) berkas
Perihal : Permohonan Fasilitasi Undangan FGD II dan Konsultasi Publik KLHS Kegiatan Revisi RTRW dan Penyusunan RDTR Kabupaten Sigi Berbasis Mitigasi Bencana

Yth. Bupati Sigi
cq. Sekretaris Daerah Kabupaten Sigi
di Tempat

Sehubungan dengan kegiatan Revisi Rencana Tata Ruang Wilayah (RTRW) dan Penyusunan Rencanan Detail Tata Ruang (RDTR) Kabupaten Sigi Berbasis Mitigasi Bencana yang dilaksanakan oleh Direktorat Pembinaan Perencanaan Tata Ruang dan Pemanfaatan Ruang Daerah, Direktorat Jenderal Tata Ruang Kementerian Agraria dan Tata Ruang/BPN, kami bermaksud melaksanakan FGD II yang akan membahas tentang analisis dan perumusan konsep revisi RTRW dan RDTR Kabupaten Sigi, serta konsultasi publik KLHS dalam rangka penajaman isu pembangunan berkelanjutan prioritas.

Untuk itu kami mohon kesediaan Pemerintah Kabupaten Sigi untuk memfasilitasi undangan pelaksanaan kegiatan tersebut yang akan dilaksanakan pada:

Hari/Tanggal	: Selasa - Rabu, 30 – 31 Juli 2019
Waktu	: 09.00 WITA - selesai
Tempat	: Hotel Santika Palu Jl. Moh. Hatta No.18, Lolu Utara, Palu Timur Kota Palu, Provinsi Sulawesi Tengah

Adapun peserta yang diundang adalah Pemerintah Provinsi Sulawesi Tengah, seluruh Organisasi Pemerintahan Daerah (OPD) Kabupaten Sigi serta pemangku kepentingan lain sebagaimana terlampir.

Demikian kami sampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.

Direktur Pembinaan Perencanaan Tata Ruang
dan Pemanfaatan Ruang Daerah

Reny Windyawati, ST., M.Sc.
NIP. 19711122 199703 2 001

Tembusan :
- Direktur Jenderal Tata Ruang (sebagai laporan).

Lampiran I
Nomor Surat :
Tanggal :

Daftar Undangan FGD II

I Kementerian/ Lembaga

1. Kepala Kantor Pertanahan Badan Pertanahan Nasional Kabupaten Sigi
2. Kepala Balai Pemantapan Kawasan Hutan (BPKH) Wilayah XVI Palu
3. Kepala Kantor Telkom Kabupaten Sigi
4. Kepala PDAM Kabupaten Sigi
5. Manager PT. PLN Area Kabupaten Sigi

II Pemerintah Provinsi Sulawesi Tengah

1. Kepala Badan Perencanaan, Penelitian, dan Pengembangan Daerah (Bapelitbangda) Provinsi Sulawesi Tengah
2. Kepala Dinas Bina Marga dan Penataan Ruang Provinsi Sulawesi Tengah
3. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah
4. Kepala Dinas Perhubungan Provinsi Sulawesi Tengah
5. Kepala Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah
6. Kepala Dinas Tanaman Pangan dan Hortikultura Provinsi Sulawesi Tengah
7. Kepala Badan Penanggulangan Bencana Daerah Provinsi Sulawesi Tengah

IIII Pemerintah Kabupaten Sigi

1. Kepala Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah Kabupaten Sigi
2. Kepala Dinas Pekerjaan Umum dan Perumahan Kabupaten Sigi
3. Kepala Dinas Pariwisata Kabupaten Sigi
4. Kepala Dinas Perhubungan Kabupaten Sigi
5. Kepala Dinas Perindustrian dan Perdagangan Kabupaten Sigi
6. Kepala Dinas Komunikasi dan Informatika Kabupaten Sigi
7. Kepala Dinas Lingkungan Hidup Kabupaten Sigi
8. Kepala Dinas Pertanian, Tanaman Pangan, dan Holtikultura Kabupaten Sigi
9. Kepala Dinas Kependudukan dan Pencatatan Sipil Kabupaten Sigi
10. Kepala Badan Keuangan dan Aset Daerah Kabupaten Sigi
11. Kepala Badan Penanggulangan Bencana Daerah Kabupaten Sigi
12. Kepala Badan Pusat Statistik Kabupaten Sigi
13. Camat Sigi Biromaru
14. Camat Dolo

Lampiran II
Nomor Surat :
Tanggal :

Daftar Undangan Konsultasi Publik KLHS

I Kementerian/ Lembaga

1. Kepala Kantor Pertanahan Badan Pertanahan Nasional Kabupaten Sigi
2. Kepala Balai Pemantapan Kawasan Hutan (BPKH) Wilayah XVI Palu
3. Kepala Kantor Telkom Kabupaten Sigi
4. Kepala PDAM Kabupaten Sigi
5. Manager PT. PLN Area Kabupaten Sigi

II Pemerintah Kabupaten Sigi

1. Kepala Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah Kabupaten Sigi
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4. Kepala Dinas Perhubungan Kabupaten Sigi
5. Kepala Dinas Perindustrian dan Perdagangan Kabupaten Sigi
6. Kepala Dinas Komunikasi dan Informatika Kabupaten Sigi
7. Kepala Dinas Lingkungan Hidup Kabupaten Sigi
8. Kepala Dinas Pertanian, Tanaman Pangan, dan Holtikultura Kabupaten Sigi
9. Kepala Dinas Kependudukan dan Pencatatan Sipil Kabupaten Sigi
10. Kepala Badan Keuangan dan Aset Daerah Kabupaten Sigi
11. Kepala Badan Penanggulangan Bencana Daerah Kabupaten Sigi
12. Kepala Badan Pusat Statistik Kabupaten Sigi
13. Camat Sigi Biromaru
14. Camat Dolo
15. Camat Pipikoro
16. Camat Kulawi Selatan
17. Camat Kulawi
18. Camat Lindu
19. Camat Nokilalaki
20. Camat Palolo
21. Camat Gumbasa
22. Camat Dolo Selatan
23. Camat Dolo Barat
24. Camat Tanambulava
25. Camat Marawola
26. Camat Marawola Barat
27. Camat Kinovaro
28. Kepala Desa Karawana
29. Kepala Desa Langaleso
30. Kepala Desa Kotarindau
31. Kepala Desa Potoya
32. Kepala Desa Kabobana
33. Kepala Desa Bora
34. Kepala Desa Watumonju
35. Kepala Desa Olobuju
36. Kepala Desa Sidera

37. Kepala Desa Jono Oge
38. Kepala Desa Ponbewa
39. Kepala Desa Lolu
40. Kepala Desa Kalukuba
41. Kepala Desa Mpanau
42. Kepala Desa Loru
43. *Dan pemangku kepentingan lain (jika diperlukan)*