1. Minutes of Meetings

List Table of Minutes of Meeting

Dam Discussion by Balai Teknik Bendungan

No.	Date	Activity
1	Monday, August 7, 2023	Meeting and discussion of Temef and Manikin Dam
2	Tuesday, October 3, 2023	Meeting and discussion of Temef Dam
3	Friday, October 27, 2023	Meeting and discussion ofAmeroro Dam
4	Wednesday, November 15, 2023	Meeting and discussion of Beringin Sila Dam
5	Thursday, November 16, 2023	Meeting and discussion of Bintang Bano Dam
6	Friday, November 17, 2023	Meeting and discussion of Temef Dam
7	Wednesday, November 22, 2023	Meeting and discussion of Sei Harapan and Sei Ladi Dam
8	Monday, December 11, 2023	Meeting and discussion of Sukamahi Dam
9	Tuesday, December 12, 2023	Meeting and discussion of Manikin Dam
10	Monday, April 22, 2024	Meeting and discussion of Cijurey Dam
11	Monday, May 13, 2024	Meeting and discussion of Meninting Dam
12	Tuesday, May 14, 2024	Meeting and discussion of Keuroto Dam
13	Monday, May 15, 2024	Meeting and discussion ofLausimeme Dam
14	Thursday, May 30, 2024	Meeting and discussion of Sadawarna Dam
15	Monday, June 3, 2024	Meeting and discussion of Manikin Dam
16	Wednesday, June 12, 2024	Meeting and discussion of Bendo Dam
17	Friday, June 14, 2024	Meeting and discussion of Sepaku Semoi Dam
18	Wednesday, June 19, 2024	Meeting and discussion of Sadawarna Dam
19	Tuesday, June 25, 2024	Meeting and discussion of Budong Budong Dam
20	Thrusday, June 27, 2024	Meeting and discussion ofLuewikeris Dam
21	Friday, June 28, 2024	Meeting and discussion of Sepaku Semoi Dam
22	Tuesday, July 9, 2024	Meeting and discussion of Rukoh Dam
23	Wednesday, July 10, 2024	Meeting and discussion of Cibeet Dam
24	Thursday, July 11, 2024	Meeting and discussion of Jlantah Dam
25	Tuesday, July 15, 2024	Meeting and discussion of Rukoh Dam
26	Tuesday, July 16, 2024	Meeting and discussion of Cibeet Dam
27	Wednesday, July 17, 2024	Meeting and discussion of Jlantah Dam
28	Monday, July 22, 2024	Meeting and discussion of Sadawarna Dam
29	Friday, August 9, 2024	Meeting and discussion of Manikin Dam
30	Tuesday, August 20, 2024	Meeting and discussion of Semantok Dam
31	Thrusday, August 29, 2024	Meeting and discussion of Jlantah Dam
32	Friday, August 30, 2024	Meeting and discussion of Sidan Dam
33	Thrusday, September 5, 2024	Meeting and discussion of Lausimeme Dam
34	Friday, September 6, 2024	Meeting and discussion of Marangkayu Dam
35	Monday, September 9, 2024	Meeting and discussion of Melawi Dam
36	Tuesday, September 10, 2024	Meeting and discussion of Bagong Dam
37	Tuesday, September 17, 2024	Meeting and discussion of Lausimeme Dam
38	Friday, September 20, 2024	Meeting and discussion of Keuroto Dam
39	Tuesday, September 24, 2024	Meeting and discussion of Rukoh Dam
40	Wednesday, September 25, 2024	Meeting and discussion of Meninting Dam
41	Thrusday, September 26, 2024	Meeting and discussion of Sidan Dam
42	Friday, September 27, 2024	Meeting and discussion of Tamblang Dam
43	Friday, October 4, 2024	Meeting and discussion of Budong-Budong Dam
44	Monday, October 7, 2024	Meeting and discussion of Jlantah Dam
45	Tuesday, October 8, 2024	Meeting and discussion of Rukoh Dam
46	Wednesday, October 9, 2024	Meeting and discussion of Sidan Dam
47	Friday, October 18, 2024	Meeting and discussion of Way Apu Dam
48	Monday, October 21, 2024	Meeting and discussion of Marangkayu Dam
49	Wednesday, October 30, 2024	Meeting and discussion of Kuwil Kwangkon Dam

Others:

1	Friday, December 8, 2023	Joining meeting discussions and documenting KNI-BB Dam National Seminary
2	Friday, February 23, 2024	Dam Risk Assesment Meeting with BTB Staff
3	Friday, March 01, 2024	Dam Risk Assesment Meeting with BTB Staff
4	Friday, March 15, 2024	Dam Risk Assesment Meeting with BTB Staff
5	Wednesday, July 31, 2024	Joining meeting discussions and documenting meeting minutes Meninting Dam KNIBB Webinar
6	Tuesday, October 17, 2024	INACOLD Preparation

TECHNICAL DISCUSSION ON THE CONSTRUCTION OF THE TEMEF DAM, TIMOR TENGAH SELATAN AND MANIKIN DAM, KUPANG REGENCY, EAST NUSA TENGGARA PROVINCE

Day/date	**:** Monday, 7 August 2023
Time	: 09.00 WIB to. finished
Venue	:Meeting Room of Nakan Dam, 2nd Floor of Balai Dam Building, Jalan Sapta Taruna Raya, Pasar Jumat Public Works Complex, South Jakarta
Event	: Discussion of Temef Dam Construction Implementation, South Central Timor Regency, and Manikin Dam, Kupang Regency, East Nusa Tenggara Province
Participant	: List Attached

DISCUSSION AND CONCLUSION

1. **MANIKIN DAM**
   a) In Manikin Dam, water is the main factor that becomes a problem in the Manikin Dam tunnel, so dewatering is needed to control the water around the tunnel.
   b) The deformation conditions considered the cause must be corrected first, the cause is water so the cause of the water must be handled.
   c) The temporary support is still used in the tunnel so that calculations do not use saturation parameters (submerge)
   d) The swelling test needs to be reviewed again because the pressure generated is too small. The calculation of the swelling pressure must be until the rock does not expand anymore, so that number is used as the maximum swelling pressure (data still in progress)
   e) All tunnels are deformed, which means that the maximum swelling pressure must be properly recorded so that the design parameters are used with pessimistic numerical values (data not available yet)
   f) An OW is required for groundwater monitoring around the tunnel to obtain accurate data that supports the tunnel repair process.
   g) Additional reinforcement of the tunnel with rock bolt, and the length of the rock bolt is more than standard.
   h) The suggestion of rock bolts needs to be reviewed because the soil conditions are considered (by local experts) not suitable for rock bolt solutions.

2. **TEMEF**
   a) Temef Dam is still an avalanche of spillway walls that is still open and allows it to widen and spread if it is not immediately closed and handled, for the main treatment it is recommended to do the closure with the gabion system.
   b) of the 3 samples taken from the Bobonaro formation, it has a swelling pressure of 452-750 Kpa, with a swelling presentation of 10.0-12.9 %
   c) The building structure must be in a stable layer of soil and not change its nature, so it is better if the rock bolt needs to reach a stable layer of soil, therefore the anchor needs to reach the layer of sandstone.

   d) The anchor will be installed first and then connected with reinforced concrete on the spillway floor.
   e) It is also necessary to consider the swelling pressure in the horizontal direction, the spillway walls are hanging down there is a potential for collapse due to horizontal swelling.
   f) Need to add gabions from bottom to top to cover the avalanches that occur, and vines can be added on top.
   g) Near the limestone where the landslide occurred, there are still cracks around the landslide which are feared to become another landslide, so the crack is treated by covering the crack with a mixture of cement: water, and on top it will be covered again with clay.
   h) It is necessary to carry out the anchor pullout test to determine the strength of the installed anchor.

Emendation to each Dam will be carried out as soon as this week, as per review will be carried out this week.

Minutes of Meeting-August 7, 2023

TECHNICAL DISCUSSION ON THE CONSTRUCTION OF THE TEMEF DAM, TIMOR TENGAH SELATAN AND MANIKIN DAM, KUPANG REGENCY, EAST NUSA TENGGARA PROVINCE

Day/date	**:** Monday, 3 October 2023
Time	: 09.00 WIB to. finished
Venue	:Meeting Room of Nakan Dam, 2nd Floor of Balai Dam Building, Jalan Sapta Taruna Raya, Pasar Jumat Public Works Complex, South Jakarta
Event	: Discussion of Temef Dam Construction Implementation, South Central Timor Regency, and Manikin Dam, Kupang Regency, East Nusa Tenggara Province
Participant	: List Attached

DISCUSSION AND CONCLUSION

1. **TEMEF (**3 October 2023)

- handling of the left slope of the spillway
- gabion protection, regulation of ground water drainage to anticipate bobonaro September 27, 2023 there was a new landslide
- landslides up to 20 m
- removal of material for safety
- Landslides have occurred without any rain in recent days, there are already cracks
- possible modifications to the legs of the structure, Cracks will be immediately backfilled to avoid the possibility of material falling
- completion target end of October (Spillway)
- earthquake 31 August 6.1 richter r.37 kg

Emendation will be carried in site visit in Wednesday.

MINUTES OF TECHNICAL DISCUSSION PRE-PLENARY OF DAM SAFETY COMMISSION
DISCUSSION OF CONSTRUCTION IMPLEMENTATION AND INITIAL FILLING READINESS OF AMERORO DAM RESERVOIR

Day / Date	: Friday, October 27, 2023
Venue	: Sermo Dam Meeting Room, 2nd Floor Dam Hall Building, Sapta Taruna Raya Street, PU Market Complex Friday, South Jakarta
Time	: 08.30 WIB – finished
Event	: Discussion on the Implementation of the Ameroro Dam Construction, Konawe Regency, Southeast Sulawesi Province

I. The meeting was attended by:→Attach

II. Conclusion and Suggestions:

A. General

The Ameroro Dam was built on the Ameroro River, located in Tamesandi Village, Uepai District, Konawe Regency, Southeast Sulawesi Province. Geographically, the planned watershed of the Ameroro Dam is located between 120o45' – 124o45' E and 02o45' – 06o15' S. The type of Ameroro Dam is a rockfill zonal dam with a vertical core, with a maximum height of 82 m from the bottom of the deepest foundation excavation. The elevation of the dam crest is +128.50 m, with a dam crest length of 292 m, and a crest width of 12 m. The upstream slope is designed to be 1:2.25 and the downstream slope is 1:2.0. The reservoir to be formed has a total storage of 98.81 million m3 and an effective storage volume of 88.27 million m3.

The Ameroro Dam will have multipurpose benefits, namely for the provision of irrigation water for 3,363 Ha and the provision of raw water of 511 liters/second for Konawe Regency. Also, for flood control with a Q50 flood reduction of 443.34 m3/second (13.13%) and a 1.3 MW PLTMH. The initiator of the construction of the Ameroro Dam is the Sulawesi IV River Basin Center which appointed several service providers in the construction process, including:

- Implementing ContractorPackage 1: PT.
- Implementing ContractorPackage 2: PT. Hutama Karya (Persero)
- Supervision consultants: PT. Mettana KSO.

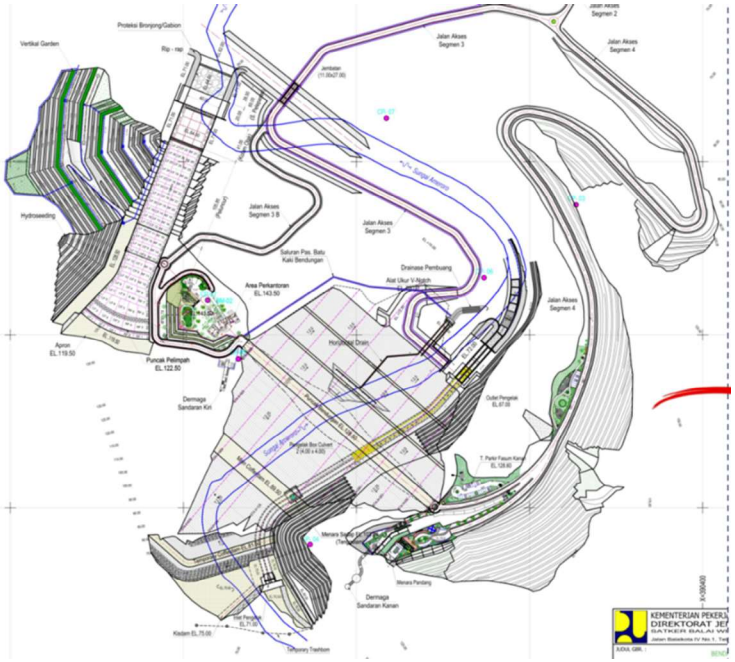


Figure 1: Layout plan of Ameroro Dam

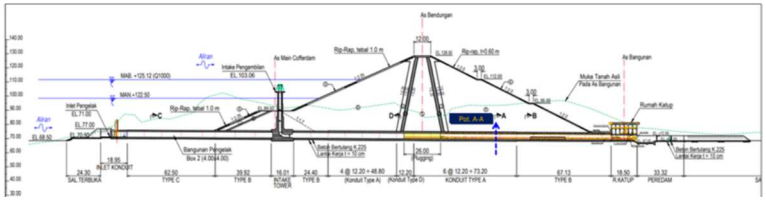


Figure 2: Cross section of the Ameroro Dam

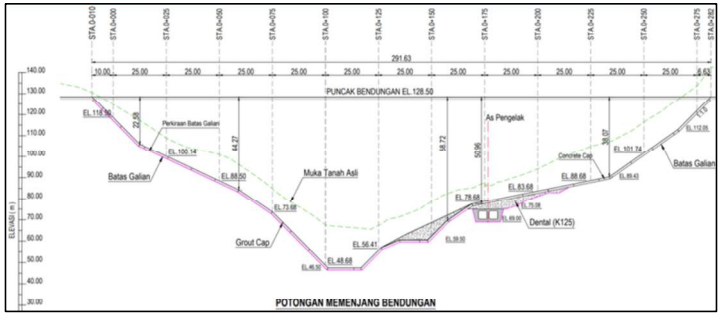
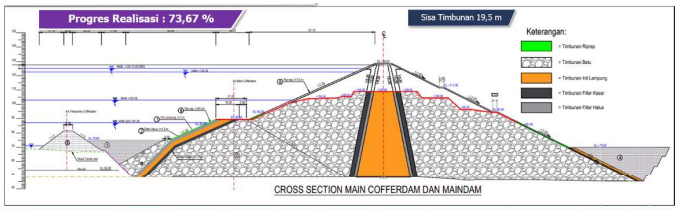


Figure 3: Longitudinal cross-section of the Ameroro Dam

As of October 27, 2023, the progress of the Ameroro Dam construction has reached 87.15%, and it is planned to carry out the initial filling of the reservoir on November 25, 2023. On October 27, 2023, a Technical Discussion of the Dam Safety Commission Discussion of the Construction Implementation and Readiness of the Initial Filling of the Ameroro Dam Reservoir, Konawe Regency, Southeast Sulawesi Province, was held. The discussion resulted in the following suggestions and conclusions.

B. Construction Progress

1. It was reported that the realization of the volume/day of embankment work did not reach the target.
   a. In order for the initial filling of the reservoir to be carried out according to the planned schedule, an acceleration plan should be drawn up to achieve the target, for example by adding human resources and heavy equipment.
   b. In achieving the target of the filling work, supervision should be carried out and it should be ensured that the filling results meet the required technical specifications by carrying out strict quality control in accordance with the work instructions (IK) that have been determined by the contractor and consultant.



No.	Zona Timbunan Main Dam	Total	Realisasi	Sisa Vol	Progres (%)	Target Volume / Hari	Realisasi Volume/ Hari	Kebutuhan Alat (Unit)		Target Penyelesaian	Ket
		m³	m³	m³		m³	m³	Kebutuhan	Realisasi		
1	Timbunan Zona -1 (Clay)	223229,00	153.363,87	69.865,19	68,70%	3.077,12	2.970,00	22 DT 10 Roda	24 DT 10 Roda	11-Nov-23	Ev. 109,00
2	Timbunan Zona -2 (Filter Halus)	52995,36	35.080,24	17.915,13	66,19%	1.452,90	1.400,00	49 DT 6 Roda	49 DT 6 Roda	11-Nov-23	Ev. 109,00
3	Timbunan Zona -3 (Filter Kasar)	82699,2	55.180,19	27.519,01	66,72%	2.022,58	2.030,00	95 DT 6 Roda	95 DT 6 Roda	11-Nov-23	Ev. 109,00
4	Timbunan Zona -4 (Random Material)	53919,32	53.919,32	-	-	-	-	-	-	-	Finish
5	Timbunan Zona -5 (Rock Fill)	1.062.354,82	816.009,55	246.285,27	76,82%	7.243,68	6.937,41	136 DT 10 Roda 167 DT 6 Roda	134 DT 10 Roda 163 DT 6 Roda	25-Nov-23	Ev. 105,50
6	Timbunan Zona -6 (Rip-rap)	45266	6.454,62	38.811,38	14,26%	1.026,70	360,00	33 DT 10 Roda (Alat Excavator 14 Unit)	33 DT 10 Roda (Alat Excavator 6 Unit)	30-Nov-23	Ev. 93,00
	Jumlah	1.920.463,76	1.120.067,79	400.396,97	73,67%						

Figure 4: Realization of dam body work has reached 73.67%

2. With the design of the spillway structure presented, it appears that there is no stilling basin, so it is estimated that the energy of the water flow from the launch channel when it reaches the endsill is still high.
   a. If possible, consider having the endsill upstream equipped with groundsills or concrete blocks.
   b. In the longitudinal cross-section of the spillway structure, the water flow profile should be depicted based on the results of the test model.
   c. It is reported that the spillway construction has reached the endsill, so to increase energy absorption, a 3-5 m high embankment/revetment construction will be added

downstream of the endsill. To evaluate the safety of the structure, the connection details between the existing structure and the structure to be added should be reported.

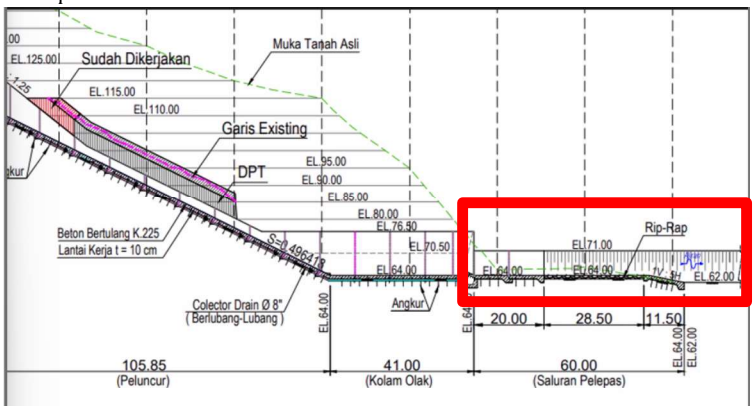


Figure 5: Longitudinal cross-section of the spillway structure

3. It is reported that the physical hydraulic modeling of the spillway structure was only carried out up to the Q5 return flood. In accordance with the Guidelines for Designing Embankment Dams Volume IV (1999), physical hydraulic modeling should be carried out up to Q100 in the stilling basin and Q1000 in the launch channel, so that areas in the spillway structure that have the potential to experience cavitation can be evaluated, so that they can be anticipated with design changes or reinforcement.

C. Geology and Engineering Geology

1. The foundation of the spillway building is Paleozoic metamorphic rock with a layering direction downstream of the dam. To increase slope stability, the floor of the spillway is equipped with anchor reinforcement.
   a. A safety analysis of the foundation of the launch channel should be carried out against uplift loads under conditions with and without anchors.
   b. The adequacy of the existing drainage system to release the uplift load on the spillway floor should be checked.
2. Identification and mapping of landslide potential on the slopes of reservoir basins should be carried out, then a landslide anticipation plan should be prepared, for example by planting vegetation or efforts to maintain existing vegetation to reduce the potential for landslides.

D. Dam Body Material

1. It is reported that the effective cohesion value (c') of the core zone is 0.52, while the percentage of grains passing the 200 sieve is around 80%. In these gradation conditions, c' 0.52 is considered too high, which will result in a higher safety factor than the actual one when used in the stability analysis later. Based on USBR, the recommended c' value is 0.25 kg/cm2 while the effective shear strength (ø') is 280. Consider using these values for the cohesion and shear strength in the stability analysis if the laboratory test results of the installed material have not yet been obtained.
2. It is reported that in order to obtain the shear strength parameters of the rockfill zone, an in-situ direct shear test has been conducted with a test box size of 70 cm, while the diameter of the largest material grain is 70 cm. In order to describe the actual embankment conditions in the field, in carrying out the in-situ direct shear test, the following are recommended:
   a. Referring to ASTM D3080-03, specimens should be prepared using compaction methods, water content, and unit weight appropriate to the embankment conditions in the field.
   b. You should pay attention to the maximum grain size that can be put into the test equipment box. If the maximum grain size of the rockfill zone material exceeds the size permitted by the test equipment, parallel scaling down/regrading of the material needs to be carried out first by paying attention to the compaction process per layer.
   c. The normal load (σ1,) applied to the specimen should be adjusted to the height of the Ameroro Dam (82 m).
   d. The results of large scale tests should be compared with the shear strength from USBR graphs, which are influenced by rock type, normal load (σ1,), and embankment density level.
   e. In addition to the shear strength parameters, the deformation modulus should also be obtained which will later be used in the deformation analysis.
3. Core zone backfilling should be done by paying attention to the pore water pressure monitoring graph of the embankment piezometer reading. The piezometer monitoring graph approaching the backfill progress indicates that the pore water pressure ratio of the embankment is high, so backfilling needs to be done carefully, for example by giving a pause until the piezometer reading drops.

E. Instrumentation

1. In the v-notch image presented, it can be seen that downstream of the seepage reservoir before the river, a fill construction has been made which is intended to prevent backwater from the river towards the v-notch.
   a. Check the design considerations considering that the river elevation is below the elevation of the reservoir, which is feared to cause seepage to not be able to flow from the reservoir to the river.
   b. The influence of embankments downstream of the seepage reservoir on the phreatic water conditions in the downstream rockfill zone should be analyzed. In this case, a comparison should be made between the safety factors in conditions with and without embankments downstream of the seepage reservoir.

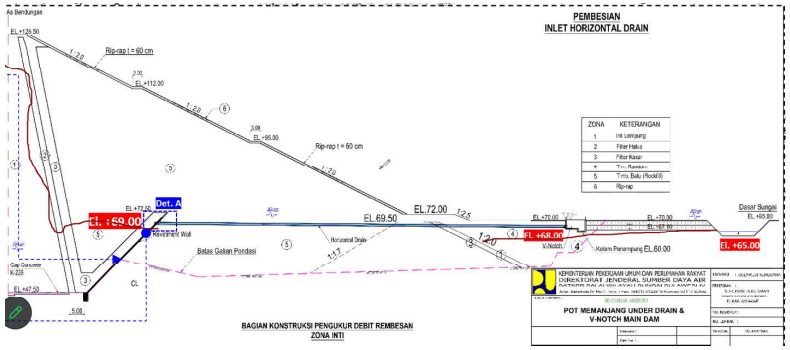


Figure 6: Cross-section of the v-notch design of the Ameroro Dam

F. Slope Stability Analysis

1. In the Ameroro Dam rockfill parameters used in the analysis model, the consultant used correlation parameters that were back analyzed and obtained the secant modulus (ES) value. A large scale triaxial test should be carried out to obtain the secant modulus (ES) value according to field conditions. Then, compare the secant modulus (ES) value and determine the results.

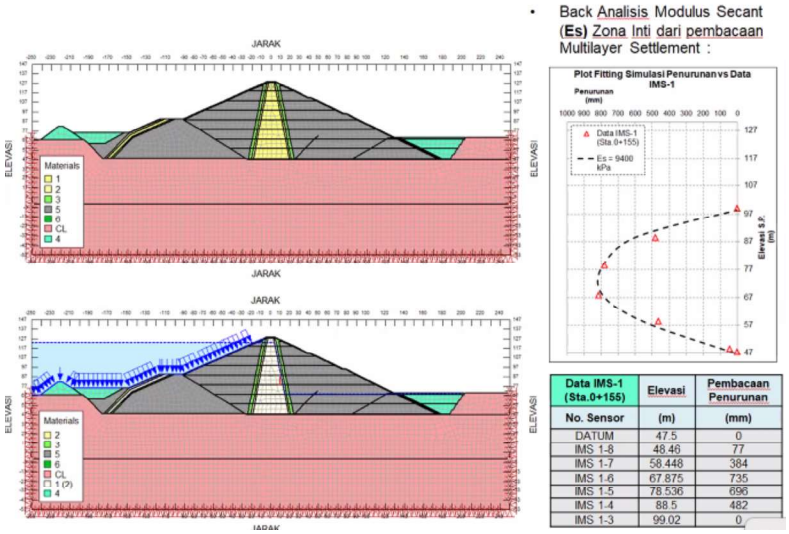


Figure 7: Results of back analysis in determining the secant modulus value of the Ameroro Dam

2. Considering the impounding plan is carried out at a new embankment condition reaching +115 m (remaining 13.5 m of embankment). In the modeling process, a stability analysis should be carried out on the potential for rapid drawdown in different water level conditions, in accordance with the applicable standard/guideline requirements.

G. Hydrological Analysis

1. The simulation of the reservoir water level increase during the initial reservoir filling was carried out using ground station and satellite rainfall series data. In order for the reservoir water level increase to be estimated in real time, the simulation should also be carried out using BMKG forecasting data presented in a quantitative initial reservoir filling prediction graph.
2. Ameroro Dam has not prepared an early warning system design that includes hardware and software. Based on existing ground station rainfall data and satellite rainfall data, modeling should be prepared to convert rainfall data into estimated flood discharge and flood water levels that will occur, which will then be used for decision making in early release and early warning system operations.
3. As early release data and early warning system, based on the evaluation of the increase in reservoir water level from simulation results against measurement results, a nomogram of rainfall prediction - rainfall that occurs - reservoir water level increase will be prepared. In order to approach the actual conditions, the nomogram should continue to be evaluated during the initial filling of the reservoir later.

H. Hydromechanical

1. The initial filling of the reservoir is planned to be carried out on November 25, 2023. For smooth implementation, all hydromechanical equipment must be installed (on-site) and commissioned. So, it is ready to operate on November 15, 2023. Documentation of implementation, commissioning minutes and others should be presented in the completion report and submitted to the Dam Engineering Center.

I. Preparation for Initial Reservoir Filling

1. Regarding the land acquisition process in the reservoir area,
   a. The status of the identified forest area in the reservoir inundation area should be reconfirmed, whether it is categorized as forest or not, by coordinating with the relevant stakeholders.
   b. If it has been confirmed that the reservoir area is a forest area, the clearing & grubbing process should be paid attention to so as not to damage the forest ecosystem.
2. Regarding the impounding implementation plan, there are 2 (two) date schemes, namely November 19, 2023 and November 25, 2023. An analysis should be carried out based on the achievement of the embankment elevation on both dates to see the readiness of the Ameroro Dam as seen from the height of the embankment which has reached an elevation of +115 m, the Hollow jet valve that has been installed, and other preparations.

J. Discussion Conclusion

1. The suggestions above and suggestions from previous discussions that are still relevant and have not been followed up on, should be followed up immediately, a follow-up report prepared, and then submitted to the Dam Engineering Center.

2. The technical requirements documents should be revised based on the above suggestions and any previous discussion suggestions that are still relevant.
3. Based on the results of the Dam Safety Commission Technical Discussion, it was agreed that after the above suggestions were followed up, then the follow-up report and improvements to the technical requirement documents were received by the Dam Engineering Center, the discussion would be continued in the next Dam Safety Commission Plenary Session.

TECHNICAL DISCUSSION
Preparation for Operation and Maintenance of Sukamahi Dam Dry Dam

Day/date	**:** Tuesday, December 11, 2023
Time	: 09.00 WIB to. finished
Venue	: Sermo Meeting Room 2nd Floor, Dam Engineering Hall Building. Jalan Sapta Taruna Raya, Pasar Jumat PU Complex, South Jakarta
Event	: TECHNICAL DISCUSSION: Preparation for Operation and Maintenance of Sukamahi Dam Dry Dam
Participant	: List Attached

DISCUSSION AND CONCLUSION

A. General:

- Baffle blocks are moved further upstream, don't block the flow of water in the canal and even disrupt the flow because they can block small rocks that should be able to pass too

B. Geology

1. Regional geology: geomorphology must be accompanied by a map
2. Stratigraphy: lithological visualization must be clear from the sequence of breccia, lava and others.
3. Take advantage of existing geological data, don't create new data that deviate from existing data records. The data should be in summary form, and don't even change the data.
4. Structural geology:
   - more focused, don't mix it with other data,
   - Eye mapping plots must be completed and presented more clearly,
   - complete the creation of geological as build drawings,
   - the most recent geological cross-section to be continued.
5. Geological data is incomplete and cannot be assessed.
6. Existing data must be recapitulated.
7. The data used must be the latest data
8. construction materials
   - The existing data is not yet equipped with wet density and dry density, which should be important data,
   - the existing data is good, but the statement is said to be wet. The contradiction between data and reality must be checked and cross-checked.
9. Core Zone Material

- The core material containing minerals is one of the factors that sometimes the water is high as a record of the dam's behavior,

- the core water content is high, so high water pressure impacts the condition of the minerals,
- random stones, in the field more soil. Lu is more than half, and random soil contains a lot of water. causing landslides. so the counterweight was repaired with stone, and the remainder of the stone zone pile was used 'sirtu'. All data should be in BTB.

10. Please make the data processing clearer and more detailed because much of the existing data has not been processed correctly.

Instrumentation

1. Presentation of sliding stake data should be separated from upstream to downstream
2. Isometer

- improving the analysis data and theory used so that the analysis can be better and can be read properly

3. There are 2 new piezometers which were replaced due to damage. and it has worked well.
4. read the final report so that the discussion does not repeat itself and can continue the history of the existence and performance of all tools. so that the data continues instead of being new and creating difficulties.
5. Deposition conditions can be used to calculate dystrophy or damage, incomplete recovery. Current conditions still use residuals for landslide areas for the short term. others can use effective stress. it is necessary to draw the contours of the images as a control.
6. The reading of the existing equipment needs to be confirmed again with the installation vendor because the reading results are found to be out of sync
7. climatology= WTG, wind turbine generator can be installed
8. stability: flood operating patterns
9. All inspections must be reviewed with the latest report so that the history can be recorded properly and is not confusing

Discussion of Evaluation of Reservoir Initial Filling Results and Operational Readiness of the Bintang Bano Dam, West Sumbawa Regency, West Nusa Tenggara Province

Day/date **:** Thursday, November 16, 2023
Time : 09.00 WIB to. finished
Venue : Sermo Meeting Room 2nd Floor, Dam Engineering Hall Building, Jalan Sapta Taruna Raya, Pasar Jumat PU Complex, South Jakarta
Event : Discussion of Evaluation of Reservoir Initial Filling Results and Operational Readiness of the Bintang Bano Dam, West Sumbawa Regency, West Nusa Tenggara Province

DISCUSSION AND CONCLUSION

Technical data

1. The emergency door upstream is the Intake door.

Visual Inspection

1. The inspection must comply with the form according to the existing USBR so that it is more organized (according to the BTB guidelines for Major Inspections, which the inspection consultant must follow)
2. Cracks on the right crest of the Dam ~Not Dangerous~ must be immediately closed and monitored.
3. Upstream Slope

- riprap looks like it doesn't meet specifications because the size of the stone is too fine, and only aesthetics are concerned ~ there will be filling in for reinforcement
- must be careful with the installed riprap stones.

4. Structure

- There is a leak in the bottom right corner of the door, and it has been repaired
- some are in dirty condition and need cleaning

Geology and engineering geology

1. completeness of the image; The coordinates for the dam placement must be displayed, legend and description
2. display engineering geological maps before, during construction and after construction only
3. The shotcrete was found to have many cracks
4. The selection of rip-rap rocks has been made

Material

1. The data does not suit the needs for analysis

Hydrology and Hydromechanics

1. rain gauge post; Added rain gate telemetry manual so it can be checked. However, an automatic rainfall recorder (ARR) is installed, and of course, it still requires a manual to install the ARM
2. the flood model is appropriate to the needs
3. early release, there is still confusion in the application, and it must be ready with complete RTOW; equipped with an early warning system
4. the role of the sluice gate must be maintained and paid attention to because of the vitality of its function
5. It is necessary to be equipped with software and hardware readiness and methods for their application for flood control
6. analysis of sedimentation according to predictions; if it is not appropriate, treatment must be provided
7. trap efficiency is immediately provided and must be adjusted
8. Sediment analysis and water quality do not comply with existing regulations, so the origin of water pollutants cannot be monitored
9. POW updates must continue to be carried out
10. needs to be equipped with a daily tank to complete the generator (spare tank)
11. Trash boom needs to be built immediately to make the spillway door smoother

OP-RTD

1. dam management organizational structure from description and division of tasks
2. AKNOP- Many of the OP's activities are unnatural and too big
3. The report flowchart is incomplete, and dam experts are there
4. The RTD report format needs to be detailed for each emergency
5. inundation and evacuation maps are incomplete and unclear

Dam Risk Assessment Meeting

Day/date : Friday, February 23, 2024
Time : 08.30 WIB to. finished
Venue : Sermo Meeting Room 2nd Floor, Dam Engineering Hall Building. Jalan Sapta Taruna Raya, Pasar Jumat PU Complex, South Jakarta
Event : Discussion of Filling Dam Risk Awareness Form for Indonesia Dam Database
Participant :

1. Shimizu Hiroshi (CTI Eng)
2. Rosihan (CTI Eng)
3. Zaki (CTI Eng)
4. Diana (CTI Eng)
5. Givi (Dam Hall)
6. Illya (Dam Hall)
7. Nabilla (Dam Hall)
8. Velita (Dam Hall)
9. Gregorius (Dam Hall)
10. Argha (Dam Hall)

DISCUSSION AND CONCLUSION

Agenda:

1. Reviewing the procedure for filling out the Dam Database form
2. Clarifying any questions or concerns regarding the form
3. Assigning responsibilities for completing and submitting the form

Meeting Summary:

The meeting commenced at 08:30 AM with all attendees present. The supervisor began by emphasizing the importance of accurately filling out the Dam Database form. The purpose of this form is to maintain updated records of dam-related information for regulatory compliance and safety purposes.

Discussion Points:

1. **Form Overview**: The supervisor provided an overview of the form, highlighting key sections such as dam identification, structural details, inspection records, and any recent maintenance or incidents.
2. **Clarification of Fields**: Each field in the form was reviewed, and any questions or uncertainties were addressed to ensure a clear understanding of the required information.
3. **Data Accuracy**: Emphasis was placed on the importance of accuracy when filling out the form. It was reiterated that discrepancies or inaccuracies could have serious consequences regarding regulatory compliance and dam safety.
4. **Submission Deadline**: The supervisor announced the deadline for submitting the completed form, ensuring that all team members are aware of the timeline and can plan accordingly to complete their sections in a timely manner.

5. **Responsibilities Assignment**: Specific responsibilities were assigned to each team member regarding the completion of different sections of the form. Clear deadlines were set for each task to ensure timely completion.
6. **Communication Channels**: It was emphasized that open communication channels will be maintained throughout the process, allowing team members to seek clarification or assistance as needed.
7. **Review Process**: A brief overview of the review process was provided, highlighting the steps involved in verifying the accuracy and completeness of the form before final submission.

Action Items:

1. [Diana and Arga]: To provide all team members access to the Dam Database form and guidelines.
2. [All PIC from Dam Hall]: To complete their respective sections of the form accurately and submit them by the specified deadline.
3. [Shimizu Hiroshi]: To oversee the review process and ensure the completeness and accuracy of the form before submission.

Next Meeting: The next meeting will be scheduled one week from today (Friday, March 1, 2024) to review the completed form and discuss any further actions or updates regarding the Dam Database.

Name list of PIC

1. Givi : Bendungan Bulango Ulu
2. Illya : Bendungan Meninting
3. Nabilla :Bendungan Bintang Bano
4. Velita : Bendungan Leuwikeris
5. Gregorius : Bendungan Tiu Suntuk
6. Argha : Bendungan Bener

Technical Session of the Dam Safety Commission (KKB) Discussion of the Major Inspection of the Sei Harapan & Sei Ladi Dams

Day/date **:** Wednesday, November 22, 2023
Time : 09.00 WIB to. finished
Venue : Sermo Meeting Room 2nd Floor, Dam Engineering Hall Building. Jalan Sapta Taruna Raya, Pasar Jumat PU Complex, South Jakarta
Event : Technical Session of the Dam Safety Commission (KKB) Discussion of the Major Inspection of the Sei Harapan & Sei Ladi Dams

DISCUSSION AND CONCLUSION
1st Session
Sei Ladi Dam
Structure

- there are porous walls in the intake house ~ recommended for repair with several recommendations

2ND SESSION;
SEI HARAPAN DAM

- problems regarding internal lighting
- there are puddles due to rainwater
- upstream slopes that need repair
- downstream slopes are experiencing erosion
- there are some parts of the drainage where the stone masonry is damaged

Main findings in the field~problem findisngs

1. Top of the dam: There is no surface drainage, not yet equipped with lighting; there is a puddle area 1 day after it rains.
2. Upstream Slope: Stone masonry as slope protection in several segments has been damaged. There is scouring in several areas due to rainwater
3. Downstream Slopes: There was scouring in several areas due to rainwater. Wet was found on the downstream slopes near the spillway conduit outlet. The surface drainage channel had been damaged in several areas, including sediment. The inspection stairs were damaged.
4. Pedestal Hill: The condition of the left and right Pedestal hills is vulnerable to erosion and is occupied by tuff sandstone rock units
5. Spillway: The condition of the spillway building on the surface appears to have been scoured/eroded on the concrete surface; there are traces of seepage on the

spillway wall; there is seepage on the concrete surface of the spillway wing wall; the stilling pool is in a flooded condition, There are cracks on the top concrete surface of the wall launch channel. The downstream part of the launch channel is filled with vegetation, and there are trees.

6. Top of saddle dam: wavy surface, cracks on upstream slope surface; - eroded in several areas; some slope protection has been damaged downstream slope - overgrown with trees, directly adjacent to residents' houses.

Visual Inspection~2023

- The road is good, complete with fences; there are plants, no drainage channels or lighting
- upstream slopes ~ surface erosion and animal holes in stone masonry are also damaged = repairs to puddles of water need to be made for drainage that is not just localized and is more planned as a system that reaches the water body completely with a complete design
- downstream slopes~ surface erosion in some areas; and the slopes have no protection; the drainage channels are overgrown with plants, which are detrimental and cause damage ~~ the new drainage design reduces the quality and can cause landslides because the design does not meet the needs ~~~ repairs are recommended with a bare rock because the existing precast can allow landslides because it is blocked and erodes the existing slope drainage (such as embankments-white drain)
- the need for sediment control by improving wall design and maintenance ~ included in OP (sediment barrier)
- The spillway has cracks and traces of seepage and exposed reinforcement, and there is no protective fence
- Exposed reinforcement is handled by following the latest SNI on concrete
- the lighthouse has hairline cracks, and there is sedimentation
- the conduit has seepage
- The spillway wing on the wall seepage of material from the weep hole is worried about erosion and removing embankment material.
- UPV is in poor condition
- The intake is starting to peel off.

Geology and Engineering Geology

- Images must be accompanied by captions~Latest updated map
- check why the b2 b3 drill points are close together
- The data presented must have been analyzed and evaluated for discussion
- Checked again regarding andesite rock data that appeared due to current regional conditions

dam body, foundation and riprap material upstream

- The data must be matrixed from 2017-last
- stratigraphic conditions must be readjusted

Instrumentation

- telemetry possible system incompatibility
- telemetry data must start to be recorded for the recommended path
- OW 3 There is an overflow of water; the water is higher than the ground elevation (pipes have been installed)
- The 2 newest V-notch positions are worrying because the placement is not appropriate, thus allowing mis-data
- list of any instrumentation data regarding its condition and history
- groundwater level contour analysis must be equipped with a matrix
- why OW must be created must be explained as data and analysis
- time settlement needs to be used as data in the analysis of existing instrumentation to measure the significance of the data
- the direction of consolidation movement must also be recorded (equipped with vector images)
- there is no grouting, so it is hoped that the embankment will be balanced to prevent water loss from the foundation from V-notch and OW data

Structure

- light of the building from 3-year inspections 2018;2022;2023 seepage from concrete joints does not come from the concrete itself
- The exposed concrete blanket has been structurally patched

Hydrology

- checking the runoff coefficient for reliable debit calculations
- There needs to be an updated and correct duration curve
- Enter updated and correct storage elevation rooting plate calculations
- calculation and study of erosion and sedimentation
- need a more detailed explanation regarding water quality

OP and RTD

- development and management history
- Organization~ OPB structure must be improved
- the background needs to be clarified and equipped with SKA
- workload analysis load must be clear
- Operation instructions must be provided

Minutes of Meeting-November 22, 2023

- AKNOP needs to be repaired
- POW, RTOW must be explained in plenary in detail
- RTD flood hydrograph must be repaired
- explanations regarding evacuation and evacuation gathering locations must be more detailed and evenly account for evacuation management
- Indications and potential for collapse must be made clear and detailed
- improvements to the communication flow chart between RTD implementers and internal and external parties

Electrical dan Hydromechanical

- trash boom and trashrack to be installed to avoid trash
- bottom outlet is not functioning at all; it is hoped that it will be repaired again to help spillway performance

All recommendations are recorded and carried out according to need and urgency so that they can be handled immediately.

TECHNICAL DISCUSSION
Preparation for Operation and Maintenance of Sukamahi Dam Dry Dam

Day/date	**:** Tuesday, December 11, 2023
Time	: 09.00 WIB to. finished
Venue	: Sermo Meeting Room 2nd Floor, Dam Engineering Hall Building. Jalan Sapta Taruna Raya, Pasar Jumat PU Complex, South Jakarta
Event	: TECHNICAL DISCUSSION: Preparation for Operation and Maintenance of Sukamahi Dam Dry Dam
Participant	: List Attached

DISCUSSION AND CONCLUSION

A. General:

- Baffle blocks are moved further upstream, don't block the flow of water in the canal and even disrupt the flow because they can block small rocks that should be able to pass too

B. Geology

1. Regional geology: geomorphology must be accompanied by a map
2. Stratigraphy: lithological visualization must be clear from the sequence of breccia, lava and others.
3. Take advantage of existing geological data, don't create new data that deviate from existing data records. The data should be in summary form, and don't even change the data.
4. Structural geology:
   - more focused, don't mix it with other data,
   - Eye mapping plots must be completed and presented more clearly,
   - complete the creation of geological as build drawings,
   - the most recent geological cross-section to be continued.
5. Geological data is incomplete and cannot be assessed.
6. Existing data must be recapitulated.
7. The data used must be the latest data
8. construction materials
   - The existing data is not yet equipped with wet density and dry density, which should be important data,
   - the existing data is good, but the statement is said to be wet. The contradiction between data and reality must be checked and cross-checked.
9. Core Zone Material

- The core material containing minerals is one of the factors that sometimes the water is high as a record of the dam's behavior,

- the core water content is high, so high water pressure impacts the condition of the minerals,
- random stones, in the field more soil. Lu is more than half, and random soil contains a lot of water. causing landslides. so the counterweight was repaired with stone, and the remainder of the stone zone pile was used 'sirtu'. All data should be in BTB.

10. Please make the data processing clearer and more detailed because much of the existing data has not been processed correctly.

Instrumentation

1. Presentation of sliding stake data should be separated from upstream to downstream
2. Isometer

- improving the analysis data and theory used so that the analysis can be better and can be read properly

3. There are 2 new piezometers which were replaced due to damage. and it has worked well.
4. read the final report so that the discussion does not repeat itself and can continue the history of the existence and performance of all tools. so that the data continues instead of being new and creating difficulties.
5. Deposition conditions can be used to calculate dystrophy or damage, incomplete recovery. Current conditions still use residuals for landslide areas for the short term. others can use effective stress. it is necessary to draw the contours of the images as a control.
6. The reading of the existing equipment needs to be confirmed again with the installation vendor because the reading results are found to be out of sync
7. climatology= WTG, wind turbine generator can be installed
8. stability: flood operating patterns
9. All inspections must be reviewed with the latest report so that the history can be recorded properly and is not confusing

Handling of Manikin Dam Access Road Slopes

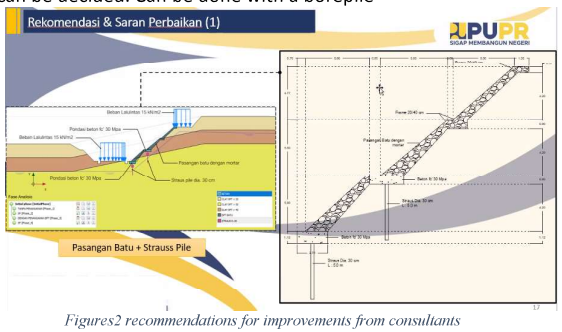
Day/date : Wednesday, December 12, 2023
Time : 09.00 WIB to. finished
Venue : Sermo Meeting Room 2nd Floor, Dam Engineering Hall Building. Jalan Sapta Taruna Raya, Pasar Jumat PU Complex, South Jakarta~zoom meeting
Event : Handling of Manikin Dam Access Road Slopes
Participant : List Attached

DISCUSSION AND CONCLUSION

1) Handling landslides that occurred on road slopes initially used plants, but landslides still occurred, then they were replaced with gabions, but landslides still occurred. The visible condition of the gabions shows that the gabions installed tend to put an additional load on the rock when saturated.

Figures1 landslides that occurred on the slopes of the Manikin Dam road

2) Movement analysis must receive a more in-depth study, after which the appropriate method for handling can be decided. Can be done with a borepile



Figures2 recommendations for improvements from consultants

3) The weak zone is between the boundaries of the Noele and Bobonaro formations, where the water is dominated by water originating from the Noele formation. So it is necessary to carry out a dewatering method between the boundaries of the Noele and Bobonaro formations.

Figures3 results of geoelectric investigations

4) It should be modeled according to field conditions. Apart from that, the parameters used should not be used immediately, engineering judgment is needed by taking smaller lab parameters.

Minutes of the Plenary Session

Date : Monday, April 22, 2024
Time : 09:00 WIB - Finished
Venue : Dam Engineering Hall Meeting Room
Agenda : Discussion and Follow-up on the Technical Session for the Design of the Cijurey Dam

Participants:

1. Members of the Dam Safety Commission
2. Representatives from the Citarum River Regional Office
3. Design Consultants: PT. Sarana Bhuana Jaya, PT. Wecon, PT. Ika Adya Perkasa, PT. Bintang Tirta Pratama KSO

Discussion Summary:

- **Technical Design Review:**
  Initial design proposed a zonal random rock fill dam, but considering Ministerial directives, suggestions were made to explore CFRD (Concrete Faced Rockfill Dam) and RCC (Roller Compacted Concrete) types. Geological investigations revealed the presence of mudstone, marl, sandstone, and marl limestone in the dam area, prompting further consideration for dam types. Recommendations were made to combine certain geological units for simplification and accuracy in geological mapping.
- **Geological and Engineering Geology Review:**
  Suggestions were made to confirm geological formations with field observations and improve the accuracy of geological maps. Additional testing and mapping were suggested to assess potential landslide risks and foundation conditions thoroughly. Mineralogical testing recommendations were accepted to identify expansive properties in core materials.
- **Construction Preparation and Materials Review:**
  Recommendations were made to recalibrate materials volume calculations, conduct detailed soil sampling, and evaluate the suitability of materials from river sediments. Suggestions were accepted to enhance access roads and social assessments for construction areas.
- **Hydrology and Hydraulics Analysis:**
  Rainfall analysis was discussed, and suggestions were made to improve data comparison methods and consider ARF values for rainfall reduction. Recommendations were accepted to refine low-flow discharge analysis methods and assess baseflow conditions.

Action Items:

1. Conduct further design exploration for dam types, considering geological findings.
2. Enhance geological mapping accuracy and conduct additional testing as recommended.
3. Recalculate materials volume and conduct detailed soil sampling for accurate construction planning.
4. Improve access roads and conduct social assessments for construction areas.
5. Refine rainfall analysis methods and consider ARF values for reduction.
6. Evaluate low-flow discharge analysis methods and assess baseflow conditions accurately.

Next Steps:

- Consultants to incorporate recommendations into the revised design proposal.
- Geological and hydrology teams to conduct further investigations and analysis.
- Construction team to prepare detailed plans based on updated recommendations.

Conclusion:
The plenary session concluded with consensus on the necessary steps to address technical recommendations and ensure the comprehensive planning and design of the Cijurey Dam. Further collaboration and coordination among stakeholders were emphasized to achieve project objectives effectively.

Minutes of Meeting

Date : Monday, May 13, 2024
Meeting Agenda : Meninting Dam Pre-Plenary Preparation
Attendees :[List of Attendees]

Impounding Matters:
The condition of the land poses no adverse effects on the surroundings; structures are secure. The embankment materials from the flooded areas, except for fine filters from Lombok Timur, are suitable. The material condition is sufficient.

Action Items:
1. Further testing is required for documentation purposes to ascertain the origin of rocks.
2. Emphasize dam safety, particularly regarding filter and core materials.
3. Re-evaluate the core material's gradation against specifications and field samples.

Instrumentation:
- Decide promptly on wire piezometer placement and distance considerations, and depict pore water pressure. Note ongoing embankment activities for monitoring purposes.

Hydromechanics:
1. Equipment is on-site except for aquators.
2. Follow up on installation; completion expected by late May.
3. Several minor notes need completion and corrections, especially regarding intake towers lacking instrumentation.
4. Adjustments were made to the pipe support length, which was reduced from 8m to 6m.
5. Utilize PLN networks; procure cables for each unit.
6. Lightning rods were prepared but lacking instrumentation from the main dam.
7. Trash booms are ready but await prepared anchors due to time constraints.
8. Newly advised by PLN: all electrical equipment must be accompanied by an operational certificate.
9. Manual lowering of floodgates takes nearly 1 hour, posing a significant risk. Explore additional digital tools for sediment control on booms.

Hydrology:
1. Incomplete compliance with BTB 2022 module; numerous data corrections needed.
2. Insufficient presentation of DTA Meninting dam data affecting AWLR positioning.
3. Rain gauge and used rainfall data are downstream, needing relocation.
4. Use AWLR from the July 2022 overtopping incident for calibration to represent hydrological data.
5. Forecasted impounding conditions based on BMKG data differ from actual downstream AWLR data.
6. Downstream rain posts are inadequate for hydrological data preparation.
7. Review POW water supply data for accuracy and precise calculations.
8. Re-evaluate the early release proposal considering flood conditions.
9. PMF flood analysis discrepancies require further investigation.

Operational Guidelines:
1. Operational patterns remain unclear; RTOW is yet to be drafted.
2. Post-hearing discussions are required.

3. Early release gate construction appears non-functional; evaluate the necessity of early release gates.
4. Include dam break analysis in the RTD.

Geology:

1. Lack of complete morphological maps for Mount Rinjani.
2. Regional geology is comprehensive but lacks dam-passing routes.
3. Concerns arise from nearby active faults, necessitating detailed dynamic analysis.
4. The Dam Column (waduk) map is too narrow for effective analysis; expand and enhance mapping.
5. Small hill formations at the dam's right abutment pose risks; monitor with increased incline.
6. Foundation lens weakness addressed with dental concrete; monitor structure integrity.
7. Geology assessment, grouting, and mapping are incomplete; prioritize completion for treatment.
8. Grout pressures lower than WPT expectations; re-evaluate during impounding.
9. Additional grouting is needed on the right side up to the right abutment.
10. Checkhole procedures should adhere to technical specifications for clarity during inspections.
11. Clearly present lugeon and total grout data graphically.
12. Complete grouting on the right side and continue to the right abutment.

Additional matter for the next meeting needs to be completed

Stability:

1. Await material analysis results.
2. Further, analyze parameters like random soil materials.

Pre-Plenary Meeting Topics for July Impounding:

1. Stability assessment.
2. Impounding planning.
3. Material quality control.
4. Concrete quality control.

Additional Notes:

- Verify impounding materials and summarize embankment parameters for re-evaluation.
- Initiate monitoring of on-site instrument data; confirm data changes, soil pressures, and seepage tendencies.

Next Pre-Plenary Meeting:

Scheduled for the last week of June 2024.

Minutes of Meeting

Date **:** Tuesday, May 14, 2024
Meeting Agenda **:** Keureuto Dam Pre-Plenary Preparation for Impounding
Place : Dam Hall Building
Time : 08.30 WIB- Finised
Attendees **:**[List of Attendees]

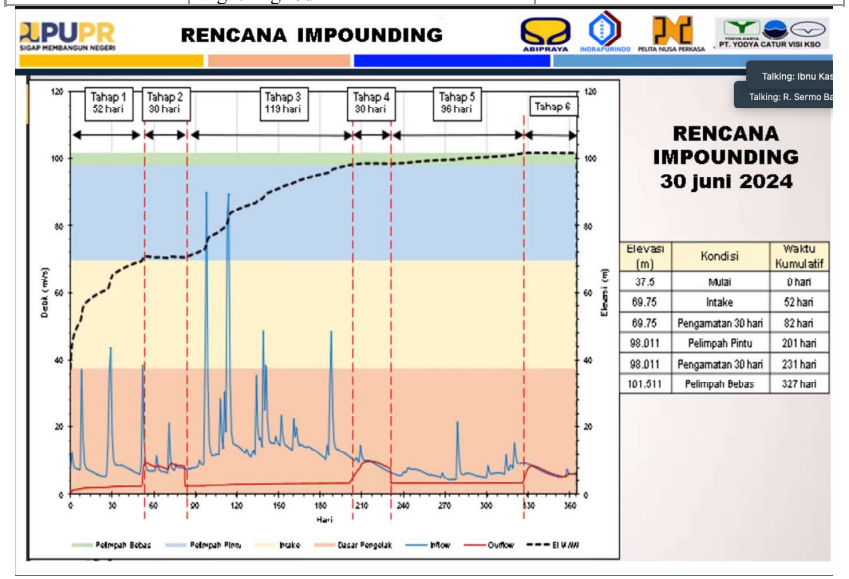
Impounding Matters:
Problem Table for meeting material:

Location	Problem	Completion
Dam Body	The initial design was with a 2 m Rip Rap, while material availability in the field was limited	With static and dynamic SF analysis (makdisi) starting from Berm +64.01 Rip Rap revised 1 m safe.
Instrumentation	The initial design did not have an Open standpipe Pizometer, it was feared that there would be no pores in the long term because Vibrating wire does not last long	Addition of 12 Open Standpipe Pizometers at elv +64.5 (heap at that time) so there is no need for drilling
	Design Vnocth in Elv +..,..is lower than the MA of the river so Back water occurs	With a design review, the elevation of the Vnocth hole was increased.
Evacuation tunnel and waterway	There are many leaks in the concrete tunnel, it is feared that the backfill grouting along the tunnel and the curtain grouting on the main plug will not be successful.	Repairs were made to the grouting along the tunnel and curtain at the main plug

THE REST OF THE MAIN WORK IS UNDER COMPLETION

Location	Problem	Completion
Dam body	Heap up to Elv +87.00 from the planned Elv Peak + 107.51, Less 20.51 m	Volume Disadvantages: Zone 1: 66,571,568 m3 Zone 2: 28,954.112 m3 Zone 3: 27,177,766 m3 Zone 4: 156,501.542 m3 Zone 5: 77,153,316 m3
Hydromechanical	Penstock 150 m of 204 m Bottom Outlet 160 m from 465 m Valve House	Waiting Valve 0.5 m
Instrumentation	Vnotch repair Installed sliding pegs: peak 0 of 18 Hulu 0 of 7	Waiting for the pile

	Downstream 11 of 22 3 Vibrating damaged 2, 4 and 8 Vibrating not installed yet 2 Lightning rod	



Agenda Items:

A. Instrumentation

1. **Data Availability:**
- There is a significant amount of data missing, making comprehensive analysis (such as cross-sectional analysis) challenging.
- Action: Prepare and compile necessary data to facilitate detailed analysis.
2. **Data Preparation:**
- Ensure all data is ready and accessible for ease of analysis.
3. **Seepage Crystalline:**
- There may be contradictions when installing drainage due to seepage issues.
- Action: Conduct mapping and create as-built documentation.
4. **Climatology and AWLR:**
- These systems are not yet installed.
- Action: Expedite the installation process.
5. **Lab Data Completeness:**
- Reassess and document the completeness of laboratory data.
6. **Design vs. As-Built Data:**
- Ensure clarity in comparing design data with as-built data.
7. **Seepage Base Floor Confirmation:**
- Confirm the base floor details to address seepage issues.
8. **Monitoring and Analysis:**
- Continue monitoring and pay close attention to data analysis.

B. Hydrology

1. **Flood Map Observations:**
- Current flood maps indicate moderate flood risks.
2. **Flood Prediction:**
- There remains a significant potential for future flooding.
3. **Reservoir Performance:**
- The reservoir is performing well with existing hydrological data, adequately meeting water needs despite declining water levels without disrupting usage.
4. **Downstream Flood Potential:**
- Matangkuli Subdistrict faces annual overflow risks, necessitating flood reduction measures by the dam.
5. **Flood Scenario Recap:**
- Summarize flood scenarios from consultants to recommend the best option.
6. **Impounding Timing:**
- Impounding in June may lead to significant water increases in November and December, potentially causing floods.
- Action: Avoid early release; focus on impounding closer to December and January.
7. **Early Release Consideration:**
- Evaluate downstream conditions before early water release.
8. **Utilization Potential:**
- Utilization without overflow is deemed good.

C. OP and RTD Guidelines

1. **Dam Collapse Analysis:**
- Use an average tidal range of 0.6 meters for collapse analysis and update RTD accordingly.
2. **Flood Management:**
- Develop updated designs to handle annual flood risks without dam collapse.
3. **Evacuation Procedures:**
- Adjust evacuation procedures to current field conditions.
4. **Communication Flow:**
- Improve internal communication during each alert stage.
5. **Professional Consultation:**
- Seek advice from nearby dam experts for professional adjustments.
6. **BMKG Coordination:**
- Collaborate with BMKG for rain data post-dam collapse.

D. Hydromechanical

1. **Equipment Status:**
- All equipment is on-site and ready for impounding preparations.
2. **Main Butterfly Valve:**

- Ready at location; technical preparations such as crane setup are required.

3. **Drop Inlet Installation:**
- Installation completed, plugged downstream.
4. **Lightning Protection:**
- Yet to be installed.
- Action: Install lightning protection.
5. **Early Warning Systems:**
- Install early warning systems at the site.
6. **Trash Boom Installation:**
- Anchor installation needed at the submerged inlet.
7. **Power Supply:**
- Ensure electrical systems, including 2 emergency generators, are prepared and obtain PLN approval.
8. **Hydromechanical Drawings:**
- Finalize and complete working drawings.
9. **Diversion Gate Manual Operation:**
- Consider using heavy machinery like mobile cranes for efficiency.
10. **Trash Clean-Up:**
- Clean and check for debris in front of the diversion gate to prevent seal damage.

E. Geology

1. **Foundation Repair:**
- Grouting results are positive; verify during impounding.
2. **Backfill and Consolidation:**
- Improvements noted; previous leakages significantly reduced.
3. **Tunnel Seepage:**
- Seepage in concrete segments due to ineffective water stops; conduct grouting and crystalline repairs.
4. **Local Geological Mapping:**
- No dangerous structures, but potential faults detected on the left slope; monitor for seepage risks.
5. **Left Slope Landslide Potential:**
- Recheck to identify causes and address them before impounding.
6. **Weakening Reservoir Supports:**
- Address erosion risks on both sides of the reservoir.
7. **Upfront Spillway Foundation:**
- Implement erosion prevention measures.
8. **Data Finalization:**
- Resolve overlapping data issues for as-built drawings.
9. **Reservoir Column Landslide Potential:**
- Map and assess the area to understand material impact during landslides.
10. **Grouting Data Consistency:**
- Align 2017 grouting data with current data.
11. **Hydrogeology Map Finalization:**
- Finalize as-built hydrogeology maps.
12. **Earthquake Map Consistency:**
- Confirm and finalize seismic maps for stability calculations.
13. **Seismotectonic Mapping:**
- Detailed and clear, essential due to the dam's height and seismic risk.

Critical Action:

- Install Seismic Margin Assessment (SMA) to minimize potential risks.

Conclusion

- All departments are to address their respective action items promptly.
- Follow-up meeting scheduled for after confirmation of readiness about the data to review progress.

Minutes of Meeting

Date **:** Wednesday, May 15, 2024
Meeting Agenda **:** Lausimeme Dam Pre-Plenary Preparation for Impounding
Place : Dam Hall Building
Time : 08.30 WIB- Finished
Attendees **:**[List of Attendees]

1. Impounding Discussion
- **Status:** Inti (core) construction is not yet complete, presenting challenges.
- **Material for Dam Fill:** Routine tests and mineral grading are ongoing. However, field conditions and transport to the lab are causing sample collection issues.
- **Instruments:** Some instruments have not arrived on-site but have been ordered.

2. Quality Control (QC)
- **Seepage:** V-notch has not been implemented. The gravity system is in good condition.
- **Concrete:** The quality control results for capping meet K225 standards. Hammer tests are insufficient; core drilling is required for a thorough assessment.

3. Hydromechanical Issues
- **Intake Tower:** The 42m service bridge's design calculations need to be provided to BTB due to its length and non-suspension type. It is intended for personnel only, not for gate and stoplog tower repairs.
- **Tunnel Maintenance:** Provisions have been installed.
- **Hydromechanical Equipment:** Hollow jet and butterfly valves have yet to arrive but are scheduled for factory inspection and testing.
- **Readiness:** Other hydromechanical equipment is ready.
- **Flow Meter:** Needs to be prepared to measure raw water flow rates.
- **Valve House:** Prepared and equipped with a large crane as required.
- **Lightning Protection:** Two units have been installed; additional units are needed due to separate areas.
- **Early Release System:** Installed and awaiting finishing touches.
- **Emergency Generator:** Ready along with the daily fuel tank.

4. Hydrology
- **Rating Curve:** Re-checking and revising the rating curve at the cofferdam; current readings indicate low discharge rates, requiring updates with conduit data.
- **Flood Management:** Effective in redirecting Dili River flow to Percut River, reducing flood discharge. The theoretical 4m reservoir water level reduction within one day needs a 1m/day operational safety limit clarification.
- **Impounding:** Estimated to take three months; monitoring is crucial during this period.
- **Instrumentation:** Install AWLR upstream and ARR in the watershed before impounding.
- **Data Update:** Use the latest data, not just design data.
- **Sedimentation:** Provide updated sedimentation and erosion maps.
- **Water Quality:** Use initial samples to develop operation and maintenance guidelines and continue data collection for graphical analysis.

5. Operation (OP) and Real-Time Data (RTD)
- **Documentation:** Five chapters are ready, but improvements are needed.
- **Organization:** Staff positions are yet to be filled.
- **Equipment:** Ensure all required OP equipment is available during the preparation period.

6. Geology
- **Crack Prevention:** Consider adding anchors to prevent landslides, with a pre-determined calculation for the number needed.
- **Crack Mapping:** Mandatory data mapping.
- **Seepage Control:** Direct flow diversion strategies.
- **Slope Safety:** Conduct a study for securing the left slope below the facility buildings.
- **Reservoir Area Safety:** Requires study and implementation of safety measures.
- **Downstream Springs:** Effective proposed handling via downstream piping.

7. Instrumentation
- **Lab Results:** No results meeting standards yet, preventing stability analysis.
- **Flooding Method:** Cannot be discussed until field conditions are clarified.

Minutes of Meeting

Date : Thursday, May 30, 2024
Topic : Technical Certification Session for operation and maintenance of the Sadawarna Dam
Participants : [listed]

Hydrology

1. **Flood Event in February 2024:**
- The water capacity analysis indicates that the flood cannot be classified as a major flood. The water level remained below the normal water level, suggesting it was not due to overflow.
2. **Early Release Gates:**
- The early release gates were intended to reduce downstream flooding. However, due to misalignment with the gate guard system, these gates were used to maintain the Probable Maximum Flood (PMF) level instead.
3. **Early Warning System Proposal:**
- The confirmation and completion of the early warning system and its equipment need to be addressed to ensure clarity and reliability of the system.
4. **Landslide Prone Areas:**
- Several landslide-prone points need to be studied by the geotechnical team. This study will provide inputs regarding inflow and outflow permissions for the current dam conditions.
5. **Flood Control Model:**
- The alternative of lowering the normal water level for flood control should be considered for recommendations.
6. **Early Warning System Installation:**
- It needs to be determined as soon as possible whether the early warning system should be installed.

Hydromechanical Operations

1. **Current Operations:**
- The operations are running well.
2. **Technical Assistant Concerns:**
- The hydromechanical technical assistant has some uncertainties that need to be addressed.
3. **Discharge Structure:**
- There is a need to decide whether to use a hollow jet or other discharge structures.
4. **Sadawarna Tunnels:**
- Sadawarna has two tunnels. One is a diversion tunnel utilized as a bottom outlet. There is uncertainty regarding the number of bottom outlets required, as the functional status is not yet clear.
5. **Generator Set:**
- The generator set is ready for early release and irrigation gate operations, but fuel supply requires special attention.
6. **Energy Sources:**
- The existing PLTMH and PLTM energy sources must have a System Load Operation (SLO), as it is mandatory.
7. **Lightning Protection:**
- At least two lightning arresters should be installed at the main dam.
8. **Downstream Early Warning:**
- Sirens should be installed downstream to alert the local community in case of an early release.
9. **Trash Boom:**
- A trash boom should be installed to manage debris and prevent blockages caused by waste.
10. **As-Built Drawings:**
- The completion of as-built drawings is necessary.

OP RTD

1. **Power of Water (POW):**
- This item has not been addressed yet.
2. **Operational Communication:**
- There is a need to expand and build the communication network for operations.

Next Steps:

- Will be held pre-plenary for the next 2 weeks to complete the data.

Minutes of Meeting

Project : Manikin Dam Design Review
Date : June 3, 2024

---

1. Design Changes for Manikin Dam

Structural Stability:

- Focus on enhancing the stability of the structure.

Hydrology:

1. **Accurate Hydrological Calculations:**
    - Re-evaluate hydrological calculations post-Seroja incident. Current results are inconsistent with nearby stations.
2. **Additional Calculations:**
    - Perform calibration calculations using consistent hydrographs and include corresponding diagrams.
3. **Impact on Downstream Areas:**
    - Identify the reservoir's influence on downstream areas to assess potential hazard risks.
4. **Spillway Landscaping:**
    - Landscape the already excavated spillway by backfilling as necessary to avoid continuation due to safety concerns.
5. **Importance of Hydrological Data:**
    - Emphasize the necessity of comprehensive hydrological data to inform all design aspects of the dam construction.
6. **Design Sufficiency:**
    - Current design appears adequate; re-evaluate areas of concern to confirm stability.

Spillway Evaluation:

- Awaiting results from the construction team's evaluation to review parameters from the laboratory, which are pending.

Capacity Calculations for Spillway:

1. **Post-Calculation Verification:**
    - Verify spillway capacity after initial calculations.
2. **Triple-Check System:**
    - Conduct checks in three locations within a single flow system.
3. **Model Test Verification:**
    - Ensure calculations are verified through model testing.

Preparations for Impoundment:

- Continue preparations with POW (Power of Water) and RTD (Ready to Deploy) plans.

Right Slope Protection:

- Protect the right slope spillway, already excavated, due to potential landslide risk with 14 berms. Reallocate conduit budget for landscaping to save costs.

Hydromechanical Systems:

1. **Bottom Outlet:**
    - Begin designing as per discussions. Ensure readiness against equipment malfunctions using a 440 mm diameter. Consider using steel instead of PVC for material consistency.
2. **Installation Progress:**
    - Several upstream and downstream equipment installed; middle section installations are pending and need to be expedited.
3. **Diversion Gate:**
    - Ensure the availability of the diversion gate to prepare for impoundment.

Embankment:

1. **Chemical Composition of Rock Ash:**
    - Test results available for discussion and approval.
2. **Plinth Design:**
    - Confirm designs and diagrams align with standards.
3. **Earth Core Dam Construction:**
    - Recommend a minimum thickness of 3 meters for dams in high seismic areas to ensure stability.

Next Steps:

- Review and update hydrological data.
- Finalize spillway landscaping and protection plans.
- Expedite installation of middle section hydromechanical systems.
- Confirm diversion gate readiness.
- Approve chemical composition results and finalize plinth design.
- Ensure compliance with seismic stability recommendations for the dam.

Minutes of Meeting

Bendo Dam

Day / Date : Wednesday, 12th June 2024
Location : Bendo Dam
Time : 09.00 WIB – Finished
Event : Plenary Session on Bendo Dam

General Information

The construction of Bendo Dam commenced in 2013 and was completed in early 2021. The initial impounding process began in July 2021.

Discussion Points and Recommendations

1. **Seepage at V-Notch and Right Abutment**
   - Observations show leaks around the V-notch and on the right abutment of the dam.
   - Action Required: A detailed analysis of seepage conditions supported by data needs to be conducted. It is also necessary to determine whether this seepage poses a safety risk to the dam structure.
   -
   -

Figure 1: Seepage near V-notch.

2. **Sortcrete Damage Around the Intake Building**
   - Damage to sortcrete was identified around the intake building.
   - Action Required: Immediate repair work is necessary to address the sortcrete damage.
3. **Seepage in Tunnel Joint Structure and Crown**
   - Observations indicate seepage at the joint structure inside the tunnel as well as at the tunnel crown.
   - Action Required: A thorough inspection and repair plan need to be implemented to mitigate seepage.
   -

Figure 2: Water leakage at tunnel.

4. **Non-Functioning Monitoring Instruments**
   - Instruments such as the inclinometer and multilayer settlement at the riverbed and right bank are not operational. Additionally, the SMA is also non-functional.
   - Action Required:
     - Develop a strategy to address the malfunctioning monitoring instruments.
     - Formulate a contingency plan for the operation team in the event of an earthquake.

TECHNICAL DISCUSSION MINUTE
DISCUSSION OF WATER TREATMENT PLANT (WTP) DESIGN
SEMOI SEPAKU DAM, PENAJAJ PASER UTARA DISTRICT,
EAST KALIMANTAN PROVINCE

Day/Date : Friday, June 14, 2024
Time : 09.00 WIB – finished
Venue : Nakan Dam Meeting Room, 2nd Floor, Dam Hall Building,
i. Jl. Sapta Taruna Raya Public Works Complex Pasar Jumat
ii. Via video conference (Zoom)
Event : Design Discussion *Water Treatment Plan*(WTP) Sepaku Semoi Dam, North Penajam Paser Regency, East Kalimantan Province
Discussion Leader : Duki Malindo, ST, MCM

I. The discussion was attended by:

1) Dr. Ir. Bambang Hargono, Dipl.HE., M.Eng.
2) Dr. Ir. Aries F. Firman, M.Sc., MBA.
3) Ir. Tri Bayu Adji, MA.
4) Dr. Paulus Kurniawan, MBA.
5) Director of Dams and Lakes, Directorate General of Water Resources
6) Director of Water Resources Technical Development, Directorate General of Water Resources
7) Director of Drinking Water, Directorate General of Human Settlements
8) Director of Settlement and Housing Engineering Development, Directorate General of Human Settlements
9) Director of Global Development Cooperation Department K-Water
10) Head of the East Kalimantan Regional Settlement Infrastructure Center, Directorate General of Human Settlements
11) Head of Kalimantan River Region IV, Directorate General of Water Resources
12) Head of Subdirectorate Region I, Directorate of Operations and Maintenance
13) Head of Subdirectorate Region I, Directorate of Dams and Lakes
14) Head of the Sub-directorate of Technical Planning for Dams and Lakes, Directorate of Dams and Lakes
15) Head of Dam Studies Section, Dam Engineering Center
16) Kunhwa E&C
17) Ir. Sri Hetty Susantin, M.Eng
18) Ir. Zainuddin, ME
19) Dam Engineering Center Study Team - Sepaku Semoi Dam
    - Gemma Galgani Tunjung Dewandaru, ST
    - Aghia Aghniafina, ST
    - Muhammad Givi, ST

    (Attachment attendance list)

II. Conclusions and recommendations:

A. General

The Sepaku Semoi Dam was built on the Tengin River, Sepaku III Village, Sepaku Semoi District, North Penajam Paser Regency, East Kalimantan Province.

The dam type is homogeneous earth fill with vertical drainage. The height of the dam from the bottom of the deepest foundation excavation is 22.20 m, the peak width is 6 m, and the length of the dam peak is 450 m, with an effective storage volume of 17.73 million m^3. The slope of the upstream slope is 1: 3.5, and the slope of the downstream slope is 1: 3.0. The main benefits of this dam are Q50 flood control of 231.81 m^3/s (55.26%) and provision of raw water of 2.53 m^3/s.

In order to build facilities to support the benefits of providing raw water from the Sepaku Semoi Dam, on June 14, 2024, a Technical Discussion was held to discuss the Design of a Water Treatment Plant with a planned area of 4 hectares and a planned expansion to 7.2 hectares. The water withdrawal method for the WTP is carried out by pumping reservoir water and flowing to the WTP. The Water Treatment Plan (WTP) planner is K-Water, Korea. The technical discussion resulted in the following conclusions and suggestions:

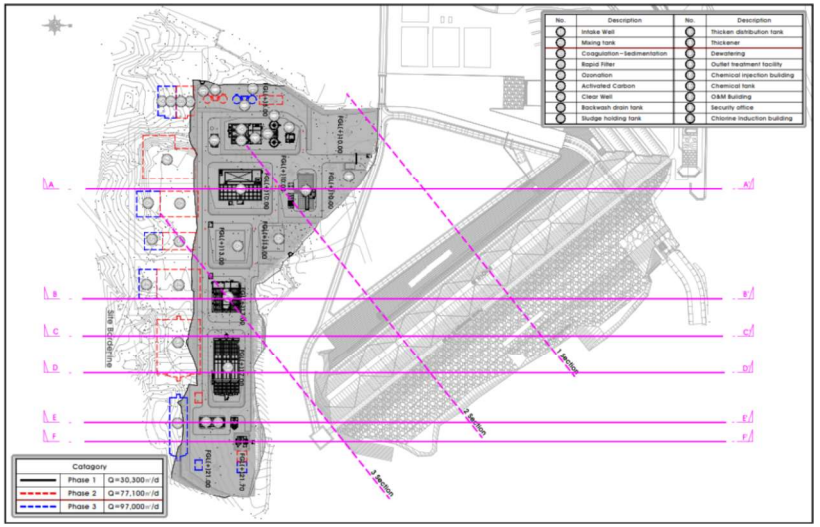
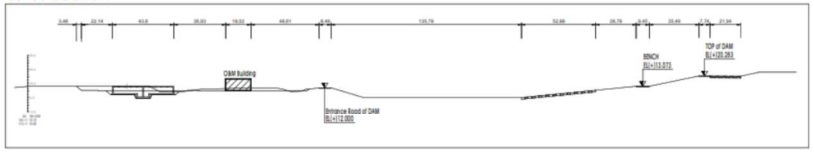
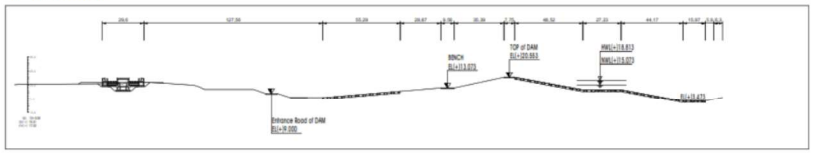


Figure 1. Water Treatment Plan (WTP) Design Layout Map for Sepaku Semoi Dam

A–A' Section



B–B' Section



C–C' Section

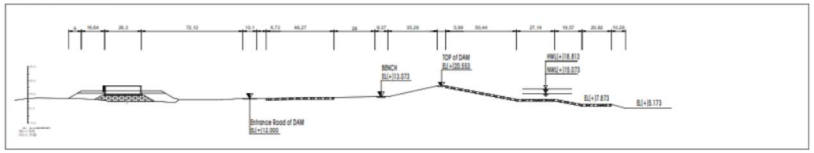
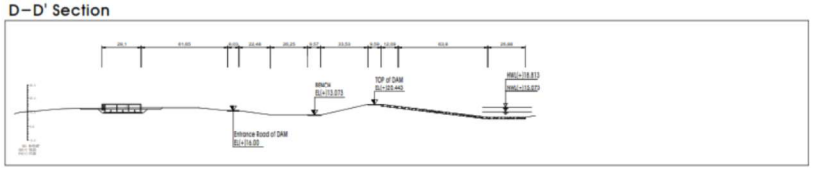
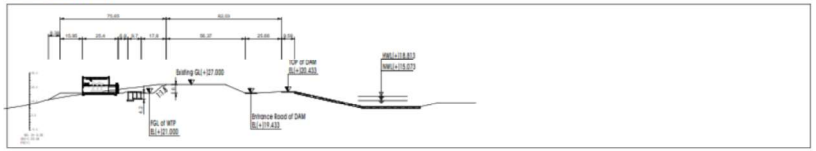


Figure 2.WTP Design for Sepaku Semoi Dam Cuts A - A', B - B', and C - C'

D–D' Section



E–E' Section



F–F' Section

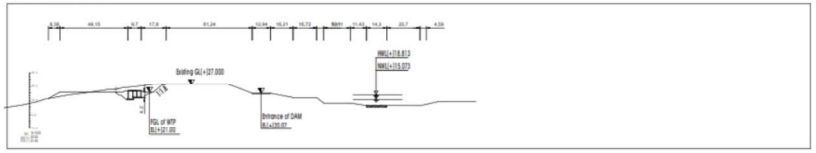
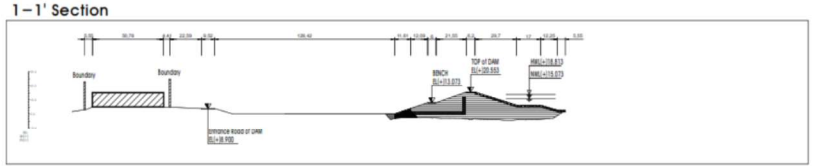
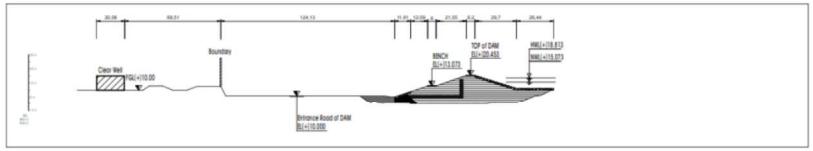


Figure 3.WTP Design for Sepaku Semoi Dam Cuts D - D', E - E', and F - F'

1–1' Section



2–2' Section



3–3' Section

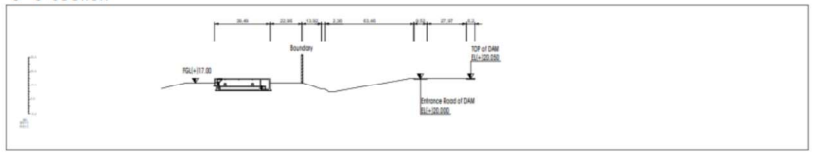


Figure 4. WTP Design for Sepaku Semoi Dam Cuts 1 - 1', 2 - 2', and 3 - 3'

B. Location of Water Treatment Plant (WTP)

1. The design layout map for the Sepaku Semoi Dam WTP has been submitted (Figure 1), and its sections are (Figure 2, Figure 3, Figure 4).
   a. It appears that the layout map and the cut do not match. For example, in the E-E' cut, there are circular buildings on the layout map that are not depicted on the cut. According to the Consultant, this is because these buildings were planned to be built after the WTP was operational (Phase 2 & 3). It should be noted that these buildings will later become a burden that can affect the safety of the dam, so they need to be completely depicted on the layout and cross-section map and taken into account in the stability analysis.
   b. The cut image should also be equipped with a numbering symbol that is adjusted to the layout image. (see Figure 5).

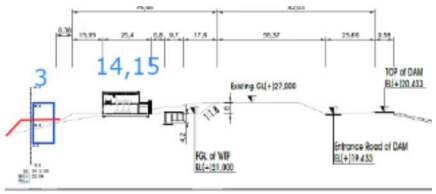
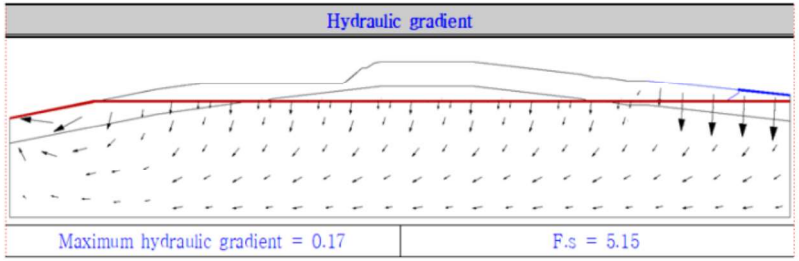


Figure 5. Example of Numbering Symbols on Pieces E-E'

   c. In the description table, symbols number 14 and 15 are in the form of a chemical injection building and a chemical tank, but the Consultant stated that it is only one

building. The image should be corrected.

2. From the answers to the follow-up technical discussion on May 14, 2024, K-water said that the results of the stability analysis carried out concluded that the WTP construction that would be carried out did not affect the safety of the Sepaku Semoi dam.



Category	Specific Gravity (Gs)	Void Ratio (e)	Maximum Hydraulic Gradient (imax)	Critical Hydraulic Gradient (i_c)	i_c/ i_{max}
Case. 2	2.616	0.85	0.17	0.88	5.15

• Critical Hydraulic gradient : $i_c = \frac{\gamma_{sub}}{\gamma_w} = \frac{G_s - 1}{1+e} = 0.88$

• Specific Gravity(Gs) , Dry Unit Weight(γ_d) and Void Ratio(e) apply indoor test results

From the safety analysis of piping, it is explained that an analysis was carried out, which produced a value of Fs = 5.15. However, the hydraulic gradient image being analyzed is not complete

3.

4. Below is the planning layout for the Water Treatment Plant (WTP) on the left side of the Sepaku Semoi Dam.
   a. To facilitate the evaluation of WTP designs, design drawings should be drawn at a normal scale of 1:1 for vertical and horizontal comparisons and equipped with distances and dimensions.
   b. The WTP is designed to be on the left abutment of the dam, with the distance between the mixing tank (nearest building) to the body of the Sepaku Semoi dam being±50 m, and the mixing tank depth is 3.8 m. This distance is considered too close to the dam body, which is feared could compromise the safety of the dam. Apart from that, the left support appears to be a thin hill. For this reason, consider shifting the overall WTP further downstream to ensure it does not affect dam safety. In determining the location of the WTP, you should coordinate with the Kalimantan IV River Regional Office as the Dam Manager.

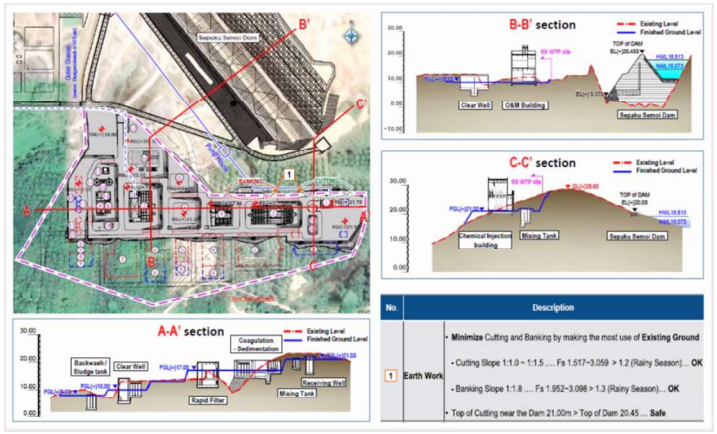


Figure 2. Layout of WTP Plan and Deductions A-A', B-B' and C-C'

   c. In designing the distance of the WTP to the dam body, a seepage analysis should be carried out to ensure the safety of the dam against piping or reed erosion.
   d. In designing the distance of the WTP to the dam body, it should be ensured that it does not interfere with future dam operation and maintenance activities, one of which is the need to maneuver heavy equipment if maintenance or rehabilitation is to be carried out on the dam.
   e. To optimize operational costs for using reservoir water to provide raw water in the future, consider designing the WTP by minimizing the need for pumps and prioritizing the possibility of flowing water by gravity.

5. The WTP is designed to be on the left abutment of the dam, which is a thin hill with geological conditions in the form of silty clay, which is slack and has the potential to experience erosion/landslides if exposed for too long. In implementing WTP construction, you should pay attention to the potential for landslides that could occur during excavation work. For this reason, excavation should be carried out in stages, followed by treatment as soon as possible.

6. The following is Figure 4 and the results of the slope stability analysis of the excavation plan in the Sepaku Semoi Dam WTP planning.
   a. In the analysis of the slope stability of the excavation plan, it can be seen that the safety factor values obtained are relatively small during the rainy season and during seismic conditions. Detailed calculations for each condition should be provided, both for the stability of the excavation slope and the stability of the embankment slope.
   b. If the WTP is designed close to the dam body, which is feared to be dangerous to the stability of the dam, dam stability analysis should be carried out by adapting the standards applicable to dams in Indonesia, namely based on effective stress conditions and carried out under several loading conditions including rapid drawdown conditions. Meanwhile, if the WTP is shifted further downstream so that there is no fear of disrupting the safety of the dam, discussions on the WTP design can be continued with the Kalimantan IV River Basin Center as the Dam Manager only, and do not require a recommendation from the Dam Safety Commission.

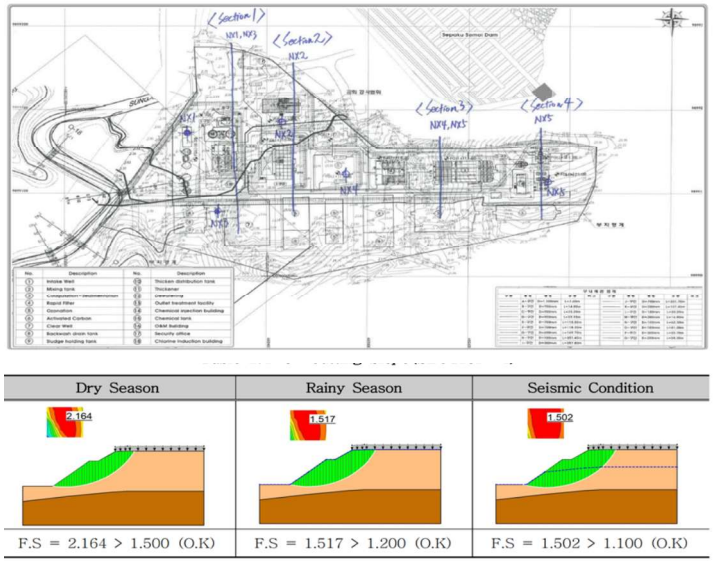


Figure 3. Results of Slope Stability Analysis on Section 4 of the WTP Plan

c. Analysis needs to be carried out in accordance with actual conditions in the field. For this reason, the engineering parameters (engineering properties) used in the analysis should be based on field tests, and the depiction of the groundwater phreatic line used in the analysis should be presented based on assumptions about normal water conditions, bearing in mind that data regarding the amount of water pressure was not obtained at the time of design. pores in the field are used to delineate the phreatic line.

Figure 4. Aerial Photo of the Condition of the Left Support of the Sepaku Semoi Dam

7. In designing the Sepaku Semoi Dam WTP, the consultant should consider the technical suggestions mentioned above and suggestions from the Directorate General of Human Settlements which recommends that the position of the prospective WTP be placed further downstream, far from the dam.
8. The suggestions above should be considered and followed up. The Dam Engineering Office is waiting for the follow-up results from today's discussion so that it can be discussed with the Dam Safety Commission if necessary.

Jakarta, 14 June 2024
Discussion leader,
Pls. Head of the Dam Engineering Center
As Secretary of the Dam Safety Commission

Anissa Mayangsari, ST, M. PSDA
NIP 198110062006042003

Minutes of Meeting

Date : Wednesday, June 19, 2024
Location : Dam Hall Meeting Room
Attendees : listed
Subject : Pre-Plenary Session of Sadawarna Dam (Discussion on Slope Stabilization, Cliff Protection, and Reservoir Monitoring)

1. Slope Stabilization in Class D Areas
- **Discussion:** The potential for landslides in Class D slope areas was addressed. It was noted that side scouring at the identified location is a significant concern.
- **Action Items:**
  - Implement slope-sloping techniques to reduce landslide potential.
  - Provide cliff protection measures at the affected locations to mitigate side-scouring risks.

2. Design of Protective Gabions on Cliffs
- **Discussion:** The design criteria for protective gabions on cliffs were reviewed. The design must accommodate hydraulic and geotechnical strength requirements.
- **Action Items:**
  - Design gabions with consideration for both hydraulic and geotechnical forces.
  - Utilise anchors for additional reinforcement where necessary.

3. Reservoir Water Level Monitoring
- **Discussion:** Continuous monitoring of the reservoir's water levels at both the lowest and highest points is critical. Seepage behaviour must be assessed to ensure dam safety.
- **Action Items:**
  - Establish a regular monitoring schedule for reservoir water levels.
  - Ensure that seepage behaviour remains within safe limits for the dam.

4. Counterweight Addition for Dam Stability
- **Discussion:** In early 2023, the reservoir water level reached +83 meters (close to NWL), causing seepage downstream of the dam body. A counterweight was added to enhance stability.
- **Action Items:**
  - Provide a detailed justification for the addition of the counterweight.
  - Document and review the effectiveness of the counterweight in stabilising the dam.

5. Fault Handling and Monitoring Instruments
- **Discussion:** Detailed information on fault handling and the instruments used for monitoring, focusing on seepage and pressure monitoring, was requested.
- **Action Items:**
  - Present a comprehensive report on the work conducted on the fault.
  - Include historical data and details on seepage and pressure monitoring instruments.

6. Reservoir Trend Analysis and Pore Pressure Sensitivity
- **Discussion:** The reservoir has shown a downward trend twice. It is crucial to be vigilant about a potential upward trend. Information must be communicated to UPB regarding the factor of safety (FK) against pore pressure, particularly if FK falls below specifications.
- **Action Items:**
  - Conduct a sensitivity analysis of FK against pore pressure.
  - Inform UPB if pore pressures result in FK below the specified threshold, and recommend reducing the reservoir water level as necessary.

Next Steps
- Schedule follow-up meetings to review progress on action items.
- Ensure all action items are assigned to appropriate team members and deadlines are set.

Meeting Adjourned at: [not fixed yet]

Minutes of Meeting

Date/Time :Tuesday, June 25, 2024/09:00 AM WIB - Completion
Location :Sermo Meeting Room, 2nd Floor, Dam Engineering Center Building Sapta Taruna Raya Street, PU Pasar Jum'at Complex, South Jakarta
Event :Discussion on the Implementation of Budong-Budong Dam Construction, Mamuju Tengah Regency, West Sulawesi Province
Attendees :[List of participants]

General Overview

- The meeting addressed key technical challenges and project progress updates related to the construction of the Budong Budong Dam. The focus was primarily on the foundation conditions, geological uncertainties, material issues, and construction sequencing.

Key Issues and Detailed Explanations

1. **Foundation Issues**:
   - **Problem**: The dam's foundation consists of deep alluvium deposits (25-30 meters), which could delay construction significantly if all of it were to be excavated. Furthermore, drainage challenges are expected during this process.
   - **Proposed Solution**: A *cut-off wall* was discussed as an alternative to minimize excavation. This would involve creating a barrier within the foundation to reduce seepage and enhance stability. However, further evaluation and input from the KKB team are required.
2. **Alluvium Thickness Confirmation**:
   - **Current Status**: Drilling is ongoing to confirm the actual thickness of the alluvial deposits. The initial design estimates it to be around 20-25 meters, but this needs validation to proceed with construction planning.
3. **Riverbed Material Quality**:
   - **Requirement**: The size, type, and matrix composition of the riverbed material need to be thoroughly assessed.
   - **Action**: Upstream material samples should be analyzed to ensure the selected cut-off method and equipment are appropriate for the conditions.
4. **Liquefaction Risks**:
   - **Concern**: At the design stage, liquefaction risks were identified. To mitigate this, it was suggested to excavate all alluvium.
   - **Explanation**: Liquefaction occurs when saturated soils lose strength due to seismic activity or heavy loads, potentially destabilizing the structure. Removing the alluvium could eliminate this risk, albeit at the cost of increased time and resources.
5. **Mineralogy of Foundation Rock**:
   - **Reason for Testing**: The mineralogical composition of the foundation rock affects the type of cement required for construction.
   - **Specific Concern**: If the rock contains many amorphous minerals, it may react poorly with alkali-based cement, necessitating the use of non-alkali cement to ensure durability and safety.
6. **Zone 4 and Zone 5 Management**:
   - **Requirement**: Zone 4 (construction material) must be entirely covered by Zone 5 to maintain structural integrity.
   - **Observation**: The reserve analysis shows that Zone 5 materials have a ratio of 3, which is sufficient for the covering process.

Construction Progress and Challenges

7. **Land Acquisition and Soil Composition**:
   - **Challenge**: Delays are primarily due to unresolved land acquisition issues.
   - **Soil Type**: The foundation soil transitions from sandy gravel to alluvial deposits, complicating construction processes due to inconsistent properties.
8. **Drilling Challenges**:
   - **Current Status**: Drilling operations at the riverbed are hampered by heavy rainfall, which has submerged machinery and delayed progress. Results from completed drilling are pending analysis.
   - **Impact**: Without accurate drilling data, it is challenging to confirm foundation stability and proceed with key construction activities.
9. **Geological Data Limitations**:
   - **Problem**: Geological data collected thus far is insufficient for comprehensive analysis, leading to uncertainties in construction sequencing.
   - **Planned Action**: Efforts are underway to complete geological data collection by August, focusing on critical areas such as mineral composition and stratigraphy.
10. **Diversion and Cofferdam Construction**:
    - **Current Status**: The diversion process, initially planned for earlier phases, is now scheduled for September. The cofferdam, essential for redirecting water flow during construction, has yet to be constructed.
    - **Explanation**: The delay in diversion affects other construction activities, as many require a dry working environment.
11. **Material and Measurement Clarification**:
    - **Need for Accuracy**: Measurement data, such as material dimensions and sources, must be rechecked and validated. Incorrect or incomplete data can lead to construction errors.
    - **Action**: Replacement materials and accurate measurement testing must be prioritized to ensure compatibility with design specifications.
12. **Tunnel Construction Data**:
    - **Current Issue**: Data on tunnel construction is incomplete, particularly regarding boulder composition and degradation rates. This prevents detailed analysis and proper material selection.
    - **Plan**: Additional tests and analyses will be conducted post-diversion to address these gaps.
13. **Parallel Drilling Operations**:
    - **Solution**: Parallel drilling has been proposed to accelerate progress and address delays caused by equipment submersion.
14. **Cross-Section Clarity**:
    - **Problem**: Current cross-section illustrations lack clarity and detail, making it difficult to align the construction process with design parameters.

- **Recommendation**: Updated and detailed cross-sections should be prepared to ensure consistency between design and implementation.

Action Plan

15. **Foundation Stability**:
    - Confirm alluvium thickness through ongoing drilling and determine the feasibility of a cut-off wall based on KKB team input.
16. **Material Testing**:
    - Conduct mineralogical tests on foundation rock to finalize cement type.
    - Analyze upstream riverbed material for size, type, and matrix details.
17. **Expedite Data Collection**:
    - Focus on completing geological data by August to address uncertainties in construction sequencing and tunnel design.
18. **Diversion Planning**:
    - Prioritize the cofferdam and diversion process to allow dry working conditions for further construction activities.
19. **Update Designs**:
    - Provide detailed and accurate cross-section illustrations to guide construction teams effectively.
20. **Address Land Acquisition Delays**:
    - Engage stakeholders to resolve land acquisition issues promptly and avoid further delays.
21. **Parallel Drilling Execution**:
    - Deploy parallel drilling teams to recover lost time and ensure critical milestones are met.

- This detailed record provides a comprehensive understanding of the discussions, challenges, and actions required for the Budong Budong Dam construction. Further meetings will be held to monitor progress and address emerging issues.

Minutes of Meeting

Date/Time :Thursday, 27 June 2024, /09:00 AM WIB **-** Completion
Location :Sermo Meeting Room, 2nd Floor, Dam Engineering Center Building Sapta Taruna Raya Street, PU Pasar Jum'at Complex, South Jakarta
Event :Discussion on the Implementation of Leuwikeris
Attendees :[Attached]

1. **Seepage Issue**: There are major problems with seepage and leaks at the joints. Please measure the quantity and address it with grouting. The results should be reported to OP to determine how to rehabilitate it. Clear data is necessary to monitor before and after, even post-impounding, to understand the effectiveness of the grouting.
2. **Earthquake Analysis and Report**: The analysis and reports on the recent earthquake are incomplete, especially regarding the Strong Motion Analysis (SMA). Reports on the impact of the earthquake indicate that the equipment has just arrived and is still in Jakarta.
3. **Recommendation**: Install the monitoring equipment downstream as soon as possible to ensure earthquake control measures are in place.
4. **V-Notch Functionality**: The V-notch is functioning as a temporary control measure while waiting for the SMA equipment.

Impounding Plan

- The impounding process will begin with the closure of TP2, followed by plugging at the end of September.

Hydromechanics

- Some components and equipment are still being procured. PLEASE PREPARE THESE AS SOON AS POSSIBLE TO SUPPORT THE IMPOUNDING.

Action Items:

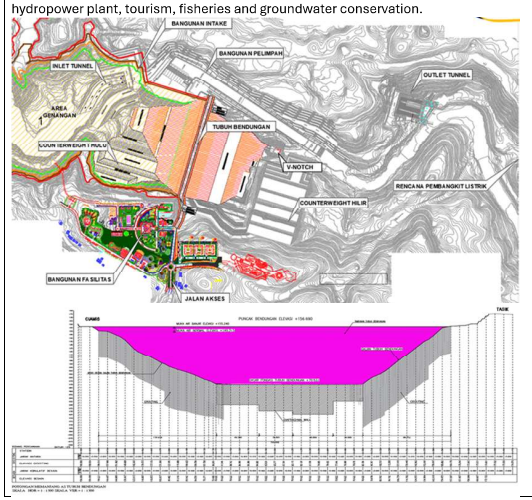
1. Measure and report seepage issues and grouting results to OP.
2. Complete and update the earthquake analysis and report with the SMA data.
3. Install earthquake monitoring equipment downstream immediately.
4. Ensure all hydromechanical components and equipment are ready to support the impounding process.

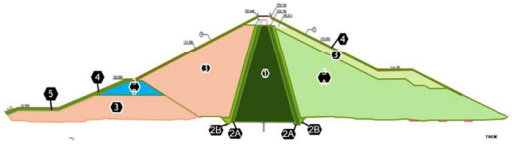
CHAPTER II
FOLLOW-UP STUDY OF THE MINUTES OF THE KKB TECHNICAL ASSEMBLY AND KKB PRE-PLENO DISCUSSIONS

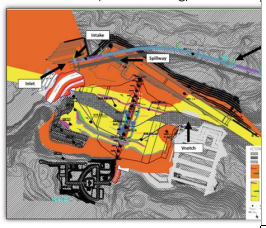
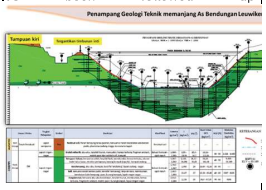
2.1. General

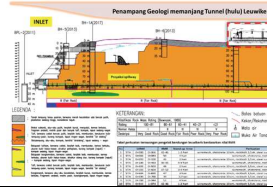
In order to discuss the Construction Implementation and Preparation for the Initial Filling of the Leuwikeris Dam Reservoir, a KKB Technical Session was held on April 1, 2024 and a KKB Pre-Plenary Technical Discussion on June 6, 2024. The results of the Dam Engineering Hall's study of the follow-up report are described in the sub-chapter below.

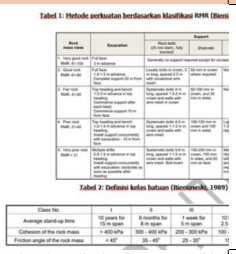
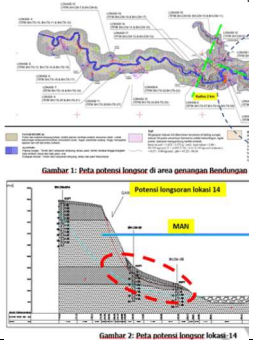
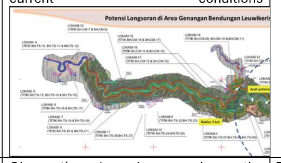
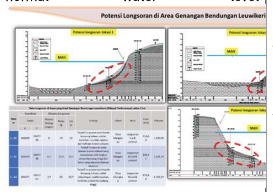
2.2. Follow-up Study of Pre-Plenary Technical Discussion Minutes 6 June 2024

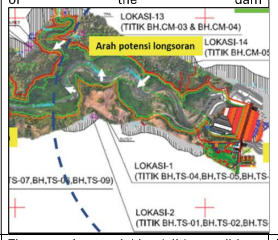
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	A. Umum		
	The Leuwikeris Dam is being built on the Citanduy River, located in two districts, namely Tasikmalaya Regency and Ciamis Regency, West Java Province. On the left side of the river is the area of Handapherang Village, Cijeungjing District, Ciamis Regency, and on the right side of the river is the area of Ancol Village, Cineam District, Tasikmalaya Regency. Geographically, the dam work location area is located at coordinates 108° 23' 43" East Longitude and 7° 21' 42" South Latitude. The dam type is a zonal random rock fill with an upright core, with a maximum height of 84.90 m measured from the deepest base of the foundation. The length of the dam peak is 409.09 m and the width is 14.50 m. The upstream slope is 1: 2.50 and the downstream slope is 1: 2.50. The gross storage volume is 81.44 million m^3. The benefit of the dam is to provide irrigation water for rice fields in D.I. North Lakbok covers an area of 6,600 Ha and D.I. Manganti covering an area of 4,616 hectares, raw water for Banjar City, Tasikmalaya Regency and Ciamis Regency amounting to 0.845 m^3/s, flood control, 2 x 10 MW hydropower plant, tourism, fisheries and groundwater conservation. 		

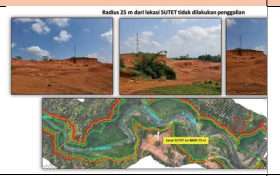
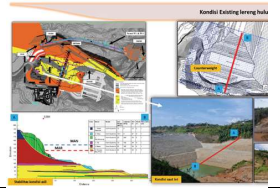
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	 Zona | Volume Pekerjaan Timbunan 1 | Timbunan Zona 1 | 748.088,52 2A | Timbunan zona 2A (Filter Halus) | 174.584,11 2B | Timbunan Zona 2B (Filter Kasar) | 110.584,11 3 | Timbunan Zona 3 (Quarry) | 2.548.826,40 3a | Timbunan Zona 3a (random) | 1.788.608,72 3b | Timbunan Zona 3b (Aluvial) | 241.922,97 4 | Timbunan Zona 4 (Rip-Rap) | 180.716,79 5 | Timbunan Zona 5 (blanked) | 40.454,13 In actual construction implementation, the overall physical progress of the Leuwikeris Dam as of May 28, 2024 has reached 97.09%. The remaining major milestones are dam body works, intake building works, hydromechanical works and tunnel plugging. The initial filling of the reservoir is planned to be carried out in August 2024. On June 6, 2024, a Technical Discussion was held by the Dam Safety Commission, discussing Construction Implementation and Preparation for Initial Filling of the Leuwikeris Dam Reservoir, Ciamis Regency and Tasikmalaya Regency, West Java Province. The technical discussion resulted in the following suggestions.		
	B. Dokumen Persyaratan Pengajuan Izin Pengisian Awai Waduk		
1	In the framework of the application process for initial filling of the reservoir, the Citanduy River Regional Office has submitted several administrative and technical requirements documents. In accordance with the SE Minister of PUPR No.1 of 2019 concerning Guidelines for Initial Filling of Reservoirs, this document should be accompanied by:		
	a. Administrative Requirements 1. Application for Reservoir Initial Filling Permit	available	Not submitted yet. The application letter for permission to fill the initial reservoir should be immediately submitted to BTB.
	a. Technical Requirements 1. Construction Implementation Report, which is equipped with explanations regarding geological and engineering geological conditions, foundation repair work, instrumentation work, construction quality testing work, hydromechanical work, etc. 2. Implementation Report on Reservoir Inundation Area Preparation	available	Not submitted yet. The final report on construction implementation (completion report) should be finalized and submitted to BTB.
	d. Follow-up reports on discussion minutes and inspection reports, including: 1. Follow-up to the Minutes of the Technical Session 1 April 2024 2. Follow-up to the Minutes of Technical Discussion March 8, 2024 3. Follow-up to Inspection Report February 15 2024 4. Follow-up to Inspection Report January 4 2024 5. Follow-up to Inspection Report 10 August 2023 6. Follow-up to the Minutes of Technical Discussion 17 July 2023 7. Follow-up to the Minutes of Technical Discussion 21 June 2023 8. Follow-up to Inspection Report March 31, 2023 9. Follow-up to Inspection Report 24 October 2022 10. Follow-up to Inspection Report 29 June 2022	available	Not everything has been conveyed yet. The results of the follow-up should be submitted to BTB.

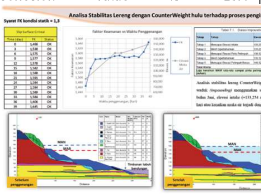
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	11. Follow-up to the Minutes of Technical Discussion 18 November 2020 m. Follow-up to Inspection Report 8 September 2020		
	C. Geology and Engineering Geology		
1.	When interpreting rock coloring on a geological map, coloring other than the identified geological rock condition, such as public facility buildings and dam bodies, should be presented in black (black shading).	It has been followed up on public facility buildings and the dam body, presented in black (black shading). 	Suggestions have been followed up. The latest geological map should be presented in the latest geological and geotechnical report.
2.	The presentation of cross-sectional and longitudinal sections of engineering geology interpreted as one with shop drawings should be improved by separating separate cross-sectional images of engineering geology.	It's been followed up 	In addition to the longitudinal engineering geological cross-section of the dam body, a cross-section of the engineering geology of the dam body should also be presented, as well as cross-sections and longitudinal

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
			engineering geology of each accessory building.
3.	When submitting documentation on the geological condition of the foundation in the dam body, it should be shown by adding an explanation of the conditions in the field according to the pictures presented.	It has been followed up by adding information to the image documentation 	It should be explained in more detail in the final construction report.
4.	Work on the upstream and downstream tunnels of the Leuwikeris Dam has been completed, but landslides still frequently occur due to landslide handling being carried out only as temporary support.		
	a. The consultant should make a chronology of all landslide incidents in tunnels in the form of a matrix table, accompanied by recommendations for long-term mitigation.	Already implemented, attached	It's been followed up
	b. In presenting the "Remarks" column for the Rock Mass Rating classification (Bieniawski, 1989), the distance range between steel ribs based on the RMR classification should be shown with the average stand-up time value included, as presented in Tables 1 & 2.	The addition of a reinforcement table based on RMR classification has been followed up 	It's been followed up

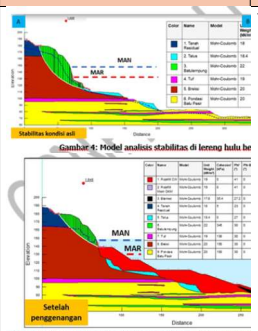
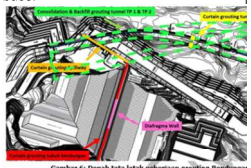
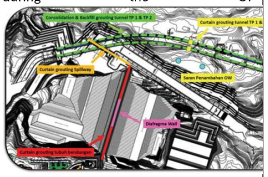
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
			
5.	On the Leuwikeris Dam landslide potential map, 19 potential landslide locations are presented around the reservoir inundation area. 		
	a. The boundary line of the reservoir inundation area should be added to the landslide potential map and differentiated from the	It has been followed up by adding the inundation area boundaries with investigation areas and aerial photos of	It's been followed up
	boundary line of the investigation area.	current conditions 	
	b. Further investigations should be carried out in the boundary areas of reservoir inundation areas that have the potential for landslides, especially in areas with boundaries based on perpendicular lines measured from the dam axle downstream (Figure 1).	Observations have been made on the perpendicular to the dam and there are 4 potential landslide points in the inundation area, all of which are below the normal water level 	The potential landslides that might occur should be detailed, including estimates of the type of landslide area (circular, translational, a combination of both), estimates of the type of landslide material (blocks, gravel, soil, etc.).
	c. The results of potential landslide location points above or below the reservoir water level should be presented clearly with the direction of the landslide included	It has been followed up for a 2 km radius of potential landslides in the inundation area	It's been followed up

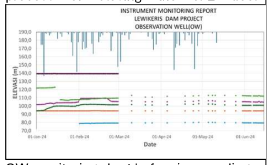
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		of the dam 	
	d. The landslide at location 14 (Figure 2) has the potential for landslides to have a major impact on the dam body if there is a change in the reservoir water level. The consultant should make a cross-sectional drawing of the engineering geology during the conditions after the initial filling of the reservoir and documentation of the actual conditions, accompanied by recommendations for mitigation.	There are 4 potential landslide conditions in the inundation area with a radius of 2 km, all of which are below the normal water level, so there is little chance of having a direct impact on the dam if a landslide occurs due to changes or fluctuations in the reservoir water level, the main concern is in the former TPA location 13 and SUTT, however The distance from the cliff (MAN) is around 75 meters so it is unlikely that there will be a direct impact on the stability of the SUTT slopes due to fluctuations in the reservoir water level, however monitoring will be recommended during the OP. Meanwhile, the TPA location has not been used for a long time and the location is above the MAB. 	It is necessary to evaluate the potential impact on dam safety if a landslide causes an earthquake and/or waves in the reservoir (reservoir induced seismicity).

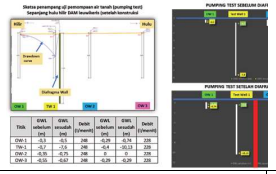
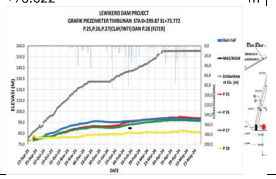
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
			
6.	On the upstream slope of the dam, it is known that landslides have occurred and the consultant has created a rotational landslide plane model as in Figure 4. If you look at the conditions in the field visually (Figure 3), it is indicated that the type of landslide is translational, considering that the landslide plane is not too deep.		
	a. The landslide field model should be re-evaluated using the slip-line approach as a translation and a combination of rotation-translation.	The landslide area based on the results of running the Geostudio model and the slip line display is already a critical slip line because above the breccia rock there is still residual soil material so it is a combination of rotation and translation. 	It's been followed up

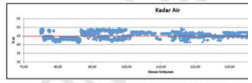
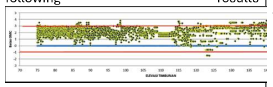
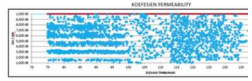
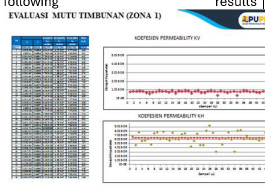
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	b. The technical property parameters used on residual soil and talus should be re-evaluated, considering that the slope conditions where landslides occur, it is necessary to carry out a back analysis assuming a cohesion value (c) = 0 kPa to obtain the value of the residual shear angle (Øresidual).	It has been followed up, assuming the cohesion value is 'zero' 	If the counterweight is built in a condition where the landslide field is not completely excavated, the counterweight stability analysis must be calculated using the residual shear strength parameter value resulting from back-analysis. The stability analysis should be re-evaluated.
	c. The consultant recommended strengthening with the counterweight method on the upstream slope of the dam (Figure 5). 1) Regular monitoring should be carried out during the initial reservoir filling phase to observe the behavior of the embankment during the impounding phase.	Before and after the impounding phase, monitoring will be carried out both visually and by reading instrumentation data. Currently, 3 sliding stakes have been installed at the top of the counterweight elevation, on top of the counterweight slope and using trashboom anchor block blocks as sliding stakes for monitoring. if movement occurs during or after the	OK. During the initial filling of the reservoir, regular monitoring and evaluation of the results of monitoring the counterweight of the upstream slope of the

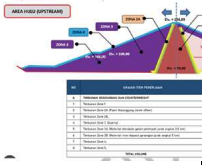
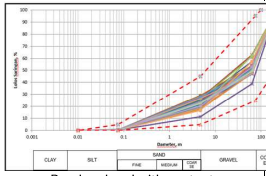
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		impounding process is carried out   	dam should be carried out. Apart from that, it is necessary to prepare an emergency action plan that needs to be carried out if poor monitoring results are obtained.
	1) After the impounding phase, the counterweight should be raised to the reservoir water level limit which is accompanied by technical justification.  Gambar 3: Kondisi longsor di	 The current condition of the counterweight. Further follow-up actions	Ok.

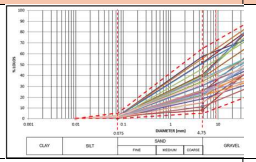
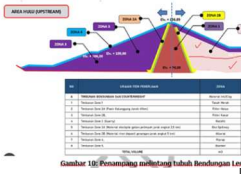
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	 Gambar 4: Model analisis stabilitas di lereng hulu be Gambar 5: Model analisis stabilitas dengan perkuatan counterweight di	will be recommended during the implementation of the OP	
	D. Foundation Repair		
1.	On the slope walls of the spillway building tunnels that intersect with consolidation and backfill grouting, there is the potential for landslides to occur due to changes in water level. Two (2) units of Observation Well (OW) should be installed on the brake of the left slope wall of the spillway building up to the depth elevation of the tunnel base.  Gambar 6: Denah tata letak pekerjaan grouting Bendungan	The point plan has been determined and will be followed up with suggestions for installing additional Observation Well during the OP 	It should be implemented in the field.
2.	In monitoring the behavior of identified springs in the dam body area, the consultant should carry out	Monitoring of the Observation Well which was installed before impounding has been carried out, monitoring after impounding	Suggestions followed up.

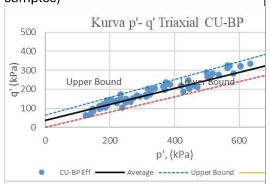
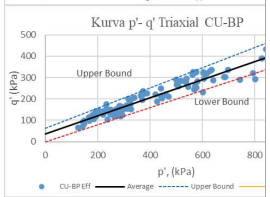
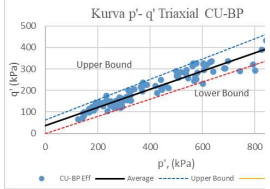
No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	Observation Well monitoring before and after impounding, and present the measurement results in graphical form to see whether there is potential uplift resistance which supports the safety of the dam.	will be intensively carried out after the process of closing the TP2 door  OW monitoring chart before impounding	
3.	The mercu apron of the spillway and intake building shows that the slopes are quite steep, so they have the potential to experience erosion due to changes in the water level of the reservoir.  Gambar 7: Foto udara apron mercu bangunan pelimpah di Bendu		
	a. Geological and geotechnical investigations should be carried out at the location of the Mercu spillway apron and intake to identify the condition of the rock and/or soil type, whether they tend to be easily eroded due to changes in M.A.W.	Geologically, the rock at the location of the spillway apron and intake building is breccia rock which is relatively compact, the distance between the apron and the slope is around 80 meters so the potential for landslides is very small. 	It's been followed up

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		Breccia rock in the lighthouse foundation and spillway apron	
	b. b. Slope repairs should be carried out to overcome the potential for scour to occur on the slope next to the Mercu spillway apron before impounding is carried out.	Geologically, the rock at the spillway apron location is breccia rock which is relatively compact, the distance between the apron and the slope is around 80 meters so the potential for landslides is very small.	OK. Consider suggestions.
	c. c. The slope next to the intake building, which has the potential for scouring, should be protected with shotcrete until the water depth reaches an elevation below the reservoir water level.	The breccia is relatively compact, and the slope below the intake is at an elevation below the low water level so it is not affected by fluctuations in the reservoir water level	OK. Consider suggestions.
4.	On the installed diaphragm wall, it is necessary to test its effectiveness using the pumping test method which is presented in the form of a bar graph. Test data should be presented clearly with a line graph showing before and after the D-Wall is installed.	This has been followed up by presenting the results of the pumping test with a line graph 	Suggestions followed up.
5.	Handling springs in the foundation of the dam's core zone has the potential to cause internal cracking which compromises the safety of the dam. The consultant should present a cross-sectional image of the dam body to see the behavior of the spring accompanied by the results of monitoring analysis and measurements of nearby instrumentation.	It has been followed up, future determinations will be observed through readings of the piezometer instrumentation at STA 299, especially at the initial embankment elevation of +73.622 m 	Ok.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		STA 299 elv instrumentation monitoring graph +76.622 m before impounding	
6.	The results of the evaluation of the effectiveness of grouting in the circumvention tunnel 2 (TP2) cannot yet be carried out because it is still functioning as a river circumventor. A visual inspection and evaluation of the effectiveness of grouting at TP2 should be carried out after the initial reservoir filling phase is completed.	Suggestions will be followed up after the process of closing the TP 2 tunnel gate is carried out	Ok.
B. Embankment Construction Quality Control			
1.	To evaluate the field water content of the core zone, in the graphical presentation of test results the OMC line should be depicted and the boundary line for the field water content range in accordance with the technical specifications, namely -1%<OMC<+3%. Next, the test results that have been obtained should be plotted, then evaluated whether the test results meet the technical specification limits.  Gambar 8: Grafik pengujian kadar air	The results of testing in the field show the following results 	Saran ditindaklanjuti.
2.	When presenting graphically the results of core zone permeability testing, each kv, kh, and k (total) test result should be depicted in a different color. Next, based on these permeability values, the quality of compaction should be evaluated, which is generally considered good if kv is around 3 to 5 times kh.  Gambar 9: Grafik koefisien permeabilitas	The results of testing in the field show the following results 	The results of the compaction quality evaluation should be explained based on the permeability test results.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
3.	It is reported that the downstream random zone at elevations below +74 m has a predominantly coarse gradation (random rock which is freedrain), while at elevations above +74 m it has a dominantly fine gradation (random soil which is semi-impermeable).		
	a. a. Because the two random types have different shear strength and permeability parameters, the dam zoning section should be depicted as different zones.	The image of random zone 3a has been separated, but is presented in the same color. In accordance with the suggestion in point H.1, in the stability analysis, random zone 3a is made into one zone, and analyzed with conservative parameters (random soil parameters).	Suggestions followed up
	b. b. For random rock zones, the soil content should be ascertained from quality control results to maintain the assumption of the material's free drain properties. 	The following is the random zone gradation curve a. Random Stones with content Fine grains (passing #200 sieve) = 0 - 3 % Sand = 10 - 30 % Gravel = 20 - 30 % > Gravel = 40 - 60 %  a. Random Land with content Fine grains (passing #200 sieve) = 0 - 5 % Sand = 7 - 54 % Gravel = 21 - 50 % > Gravel = 9 - 70 %	Suggestions followed up

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
			
	c. Because the different properties of the two types of random zones will cause different behavior/responses to reservoir filling, in the stability analysis the two zones and their parameters should be differentiated. 	The image of random zone 3a has been separated, but is presented in the same color. In accordance with the suggestion in point H.1, in the stability analysis, random zone 3a is made into one zone, and analyzed with conservative parameters (random soil parameters).	Suggestions followed up.
4.	It is reported that UU, CUBP, and CDBP triaxial tests have been carried out on core zone embankments, but there are still several samples that have not been completed (still in the testing process).		
	a. The shear strength parameters used in the stability analysis should be re-evaluated based on the results of new sample tests.	The shear strength parameters have been added with new test results a. Before additional test results (n = 20 samples)	Ok.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		b. After additional samples (n = 32 samples)  	
	a. b. You should pay attention to the designation of each triaxial test result, namely: b. 1. UU triaxial test results are used to analyze post-construction dam stability, where the consolidation process has not been completed and pore water pressure has not been dissipated. c. 2. The results of the CU triaxial test are used for short-term dam stability analysis (for example during the initial filling of the reservoir), where the consolidation process has been completed but the pore water pressure has not been completely dissipated.	Analysis of reservoir filling has used the lower bound effective shear strength parameter from the CU-BP triaxial test  φ' 23,57 ° c' 0,00 kPa	OK. It's been followed up.

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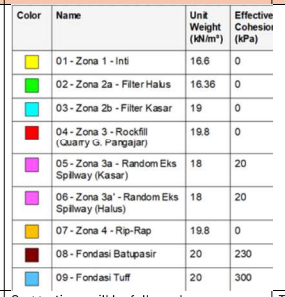
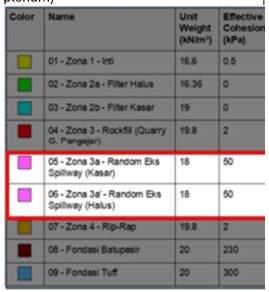
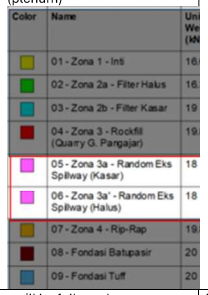
	d. 3. The CD triaxial test results are used for long-term dam stability analysis (after the dam is operational), where the consolidation process has been completed and the pore water pressure has been completely dissipated.		
	e. To evaluate the results of multilayer settlement and inclinometer settlement monitoring, deformation analysis should be carried out using the triaxial elastic modulus results and confirmed from the results of back analysis based on the results of multilayer settlement monitoring/readings.	Suggestions will be followed up	The results of the deformation analysis should be submitted to the BTB.
5.	Shear strength tests have been carried out using a large scale direct shear tool on 4 random zone soil samples in different laboratories.		
	a. In the test sample at the Indra Karya Laboratory, a value of c = 135.8 kPa was obtained which was too high. Check whether the density and regradation results of the sample are in accordance with conditions in the field. The test should be carried out undrained on samples that have been consolidated until T50 and T90	The stability analysis uses a more conservative parameter, namely c = 50 kPa, but it is still considered too large. The analysis has been followed up according to the recommendation in point E5.b.	The results of analyzes using more conservative parameters as suggested by E5.b should be presented.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	are obtained, to determine the shear strain rate.		
	b. b. It is reported that for dam stability analysis c = 50 and phi = 230 are used. To be close to conditions in the field, it is recommended to use c = 20 kPA and phi = 250.	The analysis parameters have been reduced to approximate conditions in the field. a. Parameters before reduction (pre plenum)  Color / Name / Unit Weight (kN/m³) / Effective Cohesion (kPa) 01 - Zona 1 - Inti — 16.6 — 0.5 02 - Zona 2a - Filter Halus — 16.36 — 0 03 - Zona 2b - Filter Kasar — 19 — 0 04 - Zona 3 - Rockfil (Quarry G. Pangajar) — 19.8 — 2 05 - Zona 3a - Random Eks Spillway (Kasar) — 18 — 50 06 - Zona 3a' - Random Eks Spillway (Halus) — 18 — 50 07 - Zona 4 - Rip-Rap — 19.8 — 2 08 - Fondasi Batupasir — 20 — 230 09 - Fondasi Tuff — 20 — 300 a. Parameters after reduction (plenum)  Color / Name 01 - Zona 1 - Inti 02 - Zona 2a - Filter Halus 03 - Zona 2b - Filter Kasar 04 - Zona 3 - Rockfil (Quarry G. Pangajar) 05 - Zona 3a - Random Eks Spillway (Kasar) 06 - Zona 3a' - Random Eks Spillway (Halus) 07 - Zona 4 - Rip-Rap 08 - Fondasi Batupasir 09 - Fondasi Tuff	The results of analyzes using more conservative parameters as suggested by E5.b should be presented.
	c. c. For random material whose volume is large enough, in order	Suggestions will be followed up	Not followed up yet

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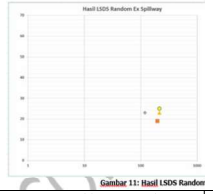
	to represent the conditions of the embankment in the field, testing should be carried out on 1 sample from every 50,000 - 75,000 m3 of embankment volume. However, at the Leuwikeris Dam, testing was only carried out on 4 samples (very minimal) because the excavation of the spillway foundation had already been completed so no more could be taken. Disturbed soil samples should be taken, then remoulded in the laboratory with water content and density according to those compacted in the field, for large scale direct shear testing, to clarify previous test results that are still doubtful.  Gambar 11: Hasil LSDS Random		
6.	For the dam stability analysis, the rockfill zone shear strength parameter used was the test results from 1 sample. To be closer to actual conditions, additional testing should be carried out in the same way as point (5) above.	Suggestions will be followed up	Not followed up yet
7.	To evaluate the durability of the riprap material which represents the installed condition, soundness and abrasion tests should be carried out, then the results evaluated against technical	Suggestions will be followed up	Not followed up yet

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	specifications, so that the rip-rap is able to overcome waves and rapid drawdown in the long term.		
F. Concrete Quality Control			
1.	Reported concrete quality standards refer to the old regulation PBI 1971 N.1.-2. You should also refer to the latest regulations, namely SNI 2847:2013 and SNI 2847:2019 concerning structural concrete requirements for buildings.	Based on planning data, the Leuwikeris Dam was started in 2012 so the concrete quality standards still use 1971 N.1.-2. And the technical specifications in the Service Provider's initial Contract Book still refer to PBI 1971. Continuing construction work on concrete quality standards begins to refer to SNI 2847;2013 and SNI 2847:2019, such as taking samples for testing according to actual structural conditions in the field (dry samples).	Suggestions have been followed up.
2.	Based on SNI 2847:2013 and SNI 2847:2019, concrete samples should be tested with two types of treatment, namely by immersion (wet samples) and according to the actual structural conditions in the field (dry samples). However, it was reported that only the concrete of the intake tower and the concrete pad at the left abutment were tested with two types of treatment.	Sampling is taken by referring to SNI 2847:2013, namely taking samples that are treated in the field like spec points. 5.6.4. (5.6.4.1-5.6.4.4.)_p. 40-41 and SNI 2847:2019.; article 26.5.3.2 Acceptance conditions: (26.5.3.2.d-26.5.3.2.e)_p.632s/d634. Procedures for the care and protection of concrete are considered adequate.	
	a. In the graph of concrete quality test results for wet samples of existing concrete structures, it appears that there are several sample test results that are lower than the technical specifications. The OP Guidelines should include locations on concrete structures that produce test values that are less than specifications, and it is recommended to carry out intensive visual inspections during the initial filling of the reservoir and during major inspections at these locations.	There are several samples that are lower than engineering specifications, present in several locations and concrete structures. The following locations and qualities are lower than the Quality of Supporting Data Plans for OP Guidelines: Locations/Structures that are of low quality & outside the requirements: 1. Low Quality in TP-01 < K300 2. Low Quality in TP-02 < K300 3. Quality beyond the requirements in Dwall > K90 4. Low Quality on SpllWay < K225 5. Low Quality at Tower Intake (Foundation) < K225 6. Low Quality in Intake Attached Table.	Suggestions have been followed up.

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		The results of low concrete quality are in accordance with existing references or technical requirements. Corrective action has been carried out in accordance with existing technical requirements, namely a non-destructive test (NDT) has been carried out using tools that have been determined by the Employer (Directors) where in Leuwikeris a calibrated hammer test is used and The results obtained are above the planned quality (meet the acceptance requirements) If the NDT test still produces LOW QUALITY results, then in accordance with the existing technical requirements, the next test will be carried out, namely: - Destructive Test (DT) by taking samples from low quality structural locations using (Core Drill B) to test the compressive strength, which is usually a cylindrical concrete test object with a certain diameter and should be the height of the cylindrical test object = 2x the diameter (L/ D=2) for example the diameter of the tool is 3" (=7.62cm) then the height is 15.24cm - The next stage of corrective action is if the results of the DT (Destructive Test) test are still of low quality (have not met the minimum planned quality limit) then a corrective action method is carried out, for example injection. - If it is felt that corrective action cannot be taken for an unsafe structure in the future, it will be considered a failure or demolished (dismantled).	
	b. In the discussion, the dry sample test results of the concrete structure of the intake tower and the concrete cap on the left support were not presented. Graphics of test	Graph of test results for dry samples from concrete structures: 1. Intake tower Foundation K225 (1a) and Wall K300 (1b) and 2. Concrete cap Left Pedestal (2a) & Right Pedestal (2b) K300	Suggestions have been followed up.

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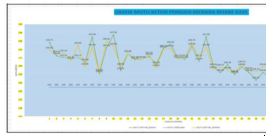
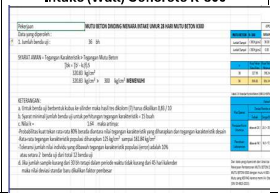
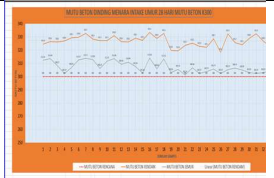
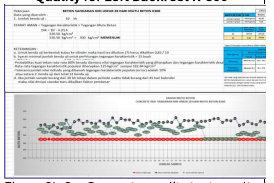
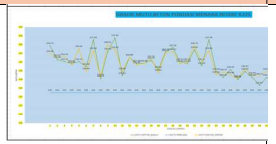
	results and evaluation should be prepared to be presented at the Plenary Session. It should be noted that procedures for the protection and maintenance of concrete should be enhanced if the strength of cylinders cured in the field at the test life specified for determination of fc' is less than 85% of the comparative strength of cylinders cured in the laboratory. The 85% limitation does not apply if the field cured strength exceeds fc' by more than 3.5 MPa.  Gambar 12: Hasil uji mutu be	Tables and Graphs are Attached Graph of Wet and Dry Concrete Strength Test Results Attached **2b. (1b). Evaluation of the Quality of Intake Concrete (Foundation) K-225**   Concrete quality test results for the K225 Intake Tower FoundationQuality of Plan, 2. Quality of Soaked/Wet Concrete, 3. Quality of Sun/Dry Concrete **2b(1b). Evaluation of the Quality of Intake (Wall) Concrete K-300** 	

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		 Figure 2b.1b: Concrete quality test results for K300 Intake Tower Wall Design Quality, 2. Soaked/Wet Concrete Quality, 3. Sun/Dry Concrete Quality **2b. (2a). Evaluation of Concrete Pad Quality for Left Backrest K-300**  Figure 2b.2a: Concrete quality test results for Concrete Pad Left Backrest K300 Design Quality, 2. Soaked/Wet Concrete Quality, 3. Sun/Dry Concrete Quality **2b. (2b). Evaluation of Concrete Pad Concrete Pad Right Backrest** K-300 	

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		 Figure 2b_2b Concrete quality test results for the K300 Right Backrest Quality of Plan, 2. Quality of Soaked/Wet Concrete, 3. Quality of Sun/Dry Concrete For concrete quality testing, wet/soaked samples and dry/sun-dried samples need to be made and tested as monitoring and the results of the soaked compressive strength quality are not always greater than the results of the dry/sun-dried quality because proper/optimum curing will produce maximum compressive strength. and can produce greater compressive strength than continuous immersion. Low Concrete Quality Results must be monitored for construction before any further corrective or repair action is taken as a guide for future OP for corrective action. Suggestions and Evaluation 2b.: • Evaluation: Concrete Compression Test Results are carried out by taking test samples from the Agitator Mixer according to existing technical requirements or the decision of the assignor (direction of the Directors) where appropriate The latest standard for concrete pressure testing refers to SNI 2847:2013 and SNI 2847:2019 according to the response at the Pre-Plenary Session on 06 June 2024 where test objects were taken using treatment of test objects according to construction treatment (Dry Test/Drying in the Sun) and treated by soaking (Wet Test).	

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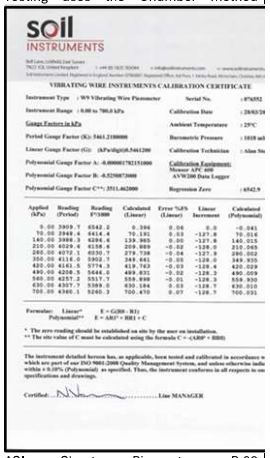
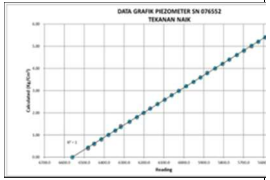
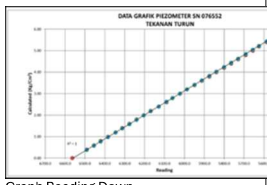
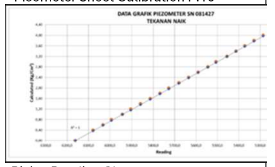
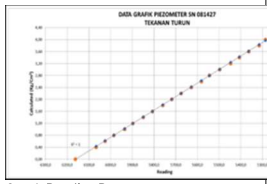
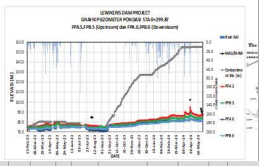
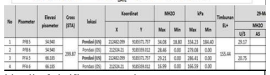
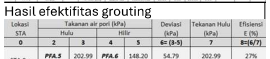
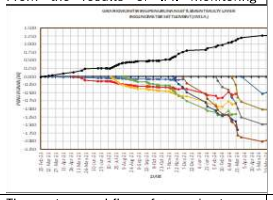
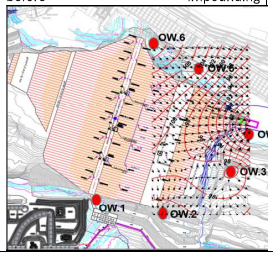
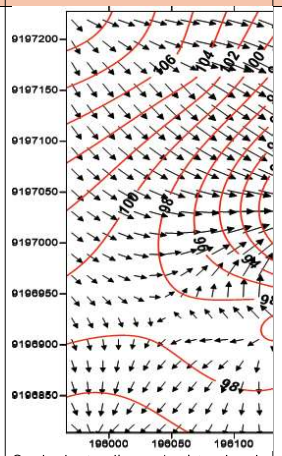
		The results of the second pressure test (Wet Test and Dry Test) are like the results of the strutkur test	
Instrumentation Analysis			
1.	It was reported that the Vibrating Wire Piezometer (VWP) pile of P37 was suspected to have broken, and the current condition could not be repaired.		
	a. It should be evaluated whether the remaining and still functioning VWP can be sufficient to evaluate the safety of the dam.	The results of the evaluation of the installed instruments are sufficient for evaluation and for monitoring P.37, there is a standpipe piezometer (OSP) to evaluate the safety of the dam during impounding and operation.	Suggestions should be heeded and acted upon.
	b. According to the contract, the equipment handed over must be in working condition. The vendor's responsibility for damaged equipment should be processed so that all instrumentation equipment that functions well before the reservoir is flooded can be provided, which will become a baseline for further monitoring.	Equipment that does not function before handover will be processed according to the agreed contract.	Suggestions should be heeded and acted upon.
2.	VWP stacks P09 and P10 reportedly produce unresponsive readings.		
	a. Unreasonable VWP readings are recommended not to be used in dam stability analysis.	Vibrating wire Pisometer readings P.09 and P.10 have not responded to the pile. The reading value is there, from the monitoring results and tested with a reading tester. Assuming there is a pressure bubble in the piezometer that has not come out, it is temporarily not used for analysis, monitoring is carried out continuously intensively, it is likely that after impounding the piezometer will respond quickly.	Suggestions should be heeded and acted upon.
	b. The consultant should prepare recommendations so that the tool can respond again. For	The tool has been calibrated and checked in the field with the results below.	Even though calibration has been

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	further work, it is necessary to ensure that the installed equipment can respond well, for example by calibrating before installation and checking the initial reading of the equipment during installation.	Testing uses the Chumber method  soil INSTRUMENTS VIBRATING WIRE INSTRUMENTS CALIBRATION CERTIFICATE ASI Sheet Pisometer P.09  DATA GRAFIK PIEZOMETER SN 076552 TEKANAN NAIK Rising Reading Chart	carried out, the reading results appear unresponsive. The consultant should make recommendations for handling equipment that cannot respond.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		 DATA GRAFIK PIEZOMETER SN 076552 TEKANAN TURUN Graph Reading Down Pisometer Sheet Calibration P.10  DATA GRAFIK PIEZOMETER SN 081427 TEKANAN NAIK Rising Reading Chart  DATA GRAFIK PIEZOMETER SN 081427 TEKANAN TURUN Graph Reading Down	
3.	VWP of STA foundation 0+229.87, piezometer readings upstream and downstream of the grouting curtain/diaphragm wall almost coincide after an increase (due to standing water upstream?) which indicates less effective grouting results (??)		

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	a. An analysis of the dam's stability should be carried out regarding potential uplift pressures that occur due to ineffective grouting. The analysis is carried out by predicting the amount of lifting pressure from the increase in reservoir water level during impounding. The results of this sensitivity analysis are used as a guide in the impounding process later.	Results of piezometer foundation monitoring Sta 0+299.87   Hasil efektifitas grouting 	Suggestions should be heeded and acted upon. An analysis of the dam's stability regarding the potential uplift pressure that occurs due to ineffective grouting should be submitted to the BTB.
	a.During the initial filling of the reservoir, it is necessary to carry out an intensive evaluation of dam safety based on the results of piezometer monitoring, the foundation (item a) to determine whether the initial filling of the reservoir is safe to continue or needs to be stopped temporarily, the pore water pressure produces stability analysis results that meet the requirements.	Monitoring continues to be carried out intensively during the construction process and during impounding. To evaluate dam safety.	Ok.
4.	The Open Standpipe Piezometer (OSP) in the downstream shoulder zone shows readings indicating the presence of transient pore pressure. The slope stability analysis should accommodate transient pore pressure values, as measured in the OSP.	Suggestions were followed up, to evaluate the safety of the dam. slope stability analysis accommodates transient pore pressure	The results of the slope stability analysis that accommodates transient pore pressure values should be submitted to the BTB.
5.	There was a sudden decline in the multilayer settlement monitoring results of STA 0+133.22 IM1. The cause of the sudden decline that occurred should be examined and the potential for cracks to occur.	From the results of IMI monitoring' 	Suggestions have not been followed up. The cause of the sudden drop in multilayer settlement readings has not been explained.
6.	Based on the monitoring results of OW-2, OW-3, OW-4, OW-5, and OW-6, groundwater level contours have been created in the dam area. Based on the contour of the resulting groundwater level, it should be evaluated and described the direction of ground flow in conditions before initial filling of the reservoir, as initial data to be evaluated after initial filling of the reservoir later.	The contour and flow of groundwater are depicted as follows: before impounding 	The suggestion has been followed up.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		 Gambar kontur aliran muka air tanah pada tanggal 14 Juni 2024	
G. Evaluation of Dam Stability Analysis			
1.	The downstream random zone below an elevation of +74 m is random rock which is freedraining, while the downstream random zone above +74 m elevation is random soil which is semi-impermeable. In accordance with suggestion E.3.b, because the different properties of the two types of random zones will cause different behavior/responses to reservoir filling, in the stability analysis the two zones and their parameters should be differentiated or the most conservative concept used, namely that all downstream random zones are considered as random soil material (semi-impermeable) with the lowest shear strength parameter taken.	In accordance with the suggestion in point E5.b, an analysis has been carried out assuming the downstream random zone to be a random soil zone with conservative parameters. Color | Name | Unit Weight (kN/m³) | Effective Cohesion (kPa) 01 - Zona 1 - Inti | 16.6 | 0 02 - Zona 2a - Filter Halus | 16.36 | 0 03 - Zona 2b - Filter Kasar | 19 | 0 04 - Zona 3 - Rockfill (Quarry G. Pangajar) | 19.8 | 0 05 - Zona 3a - Random Eks Spillway (Kasar) | 18 | 20 06 - Zona 3a' - Random Eks Spillway (Halus) | 18 | 20 07 - Zona 4 - Rip-Rap | 19.8 | 0 08 - Fondasi Batupasir | 20 | 230 09 - Fondasi Tuff | 20 | 300	Suggestions followed up.
2.	In the dam stability analysis after completion of construction, the Consultant carried out a safety factor scenario based on Ru values in the range of 0.1 to 0.6 as shown in the figure below.		
	a. When construction is complete, the consultant should carry out a slope stability analysis based on the pore water pressure values in the core zone and in the random soil zone. From the results of analysis by consultants on the Ru value of the core zone of 0.6 and the Ru of the random soil zone of 0.3 with an OBE earthquake, the FK value = 1.158 is close to the min requirement of 1.1.	Stability analysis with various Ru values in the core zone and random zone is intended to determine the safe limit (benchmark) for piezometer pore water pressure readings in the core material and random material. RU material inti = 0,6 y/h | Overburden (kPa) | $RU_{1,2}$ 0,25 | 412,55 | 0,380 0,50 | | 0,030 0,75 | | 0,246 1,00 | | 0,507	The consultant should carry out a stability analysis with pore water pressure values according to those in the core zone and random soil zone.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN

RU material inti = 0,6

y/h	Overburden (kPa)	$RU_{1,0}$
0,25	412,55	0,761
0,50		0,277
0,75		0,501
1,00		0,865

RU material inti = 0,5

y/h	Overburden (kPa)	$RU_{1,2}$
0,25	412,55	0,381
0,50		0,039
0,75		0,381
1,00		0,509

RU material inti = 0,5

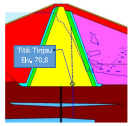
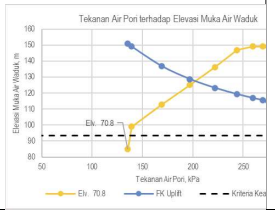
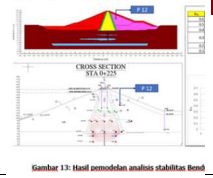
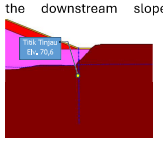
y/h	Overburden (kPa)	$RU_{1,0}$
0,25	412,55	0,761
0,50		0,285
0,75		0,503
1,00		0,867

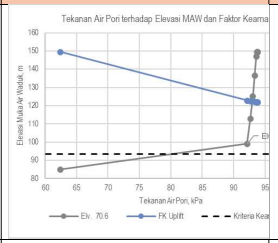
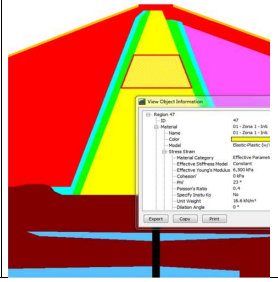
RU material inti = 0,6, 0,3, 0,1

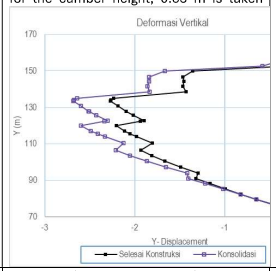
y/h	Overburden (kPa)	$RU_{1,2}$
0,25	412,55	0,582
0,50		0,192
0,75		0,318
1,00		0,331

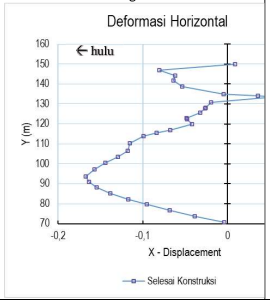
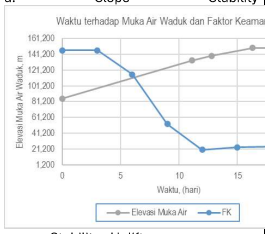
RU material inti = 0,6, 0,3, 0,1

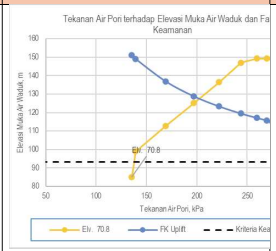
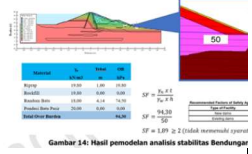
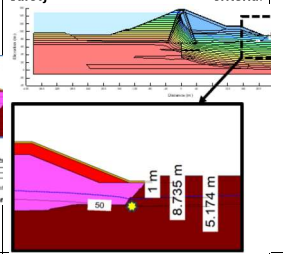
y/h	Overburden (kPa)	$RU_{1,0}$
0,25	412,55	0,907
0,50		0,431
0,75		0,615
1,00		0,739

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	b. When the reservoir is filled, the piezometer that needs to be paid attention to and monitored regularly is the piezometer on the dam foundation because it has the potential to produce overlapping pore water pressure data. An uplift resistance value scenario should be carried out by graphing the relationship between pore water pressure and M.A.W. elevation. based on piezometer reading data at the dam foundation.	Suggestions are followed up, following the results of stability analysis of uplift in the foundation.  	It's been followed up
	c. Based on the calculated uplift pressure value, a dam stability analysis should be carried out against overburden pressure with a minimum of FK ≥ 2, referring to SNI 8460: 2017. A stability analysis simulation of uplift downstream should be carried out.  Gambar 13: Hasil pemodelan analisis stabilitas Bend	Follow-up suggestions, following the results of the stability analysis of uplift on the downstream slope (dam foot) 	The dam safety evaluation of uplift potential should be explained based on the results of the calculations carried out.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
			
3.	Deformation analysis carried out at the Leuwikeris Dam should use the elastic modulus (E) value as follows.		
	a. For the core zone, it is taken from the triaxial results of CUBP (completed construction) and CDBP (long term, after consolidation is complete), compared with the results of the back analysis from multilayer settlement. Meanwhile, random material and rockfill can be taken empirically, because rock triaxil is not carried out.	The modulus of elasticity of the core material based on CUBP triaxial results = 8,000 kPa The elastic modulus of the core material based on back analysis of multilayer settlement = 6,500 kPa Random (empirical) material modulus of elasticity = 20,000 kPa Modulus of elasticity of rockfill material (empirical) = 100,000 kPa 	Suggestions followed up.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	b. In the analysis of deformation in the Y direction (subsidence), a comparison of the parabolic curves obtained at the completion of construction and at the completion of consolidation should be made. The largest difference between the two curves is used to determine the camber height. The value obtained is then compared with 1% of the dam height (rule of thumb) to take the largest value which is used as the chamber height.	Suggestions followed up. Vertical deformation analysis will be compared to 1% of the dam height. The value taken is the value of the largest decrease. Vertical deformation after construction = 2.26 m Vertical deformation after consolidation = 2.68 m Difference in vertical deformation = 0.41 m 1% of the dam height (85 m) is 0.85 m. So for the camber height, 0.85 m is taken 	Suggestions followed up.
	c. Using the same modulus, deformation analysis is carried out in the X direction (horizontal). The results of this analysis are used to determine the amount of horizontal movement permitted from the inclinometer results in conditions of completion of construction, normal reservoir water level and rapid draw down.	The horizontal deformation after construction from the analysis results is 16 cm in the upstream direction. The deformation results will then be compared with the inclinometer	Suggestions followed up.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		instrument readings in the field 	
4.	The stability of the dam needs to be continuously assessed during the flooding process of the Leuwikeris Dam with a height of more than 80 meters, which should be carried out based on visual monitoring and instrumentation readings to determine whether the reservoir water level will continue to rise or if it needs to be reviewed.	Based on the results of the analysis of slope stability and uplift during reservoir filling (impounding), the following results are shown. a. Slope Stability  a. Stabilitas Uplift	During the initial filling of the reservoir, each time the reservoir water level increases, a review of the dam stability analysis should be carried out based on changes in instrumentation readings. The results of the stability analysis review at each increase in the reservoir water level will later be

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		 Instrument monitoring will be carried out during reservoir filling	used to evaluate the safety of the initial filling of the reservoir as a consideration in deciding whether filling the reservoir can be continued or needs to be paused and reviewed.
5.	In the analysis of dam stability against uplift, FK = 1.89 was obtained, which does not meet the requirement of FK ≥ 2. Treatment should be recommended for this condition. The uplift pressure should also be included as input data in the steady seepage condition stability analysis.  Gambar 14: Hasil pemodelan analisis stabilitas Bendungan	Analysis has been carried out with the latest parameters (by adding the results of recently completed tests). The results of the stability analysis of uplift **meet the safety criteria**. 	Ok.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
		Material / **Gamma kN/m3** / **Tebal m** Riprap 19.80 1.00 Rockfill 19.80 0.00 Random 18.00 8.74 Pondasi Batupasir 20.00 5.17 **Total Over Burden** **Overburden** **280.5** kPa Tekanan Piezometrik 50.0 kPa SF **5.61** ≥ mem	
H. Hydrological Analysis			
1.	In analyzing the Leuwikeris Dam as a flood controller, the Consultant analyzed six alternatives for reservoir operation patterns and the scenario chosen was scenario 4A. In scenario 4A, the water level will be lowered by 5 m below the normal water level for six months in the rainy season, so that the Control Water Level (CWL) elevation is +144.3 meters above sea level. When compared with scenario 2A (early release with a decrease of 5 m), there are similarities in terms of flood reduction benefits, but for providing irrigation water needs, the irrigation IP in scenario 4A is greater than the irrigation IP resulting from scenario 2A.		
	a. Considering that the Leuwikeris Dam does not have a bottom outlet and so that the intake gate can be utilized optimally, consider adding a reservoir operating pattern scenario with an early release that is lowered to 10 m below the MAN. To determine the reservoir operation pattern that will be selected, discussions will be	Suggestions received, reservoir simulation analysis and reservoir operation patterns with early release and Control Water Level with water level reduction of up to 10 m have been carried out and created in the matrix.	Suggestions have been followed up.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	held again at the upcoming KKB Plenary Session.		
	b. Anticipation should still be carried out with an early warning system or a combination of scenarios with early release if flooding occurs during the dry season.	Suggestions accepted, studies regarding early release are still being considered in addition to Water Level Control operations	Suggestions are of atterntion
	c. In the Citanduy watershed, it is reported that the Flood Forecasting and Warning System (FFWS) system has been used to monitor and anticipate flood events which were carried out manually in the past. It should be possible to update the FFWS in a way that is synchronized with the latest technology.	Suggestions to update the Flood Forecasting and Warning System (FFWS) system were received and submitted to the Citanduy River Region Headquarters.	Suggestions are taken into account and followed up.
	d. The flood reduction listed in table 3 is different from the information presented in previous reports so it is necessary to update the technical data.	Suggestions Accepted	The results of updates to the early release scenario matrix should be presented in the final report and submitted to the BTB.
2.	The consultant stated that the outflow discharge was 5 m^3/sec. Considering that the discharge for raw water needs is 0.8 m^3/s and there is no intake for raw water, the technical data for outflow	Suggestions Accepted	Technical data should be updated in every technical

Tabel 3: Alternatif pola pengo


PENGOPERASIAN WADUK

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
	discharge should be changed to 5.8 m^3/s.		report required and submitted to BTB.
3.	It was stated that at the Leuwikeris Dam, the sedimentation rate that occurred with a trap efficiency of 74% was equivalent to 0.77 mm/year. The consultant added that as a conservation measure, 30 Sediment Control Structures (BPS) in the Citanduy River system have been identified that appear to be unnecessary. The consultant and BBWS Citanduy should review the results of the sedimentation study which resulted in the construction plan for the 30 sediment control buildings.	30 BPS were proposed in the Leuwikeris Dam sedimentation control study and have been followed up with DED 8 BPS. With the 8 BPS, the erosion rate is reduced from 0.97 mm/year to 0.90 mm/year with dredging twice in 1 year. Analysis of sedimentation can be carried out further if bathymetry measurements are carried out in subsequent studies to evaluate the results of USLE analysis.	Suggestions have been followed up.
4.	Considering that the OP team's explanation was not completely the same as what the hydrology team meant, the hydrology team should explain in detail to the OP team regarding reservoir operations, especially during floods. Reservoir operations so that operations can be explained step by step in writing and simply, so that dam operators can understand them	Suggestions Accepted. It has been stated in the Leuwikeris Dam OP guidelines	The revised OP guidelines should be submitted to the BTB.
I. Hydromechanical			
1.	Impounding of the Leuwikeris Dam is planned to be carried out at the end of July. However, the consultant said that the main plugging and penstock on the new intake would be functional at the end of September. While the intake is not yet functioning, water will be passed through the early release gate at elevation 139. The consultant should schedule that all penstock pipes and hydromechanical equipment downstream are ready for operation before September.	Progress will be accelerated to achieve everything Hydromechanical equipment was installed at the end of September 2024	Suggestions are heeded and acted upon.

No	URAIAN/SARAN	TINDAK LANJUT OLEH PEMRAKARSA BENDUNGAN/ KONSULTAN SUPERVISI	TANGGAPAN KAJIAN BALAI TEKNIK BENDUNGAN
2.	The consultant said that the bypass door was lowered manually with a chain block. Considering that dodging doors weigh 15 tonnes per door, consideration should be given to using an electric hoist to lower the door, so that the time required is quicker and the lowering can take place more safely.	The use of a drive with an electric hoist is hampered by the time it takes to arrive from the vendor. To ensure safety, regular cleaning and re-checking of all dimensions, rubber seals and dirt has been carried out on the door block and attempts have been made to lower the door until it approaches the water level.	The consultant should recommend the use of an electric chain hoist for subsequent periodic maintenance, especially for preparation of the application for approval for the Leuwikeris Dam operating permit.
3.	It was reported that early release system cables were stolen. The procurement of the required cables should be accelerated and provided protection for exposed cables	The procurement process has been started by the vendor and is being worked on	Suggestions are heeded and acted upon. Considering that the cables are installed openly (exposed), consultants should consider installing a planting system, using trenches and trays, depending on the