



**Republic of Indonesia, Ministry of Public Works
Directorate General of Water Resources**

**Indonesia
Expert Dispatch Scheme
Dam Design and Construction
Advisory Services**

**Completion Report
Supporting Report 1
Summary of Regulations, Laws and
Guidelines on
Dam Safety and Construction in Indonesia**

February 2025



Japan International Cooperation Agency



**CTI Engineering International Co., Ltd.
CTI Engineering Co., Ltd.**

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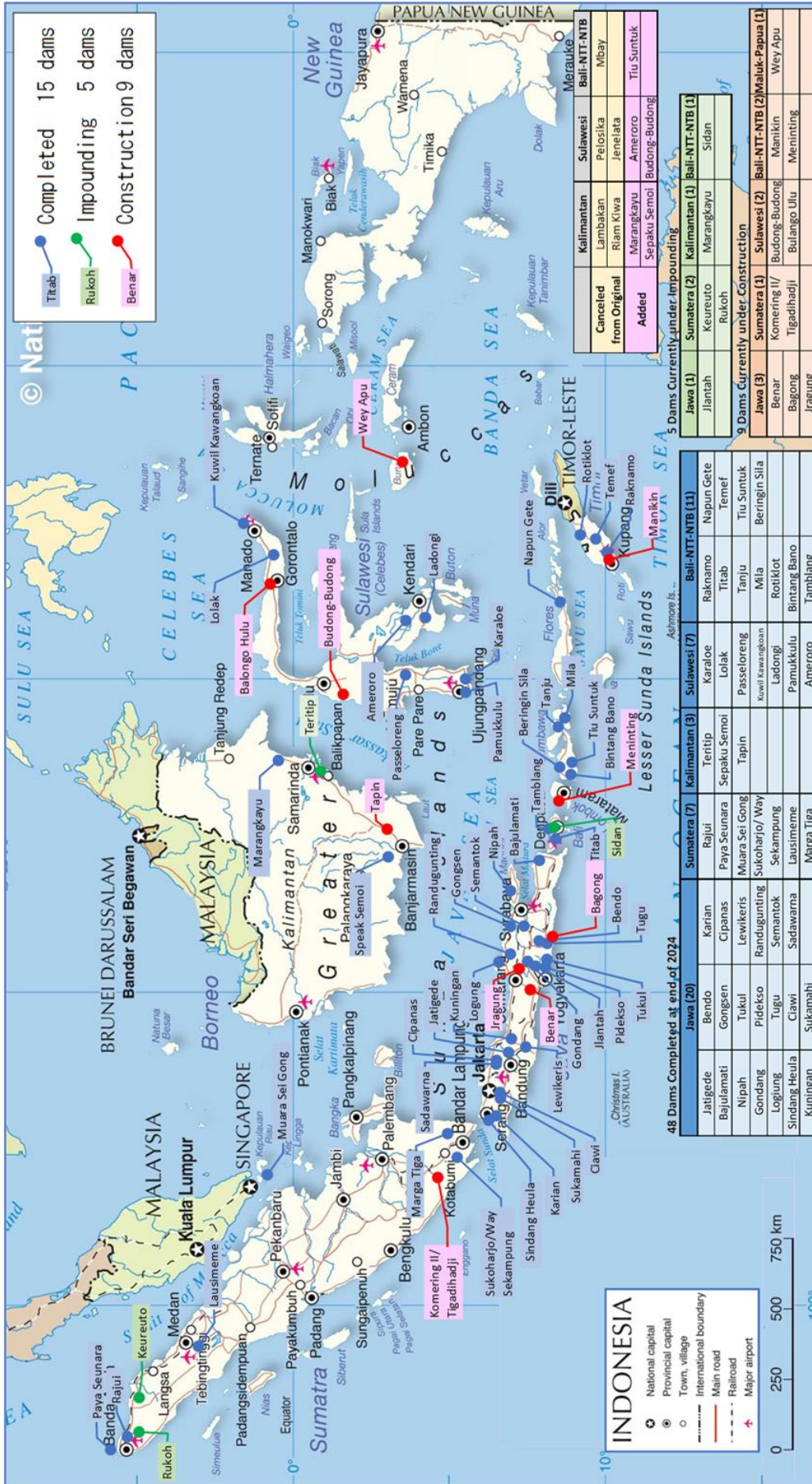
February 2025



Japan International Cooperation Agency



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Location of Objective 61 Dams
 Dams Completed from 2015 up to 2024 and Dams Currently Under Construction

List of Collected Documents

I. Technical Standard/Regulation of Dams	I. Technical Standard/Regulation of Dams (Continue)
1. Hazard Classification of Dams	22. Technical Guideline: Book 1 Very Complexed Bent of Concrete
2. Emergency Action Plan	23. Technical Guideline: Book 2 Very Complexed Bent of Concrete
3. Regulation: Procedure for Process of Dam Safety Commission	24. Guideline: Bend on Concrete Membrane of Rockfill Dam (CFRD).
4. Regulation: Procedure for Approval -Dam Construction & Demolition	25. Attachment A. Guideline for Design & Construction of Concrete Facing Rockfill Dam
5. Guideline: Impounding Reservoir	26. Attachment B. Guideline for Design & Construction of Concrete Facing Rockfill Dam
6. Guideline: Dam Safety Inspection & Evaluation	27. Technical Guidelines: Dam Risk Assessment
7. Guideline: Dam Safety Assessment	28. TECHNICAL GUIDELINES. DAM RISK ASSESSMENT LAMP
8. Guideline: Seepage Control in Filltype Dam	29. Guideline: Planning & Construction of Tunnel for Dam
9. Guideline: Dam Operation & Maintenance _ Vol. 1 - 5	30. Attachment: Guideline for Planning & Construction for Dam
10. Guideline: Sedimentation Management	II. Government/Minister Regulation
11. Guideline: Tailing Dam for Mining	1. Government Regulation of the Republic of Indonesia Number 37, 2010, Regarding Dam
12. Guideline: Implementation of Fill-type Dam Construction	2. Minister Order of The PUPR regarding Dam Number 27/PRT/M/2015
13. Manual for Visual Inspection of Fill Type Dam	3. Amendment of Minister Order of The PUPR related to Dam, No.6 2020
14. Guideline: General Design Criteria for Fill-Type Dam	III. Others
15. Guideline: Grouting of Dam	1. Standard for Fill-Type Dam Planning
16. Guideline: Construction of Cut-Off Wall of Fill-type Dam	2. Vol 1. Survey & Investigation
17. Guideline: Dam on Soft Soil Foundation	3. Vol 2. Hydrological Analysis
18. Guideline: Dynamic Analysis of Fill-Type Dam	4. Vol 3. Dam Foundation & Dam body
19. Guideline: Dynamic Analysis of Gravity Concrete Dam	5. Vol 4. Design of Dam Appurtenant Structures
20. Guideline: Survey & Monitoring of Reservoir Sedimentation	6. Vol 5. Hydromechanics, Instrumentation & Complementary Works
21. Technical Guideline: Dam Hazard Classification	7. Indonesian Earthquake & Hazard Map, 2017

Summary of Regulations, Laws and Guidelines on Dam Safety and Construction in Indonesia

General Map

List of Collected Documents

Table of Contents

1. Overview	1
2. Summary of Collected Documents	1
2.1 General Guidelines for Dam Construction in Indonesia	1
2.2 Collection of Guidelines for Dam Safety and Construction	2
2.3 Regulations and Technical Guidelines for Dam Safety and Construction	4
2.4 Panduan Perencanaan Bendungan Urugan: Planning Guidelines for Earthfill Dams.....	5
2.5 Technical Guidelines for Earth-fill Dam Planning and Design	6
2.6 Summary of Additional Technical Guidelines for Dams	7
2.7 Implementation and Compliance	11
3. Conclusion.....	11

Attachment

Attachment 1 : List of Collected Documents and the Contents

Attachment 2 : Table of Contents of the Documents (English Translation)

Summary of Regulations, Laws and Guidelines on Dam Safety and Construction in Indonesia

1. Overview

This report extensively summarizes the guidelines, regulations, and technical standards governing dam safety, construction, and management in Indonesia. Developed by the Ministry of Public Works and Public Housing and the Dam Safety Commission, these guidelines aim to ensure dams are designed, built, and managed with the highest safety standards, environmental sustainability, and social responsibility. The guidelines also reflect Indonesia's commitment to integrating advanced technologies and disaster mitigation strategies into dam safety practices.

2. Summary of Collected Documents

2.1 General Guidelines for Dam Construction in Indonesia

The “Pedoman Umum Pembangunan Bendungan di Indonesia” (General Guidelines for Dam Construction in Indonesia) offers a comprehensive framework for planning, designing, constructing, operating, and maintaining dams nationwide. These guidelines are critical in ensuring dams' safety, functionality, and sustainability, essential for water resource management, flood control, irrigation, and hydroelectric power generation.

Key Sections:

(1) Planning and Feasibility Studies:

- Site Selection: Criteria for site selection include topographical, geological, hydrological, and environmental factors.
- Feasibility Studies: Detailed assessments of technical, economic, social, and environmental viability are required.

(2) Design Guidelines:

- Structural Design: Emphasizes robust designs capable of withstanding seismic activities and extreme weather.
- Hydrological Considerations: Focuses on water flow management, spillways, and reservoir operations.
- Environmental and Social Impact: Mitigation measures for habitat loss, community displacement, and river flow alterations.

(3) Construction Procedures:

- Quality Control: Strict measures to ensure integrity and safety during construction.
- Contract Management: Clear guidelines for roles, responsibilities, and smooth project execution.

(4) Operation and Maintenance:

- Safety Monitoring: Regular inspections and monitoring systems to detect potential issues.
- Emergency Preparedness: Comprehensive plans, including early warning systems and evacuation procedures.

- (5) Regulatory and Legal Framework:
 - Compliance: Dams must adhere to national laws, regulations, and international best practices.
 - Institutional Responsibilities: The roles of various government bodies and stakeholders are clearly delineated.
- (6) Environmental and Social Management:
 - Sustainability Measures: Incorporation of sustainable practices to minimise environmental degradation.
 - Community Engagement: Stakeholder involvement to ensure equitable distribution of benefits.

Conclusion:

The General Guidelines for Dam Construction in Indonesia serve as a critical tool for ensuring dam projects are conducted with the highest standards of safety, environmental stewardship, and social responsibility, contributing to the sustainable development of water resources while minimizing risks.

2.2 Collection of Guidelines for Dam Safety and Construction

This section summarizes various technical guidelines issued by the Ministry of Public Works and Public Housing and the Dam Safety Commission, covering various aspects related to dam safety, construction, operation, and maintenance.

Key Documents:

- (1) Guidelines for Determining Dam Hazard Classification:
 - Methodology for classifying dams based on hazard levels is essential for risk assessment and emergency planning.
- (2) Guidelines for Emergency Action Plan Preparation:
 - Framework for preparing Emergency Action Plans (EAPs), including risk assessments and evacuation procedures.
- (3) Rules of Procedure for Dam Safety Commission Meetings:
 - Procedural rules for conducting meetings within the Dam Safety Commission, covering responsibilities and decision-making processes.
- (4) Guidelines for Approval and Decommissioning of Dam Functions:
 - Procedures for obtaining approval for dam construction and decommissioning, ensuring compliance with legal requirements.
- (5) Guidelines for Reservoir Filling:
 - Instructions for safely filling reservoirs, including monitoring water levels and ensuring dam stability.
- (6) Guidelines for Dam Safety Inspection and Evaluation:
 - Detailed inspection and evaluation processes are used to ensure dams' ongoing safety and integrity.

- (7) Guidelines for Dam Safety Assessments:
 - Methodology for conducting comprehensive safety assessments, including risk analysis and structural evaluations.
- (8) Guidelines for Seepage Control in Earthfill Dams:
 - Focuses on controlling seepage in earthfill dams, crucial for maintaining structural integrity.
- (9)–(13) Operation and Maintenance Guidelines (Parts 1-5):
 - Detailed guidelines for the operation and maintenance of dams, covering inspections, schedules, and operational procedures.
- (14) Guidelines for Reservoir Sedimentation Management:
 - Strategies for managing sedimentation in reservoirs, crucial for maintaining operational efficiency.
- (15) Guidelines for Mine Waste Dams:
 - Safety and environmental considerations specific to dams associated with mine waste, including design and monitoring practices.
- (16) Guidelines for the Construction of Earthfill Dams:
 - Comprehensive instructions for constructing earthfill dams, including design criteria and construction techniques.
- (17) Manual for Visual Inspection of Earthfill Dams:
 - Guidance on visual inspections of earthfill dams, including procedures and criteria for assessing dam conditions.
- (18) General Design Criteria for Dams:
 - Outlines general design criteria, including structural, hydrological, and geotechnical considerations.
- (19) Guidelines for Grouting in Dams:
 - Instructions for grouting in dam construction, focusing on techniques to enhance stability.
- (20) Guidelines for Constructing Cut-Off Walls in Earthfill Dams:
 - Details the construction of cut-off walls to control seepage in earthfill dams.
- (21) Guidelines for Dams on Soft Soil Foundations:
 - Instructions for constructing dams on soft soil foundations, addressing unique challenges.

- (22) Guidelines for Dynamic Analysis of Earthfill and Concrete Dams:
 - Procedures for conducting dynamic analyses and assessing dam behaviour under seismic and dynamic loads.
- (23) Guidelines for Dynamic Analysis of Gravity Concrete Dams:
 - Instructions for dynamic analysis of gravity concrete dams, focusing on seismic stability.
- (24) Guidelines for Survey and Monitoring of Reservoir Sedimentation:
 - Guidance on surveying and monitoring sedimentation in reservoirs is crucial for long-term dam operations.
- (25)-(29) Technical Guidelines for Dam Construction:
 - Detailed technical guidelines covering various aspects of dam construction, including hazard classification, roller-compacted concrete dams, risk assessment, and more.

Conclusion:

This comprehensive collection of guidelines provides a robust framework for ensuring the safety, durability, and environmental sustainability of dam projects in Indonesia. Adherence to these guidelines is crucial for successfully and safely implementing dam projects across the country.

2.3 Regulations and Technical Guidelines for Dam Safety and Construction

This section focuses on the key regulations and technical guidelines that form the legal and procedural framework for dam safety in Indonesia.

Key Regulations:

- (1) Permen PUPR 27-2015:

Regulation on the Safety of Dams: Establishes the framework for dam safety management, including classification, safety requirements, emergency preparedness, monitoring, and reporting. Permen PUPR 27-2015 is a critical regulation issued by the Ministry of Public Works and Public Housing (PUPR), focusing on the overall safety of dams. The regulation establishes the framework for dam safety management, including:

- (a) Classification of Dams: Dams are classified based on their size, location, and potential hazard. This classification determines the level of safety measures required.
- (b) Safety Requirements: a) The regulation specifies the minimum safety requirements for the design, construction, operation, and maintenance of dams. b) It mandates regular safety inspections and the implementation of risk management plans.
- (c) Emergency Preparedness: Guidelines for preparing and implementing Emergency Action Plans (EAPs) for dams, including procedures for communication, evacuation, and post-event analysis.
- (d) Monitoring and Reporting: a) Dams are required to have monitoring systems in place to detect and respond to potential safety issues. b) Regular reporting

to the Dam Safety Commission is required to ensure ongoing compliance.

(2) Permen PUPR 06-2020:

Regulation on Dam Safety Management: Provides detailed guidance on dam safety management, including risk assessments, safety audits, public safety, and periodic reviews. Permen PUPR 06-2020 builds upon the framework established in Permen PUPR 27-2015, providing more detailed guidance on the management of dam safety:

- (a) Management Systems: The regulation outlines the establishment of a comprehensive dam safety management system, integrating risk assessments, safety audits, and continuous improvement processes.
- (b) Roles and Responsibilities: Clarifies the roles of various stakeholders, including dam owners, operators, and regulatory bodies, in maintaining dam safety.
- (c) Technical Requirements: Provides technical guidelines for conducting safety assessments, including hydrological, geological, and structural analyses.
- (d) Public Safety: Emphasizes the importance of public safety, requiring dams to be equipped with warning systems and emergency preparedness measures.
- (e) Periodic Reviews: The law mandates periodic safety reviews and updates to safety management plans based on new data or technological advancements.

(3) Permen PUPR 07-2023:

Updated Regulation on Dam Construction and Safety: Introduces updates focused on technological integration, sustainability measures, disaster mitigation, inspection protocols, and training. This report provides a thorough overview of the key regulations and guidelines governing dam safety, construction, and maintenance in Indonesia. The documents outlined are essential for ensuring dams are designed, built, and managed according to high safety and sustainability standards.

- (a) Technological Integration: Encourages the adoption of advanced technologies, such as remote sensing and real-time monitoring, for improved dam safety management.
- (b) Sustainability Measures: Incorporates environmental sustainability into dam safety practices, ensuring that dam operations minimize ecological impacts.
- (c) Disaster Mitigation: Strengthens the focus on disaster mitigation, particularly in areas prone to natural hazards such as earthquakes and floods.
- (d) Enhanced Inspection Protocols: Introduces stricter inspection protocols, with increased frequency and detail in the assessment of dam integrity.
- (e) Training and Capacity Building: Emphasizes the importance of training for personnel involved in dam safety, including regular drills and updates on best practices.

(4) Panduan Perencanaan Bendungan Urugan: Planning Guidelines for Earthfill

Dams

The Panduan Perencanaan Bendungan Urugan is a series of volumes that provide comprehensive guidance on the planning and design of earthfill dams:

(5) Volume 1: Survey & Investigation:

This volume focuses on the initial surveys and investigations necessary to plan an earthfill dam. It covers site selection, geological and hydrological assessments, and baseline data collection, which are essential for the design phase.

(6) Volume 2: Hydrological Analysis

This volume provides methodologies for hydrological analysis, including calculating inflows, assessing flood risks, and determining reservoir capacity. It ensures that the dam is designed to handle extreme weather events and variable water flows.

(7) Volume 3: Foundation and Body Design

This volume outlines the principles for designing the dam's foundation and body. It includes guidelines on material selection, structural stability, and methods to prevent seepage and erosion.

(8) Volume 4: Design of Complementary Structures

Covers the design of ancillary structures such as spillways, drainage systems, and other components critical to the safe operation of the dam. These structures ensure the dam can safely manage excess water and prevent overtopping.

(9) Volume 5: Hydromechanical Works, Instrumentation, and Complementary Structures

Focuses on the hydromechanical aspects, instrumentation, and additional structures essential for the dam's operation. It includes guidelines for installing and maintaining equipment that monitors dam performance and safety.

(10) Pedoman Umum Bendungan: General Guidelines for Dams

Provides broad guidelines applicable to all types of dams, covering various aspects of their lifecycle from design and construction to operation and maintenance.

Conclusion: These regulatory and technical guidelines are essential for ensuring that dams in Indonesia are designed, constructed, and managed according to high safety and sustainability standards. The regulations, particularly those updated in recent years, reflect Indonesia's commitment to integrating modern technology and disaster mitigation strategies into dam safety practices.

2.4 Technical Guidelines for Earth-fill Dam Planning and Design

This section provides an in-depth summary of the guidelines specifically related to earth-fill dam planning and design, which are critical for ensuring the stability and safety of these structures.

Volumes Overview:

- (1) Volume 1: Survey & Investigation
 - This volume focuses on the initial surveys and investigations necessary to plan an earthfill dam. It covers site selection, geological and hydrological assessments, and baseline data collection, which are essential for the design phase.
- (2) Volume 2: Hydrological Analysis
 - Provides methodologies for hydrological analysis, including calculating inflows, assessing flood risks, and determining reservoir capacity. This volume ensures that the dam is designed to handle extreme weather events and variable water flows.
- (3) Volume 3: Foundation and Body Design
 - This volume outlines the principles for designing the dam's foundation and body. It includes guidelines on material selection, structural stability, and methods to prevent seepage and erosion.
- (4) Volume 4: Design of Complementary Structures
 - Covers the design of ancillary structures such as spillways, drainage systems, and other components critical to the safe operation of the dam. These structures ensure that the dam can safely manage excess water and prevent overtopping.
- (5) Volume 5: Hydromechanical Works, Instrumentation, and Complementary Structures
 - Focuses on the hydromechanical aspects, instrumentation, and additional structures essential for the dam's operation. It includes guidelines for installing and maintaining equipment that monitors dam performance and safety.

2.5 Summary of Additional Technical Guidelines for Dams

This section summarizes additional technical guidelines that address various specific aspects of dam construction, operation, and maintenance, complementing the broader guidelines covered earlier.

- (1) Technical Guidelines for Seepage Control in Earthfill Dams
 - (a) Objective:
 - ✓ To manage and control seepage through earthfill dams, which is crucial for maintaining structural integrity and safety.
 - (b) Key Aspects:
 - ✓ Seepage Control Measures: Techniques for controlling and reducing seepage, including the use of filters, drainage systems, and cut-off walls.
 - ✓ Monitoring: Regular inspections and monitoring systems to promptly detect and address seepage issues.

- (2) Guidelines for Dynamic Analysis of Earthfill and Concrete Dams
 - (a) Objective:
 - ✓ To evaluate the behaviour of earthfill and concrete dams under dynamic conditions, including seismic loads.
 - (b) Key Aspects:
 - ✓ Dynamic Analysis Procedures: Methodologies for assessing the response of dams to dynamic loads, such as earthquakes.
 - ✓ Seismic Safety: Ensuring that the dam design can withstand seismic forces and prevent structural failure.
- (3) Guidelines for Constructing Cut-Off Walls in Earthfill Dams
 - (a) Objective:
 - ✓ To provide detailed instructions for constructing cut-off walls to control seepage in earthfill dams.
 - (b) Key Aspects:
 - ✓ Design and Construction: Guidelines for designing and constructing effective cut-off walls to prevent seepage.
 - ✓ Material Selection: Recommendations for materials and techniques that enhance the effectiveness of cut-off walls.
- (4) Guidelines for Reservoir Sedimentation Management
 - (a) Objective:
 - ✓ To manage reservoir sedimentation, affecting dam operations and storage capacity.
 - (b) Key Aspects:
 - ✓ Sedimentation Control Measures: Strategies for reducing and managing sediment accumulation in reservoirs.
 - ✓ Monitoring and Maintenance: Regular monitoring of sediment levels and maintenance activities to address sedimentation issues.
- (5) Guidelines for Mine Waste Dams
 - (a) Objective:
 - ✓ To ensure the safe construction and management of dams associated with mine waste.
 - (b) Key Aspects:
 - ✓ Design and Construction: Guidelines specific to mine waste dams, including stability and environmental considerations.
 - ✓ Monitoring and Risk Management: Procedures for monitoring dam safety and managing risks associated with mine waste dams.

- (6) Guidelines for Dynamic Analysis of Gravity Concrete Dams
- (a) Objective:
- ✓ To evaluate the dynamic response of gravity concrete dams, particularly under seismic loading.
- (b) Key Aspects:
- ✓ Seismic Analysis: Techniques for assessing the seismic performance of gravity concrete dams.
 - ✓ Design Recommendations: Guidelines for incorporating seismic safety measures into the design of gravity concrete dams.
- (7) Manual for Visual Inspection of Earthfill Dams
- (a) Objective:
- ✓ To guide the conducting visual inspections of earthfill dams to assess their condition.
- (b) Key Aspects:
- ✓ Inspection Procedures: Detailed procedures for performing visual inspections and identifying potential issues.
 - ✓ Documentation and Reporting: Guidelines for documenting inspection findings and reporting any concerns.
- (8) Guidelines for Grouting in Dams
- (a) Objective:
- ✓ To provide instructions for grouting, a technique used to enhance the stability and watertightness of dams.
- (b) Key Aspects:
- ✓ Grouting Techniques: Methods and materials used for grouting, including grout mixes and application procedures.
 - ✓ Quality Control: Measures to ensure the effectiveness and quality of grouting operations.
- (9) 9. Guidelines for Dams on Soft Soil Foundations
- (a) Objective:
- ✓ To address the unique challenges of constructing dams on soft soil foundations.
- (b) Key Aspects:
- ✓ Foundation Design: Techniques for designing and constructing dams on soft soil to ensure stability.
 - ✓ Soil Improvement: Methods for improving soil conditions to support dam construction.

(10) General Design Criteria for Dams

(a) Objective:

- ✓ To outline general design criteria applicable to various types of dams.

(b) Key Aspects:

- ✓ Structural Design: Principles for designing dams to ensure structural integrity and safety.
- ✓ Hydrological Considerations: Guidelines for managing water flow and reservoir operations.

(11) Guidelines for Survey and Monitoring of Reservoir Sedimentation

(a) Objective:

- ✓ To provide guidance on surveying and monitoring sedimentation in reservoirs.

(b) Key Aspects:

- ✓ Survey Techniques: Methods for surveying sediment levels and assessing reservoir capacity.
- ✓ Monitoring Protocols: Procedures for ongoing monitoring and management of sedimentation.

(12) Guidelines for Roller-Compacted Concrete Dams

(a) Objective:

- ✓ To provide detailed guidance on designing and constructing roller-compacted concrete dams.

(b) Key Aspects:

- ✓ Construction Techniques: Guidelines for using roller-compacted concrete in dam construction.
- ✓ Quality Control: Measures to ensure the quality and durability of roller-compacted concrete.

(13) Guidelines for Risk Assessment in Dam Construction

(a) Objective:

- ✓ To assess and manage risks associated with dam construction projects.

(b) Key Aspects:

- ✓ Risk Assessment Procedures: Methods for identifying and evaluating potential risks.
- ✓ Mitigation Strategies: Strategies for mitigating identified risks and ensuring project safety.

2.6 Implementation and Compliance

(1) Institutional Roles and Responsibilities

- **Dam Safety Commission:** Oversees compliance with safety guidelines, conducts inspections, and manages risk assessments.
- **Ministry of Public Works and Public Housing:** Develops and updates guidelines, provides technical support, and ensures adherence to regulations.
- **Project Developers and Contractors:** Responsible for implementing guidelines during dam construction and operation.

(2) Compliance and Enforcement

- **Regulatory Compliance:** Ensures all dam projects adhere to national laws, regulations, and technical standards.
- **Inspection and Audits:** Regular inspections and audits to verify compliance with safety and operational guidelines.
- **Training and Capacity Building:** Programs to enhance the knowledge and skills of personnel involved in dam management and safety.

(3) Public Awareness and Community Engagement

- **Public Awareness Programs:** Initiatives to inform communities about dam safety and emergency preparedness.
- **Community Involvement:** Engagement with local communities to address concerns and ensure the equitable distribution of benefits.

3. Conclusion

The comprehensive set of guidelines, regulations, and technical standards provided in this report offers a robust framework for ensuring the safety, stability, and environmental sustainability of dams in Indonesia. By adhering to these guidelines, stakeholders can contribute to successfully implementing and managing dam projects while minimizing risks and enhancing the benefits of these critical infrastructure assets.

Attachment 1 : List of Collected Documents and the Contents

Tables below provides lists of the collected regulations, laws, and guidelines governing dam construction and management in Indonesia. The report is structured around various critical documents, including:

1. Guidelines for the Dam Engineering Center (Pedoman Balai Teknik Bendungan)
2. SNI (Indonesian National Standard) □ SNI (Standar Nasional Indonesia)
3. KP (Planning Criteria) in the years 1989 and 2013 versions
4. Planning Guide (Panduan Perencanaan) consisting guidelines about embankment dam planning guide.

This list consolidates essential legal and technical references that ensure Indonesian dams meet national and international safety standards. It is a crucial tool for professionals and institutions dedicated to advancing the resilience and performance of dam infrastructure across the country.

Guidelines for the Dam Engineering Center (Pedoman Balai Teknik Bendungan)

Pedoman Balai Teknik Bendungan		<i>Guidelines for the Dam Engineering Center</i>
1	PEDOMAN UNTUK MENENTUKAN KLASIFIKASI BAHAYA BENDUNGAN	<i>GUIDELINES FOR DETERMINING DAM HAZARD CLASSIFICATION</i>
2	PEDOMAN PENYIAPAN RENCANA TINDAK DARURAT	<i>GUIDELINES FOR PREPARING EMERGENCY ACTION PLANS</i>
3	TATA TERTIB SIDANG KOMISI KEAMANAN BENDUNGAN	<i>RULES OF DAM SAFETY COMMISSION ASSEMBLY</i>
4	TATA CARA UNTUK PERSETUJUAN PEMBANGUNAN & PENGHAPUSAN FUNGSI BENDUNGAN	<i>PROCEDURES FOR APPROVAL OF DAM CONSTRUCTION & REMOVAL OF FUNCTION</i>
5	PEDOMAN PENGISIAN WADUK	<i>GUIDELINES FOR FILLING THE RESERVOIR</i>
6	PEDOMAN INSPEKSI DAN EVALUASI KEAMANAN BENDUNGAN	<i>DAM SAFETY INSPECTION AND EVALUATION GUIDELINES</i>
7	PEDOMAN KAJIAN KEAMANAN BENDUNGAN	<i>DAM SAFETY ASSESSMENT GUIDELINES</i>
8	PEDOMAN PENGENDALIAN REMBESAN PADA BENDUNGAN URUGAN	<i>GUIDELINES FOR CONTROLLING Seepage in Embankment Dams</i>
9	PEDOMAN OP_PB BAG 1	<i>OP_PB GUIDELINES BAG 1</i>
10	PEDOMAN OP_PB BAG 2	<i>OP_PB GUIDELINES BAG 2</i>
11	PEDOMAN OP_PB BAG 3	<i>OP_PB GUIDELINES BAG 3</i>
12	PEDOMAN OP_PB BAG 4	<i>OP_PB GUIDELINES CHAPTER 4</i>
13	PEDOMAN OP_PB BAG 5	<i>OP_PB GUIDELINES CHAPTER 5</i>
14	PEDOMAN PENGELOLAAN SEDIMENTASI WADUK	<i>RESERVOIR SEDIMENTATION MANAGEMENT GUIDELINES</i>
15	PEDOMAN BENDUNGAN LIMBAH TAMBANG	<i>MINE WASTE DAM GUIDELINES</i>
16	PEDOMAN PELAKSANAAN KONSTRUKSI BENDUNGAN URUGAN	<i>GUIDELINES FOR IMPLEMENTATION OF CHARGE DAM CONSTRUCTION</i>
17	MANUAL INSPEKSI VISUAL BENDUNGAN URUGAN	<i>URUGAN DAM VISUAL INSPECTION MANUAL</i>
18	PEDOMAN KRITERIA UMUM DESAIN BENDUNGAN	<i>GENERAL CRITERIA GUIDELINES FOR DAM DESIGN</i>
19	PEDOMAN GROUTING UNTUK BENDUNGAN	<i>GROUTING GUIDELINES FOR DAM</i>
20	PEDOMAN PEMBUATAN DINDING HALANG (CUT-OFF) PADA BENDUNGAN URUGAN	<i>GUIDELINES FOR CONSTRUCTION OF CUT-OFF WALLS IN FILL DAM</i>
21	PEDOMAN BENDUNGAN PADA DONASI TANAH LUNAK	<i>DAM GUIDELINES ON SOFT SOIL DONATIONS</i>
22	PEDOMAN KONSTRUKSI DAN BANGUNAN-ANALISIS & DINAMIS BENDUNGAN URUGAN	<i>CONSTRUCTION AND BUILDING GUIDELINES-ANALYSIS & DYNAMICS OF ILL DAM</i>
23	PEDOMAN ANALISIS DINAMIK BENDUNGAN BETON GAYA BERAT	<i>GUIDELINES FOR DYNAMIC ANALYSIS OF HEAVY FORCE CONCRETE DAM</i>
24	PEDOMAN SURVEY DAN MONITORING SEDIMENTASI WADUK	<i>GUIDELINES FOR SURVEYING AND MONITORING RESERVOIR SEDIMENTATION</i>
25	PEDOMAN TEKNIS KLASIFIKASI BAHAYA BENDUNGAN	<i>TECHNICAL GUIDELINES FOR DAM HAZARD CLASSIFICATION</i>
26	PEDOMAN TEKNIS BUKU 1 BENDUNGAN BETON PADAT GILAS	<i>TECHNICAL GUIDELINES BOOK 1 MILLED SOLID CONCRETE DAM</i>
27	PEDOMAN TEKNIS BUKU 2 BENDUNGAN BETON PADAT GILAS	<i>TECHNICAL GUIDELINES BOOK 2 MILLED SOLID CONCRETE DAM</i>
28	PEDOMAN DESAIN DAN KONSTRUKSI BENDUNGAN URUGAN BATU MEMBRANE BETON	<i>GUIDELINES FOR DESIGN AND CONSTRUCTION OF CONCRETE MEMBRANE STONE FILL DAM</i>
28.a	LAMPIRAN A. PEDOMAN DESAIN & KNSTRKSI BEND URUGAN BATU MEMBRAN BETON	<i>APPENDIX A. DESIGN & CONSTRUCTION GUIDELINES FOR CONCRETE MEMBRANE STONE FILL BEND</i>
28.b	LAMPIRAN B. PEDOMAN DESAIN & KNSTRKSI BEND URUGAN BATU MEMBRAN BETON	<i>APPENDIX B. DESIGN & CONSTRUCTION GUIDELINES FOR CONCRETE MEMBRANE STONE FILL BEND</i>
29	PEDOMAN TEKNIS PENILAIAN RISIKO BENDUNGAN	<i>TECHNICAL GUIDELINES FOR DAM RISK ASSESSMENT</i>
29.a	LAMPIRAN PEDOMAN TEKNIS PENILAIAN RISIKO BENDUNGAN	<i>ATTACHMENT TO TECHNICAL GUIDELINES FOR DAM RISK ASSESSMENT</i>
30	PEDOMAN PERENCANAAN DAN KONSTRUKSI TEROWONGAN UNTUK BENDUNGAN	<i>GUIDELINES FOR TUNNEL PLANNING AND CONSTRUCTION FOR DAM</i>
30.a	LAMPIRAN PEDOMAN PERENCANAAN DAN KONSTRUKSI TEROWONGAN UNTUK BENDUNGAN	<i>ATTACHMENT TO GUIDELINES FOR TUNNEL PLANNING AND CONSTRUCTION FOR DAM</i>

SNI-Standar Nasional Indonesia (Indonesian National Standard)

SNI (Standar Nasional Indonesia)	SNI (Indonesian National Standard)
SNI 03-1731-1989-F Pedoman Keamanan Bendungan	<i>SNI 03-1731-1989-F Dam Safety Guidelines</i>
SNI 03-2849-1992 - Tata cara pemetaan geoteknik lapangan	<i>SNI 03-2849-1992 - Procedures for field geotechnical mapping</i>
SNI 03-2851-1991 - Tata cara perencanaan teknik bendungan penahan sedimen	<i>SNI 03-2851-1991 - Procedures for technical planning of sediment retaining dams</i>
SNI 03-3976-1995 - tata cara pengadukan pengecoran beton	<i>SNI 03-3976-1995 - procedures for mixing concrete casting</i>
SNI 03-6381-2000 - Spesifikasi bangunan ukur debit cipolleti	<i>SNI 03-6381-2000 - Building specifications for measuring cipolleti discharge</i>
SNI 03-6416-1-2000 - Spesifikasi bahan sambungan pada bendungan beton - bagian 1 pemilihan bahan penahan air	<i>SNI 03-6416-1-2000 - Specifications for connection materials in concrete dams - part 1 selection of water retaining materials</i>
SNI 03-6460.1-2000 - Tata Cara Keamanan Penerowongan Untuk Konstruksi Sipil Bagian 1 Perencanaan Dan Organisasi	<i>SNI 03-6460.1-2000 - Tunneling Safety Procedures for Civil Construction Part 1 Planning and Organization</i>
SNI 03-6460.2-2000 - Tata cara keamanan penerowongan untuk konstruksi sipil Bagian 2 Bahaya Darurat Dan Lingkungan Kerja	<i>SNI 03-6460.2-2000 - Tunneling safety procedures for civil construction Part 2 Emergency Hazards and Work Environment</i>
SNI 03-6465-2000 - Tata cara pengendalian mutu bendungan urugan	<i>SNI 03-6465-2000 - Procedures for controlling the quality of embankment dams</i>
SNI 03-6720.1-2002 - Geotekstil-Bagian 1 Tata Cara Desain Geotekstil Sebagai Filter Dan Transisi Dalam Bendungan Urugan	<i>SNI 03-6720.1-2002 - Geotextiles-Part 1 Procedures for Geotextile Design as Filters and Transitions in Embankment Dams</i>
SNI 03-6720.2-2002 - Geotekstil-Bagian 2 Tata Cara Pengukuran Lubang Dan Permeabilitas Geotekstil Sebagai Filter Dan Transisi Dalam Bendungan Urugan	<i>SNI 03-6720.2-2002 - Geotextiles-Part 2 Procedures for Measuring Holes and Permeability of Geotextiles as Filters and Transitions in Fill Dams</i>
SNI 03-7043-2004 - Tata cara desain hidraulik tubuh bendung tetap dengan peredam energi tipe MDL	<i>SNI 03-7043-2004 - Procedures for hydraulic design of fixed weir bodies with MDL type energy absorbers</i>
SNI 03-64161-2000 - Spesifikasi bahan sambungan pada bendungan beton bagian 1	<i>SNI 03-64161-2000 - Specifications for connection materials in concrete dams part 1</i>
SNI 13-4691-1998 - Penyusunan Peta Geologi	<i>SNI 13-4691-1998 - Preparation of Geological Maps</i>
SNI 19-6459-2000 - Tata Cara Pengontrolan Sedimentasi pada Waduk	<i>SNI 19-6459-2000 - Procedures for Controlling Sedimentation in Reservoirs</i>
SNI 1726-2019 - Persyaratan Beton Struktural Untuk Bangunan Gedung	<i>SNI 1726-2019 - Structural Concrete Requirements for Buildings</i>
SNI 1726-2019 Tata cara perencanaan ketahanan gempa untuk struktur gedung dan non gedung	<i>SNI 1726-2019 Procedures for earthquake resistance planning for building and non-building structures</i>
SNI 1966_2008 - Attenberg Limit	<i>SNI 1966_2008 - Attenberg Limit</i>
SNI 2411_2008 - Cara uji kelulusan air bertekanan di lapangan	<i>SNI 2411_2008 - How to test pressurized water in the field</i>
SNI 2415-2016 - Tata cara perhitungan debit banjir rencana	<i>SNI 2415-2016 - Procedure for calculating planned flood discharge</i>
SNI 2436_2008 - Tata cara pencatatan dan identifikasi hasil Pengeboran Inti	<i>SNI 2436_2008 - Procedures for recording and identifying Core Drilling results</i>
SNI 2847-2019 - Persyaratan Beton Struktural Untuk Bangunan Gedung	<i>SNI 2847-2019 - Structural Concrete Requirements for Buildings</i>
SNI 4153_2008 - Cara uji penetrasi lapangan dengan SPT	<i>SNI 4153_2008 - How to test field penetration with SPT</i>
SNI 7754_2012 - Tata cara penentuan gradasi bahan filter pelindung pada bendungan tipe urug	<i>SNI 7754_2012 - Procedure for determining the gradation of protective filter materials in fill type dams</i>
SNI 8062_2015 - Tata Cara Desain Tubuh Bendungan Tipe Urugan	<i>SNI 8062_2015 - Procedures for Body Design of Embankment Type Dams</i>
SNI 8062-2015 - Tata Cara Desain Tubuh Bendungan Tipe Urugan	<i>SNI 8062-2015 - Procedures for Body Design of Embankment Type Dams</i>
SNI 8064-2016 - Metode Analisis Stabilitas Lereng Statik Bendungan Tipe Urugan	<i>SNI 8064-2016 - Static Slope Stability Analysis Method for Fill Type Dams</i>
SNI 8460-2017 - Persyaratan perancangan geoteknik	<i>SNI 8460-2017 - Geotechnical design requirements</i>
SUMMARY-SNI-03-6720-3-2002-Tentang-Geotekstil-Bagian-3-Tata-Cara-Pemasangan-Geotekstil-Sebagai-Filter-Dan-Transisi-Dalam-Bendungan-Urugan	<i>SUMMARY-SNI-03-6720-3-2002-About-Geotextiles-Part-3-Procedures-Installing-Geotextiles-As-Filters-And-Transitions-In-Fill-Dams</i>
SUMMARY-SNI-03-6737-2002- Metode perhitungan awal laju sedimentasi waduk	<i>SUMMARY-SNI-03-6737-2002- Initial calculation method for reservoir sedimentation rate</i>

Planning Guide (Panduan Perencanaan) years 1989 version

KP (Kriteria Perencanaan) 1986	<i>KP (Planning Criteria) 1986</i>
KP-01-PERENCANAAN JARINGAN IRIGASI	<i>KP-01-IRRIGATION NETWORK PLANNING</i>
KP-02- BANGUNAN UTAMA	<i>KP-02- MAIN BUILDING</i>
KP-03-SALURAN	<i>KP-03-CHANNEL</i>
KP-04-BANGUNAN	<i>KP-04-BUILDING</i>
KP-05-PETAK TERSIER	<i>KP-05-TERTIARY LAND</i>
KP-06-PETAK BANGUNAN	<i>KP-06-BUILDING PLOT</i>
KP-07-STANDAR PENGGAMBARAN	<i>KP-07-STANDARD DRAWING</i>
PEDOMAN PENANGGULANGAN BANJIR	<i>FLOOD MANAGEMENT GUIDELINES</i>
PT (PERSYARATAN TEKNIS) 01- PERENCANAAN JARINGAN IRIGASI	<i>PT (TECHNICAL REQUIREMENTS) 01- IRRIGATION NETWORK PLANNING</i>
PT (PERSYARATAN TEKNIS) 03- PENYELIDIKAN GEOTEKNIK	<i>PT (TECHNICAL REQUIREMENTS) 03- GEOTECHNICAL INVESTIGATIONS</i>
PT (PERSYARATAN TEKNIS) 04- PENYELIDIKAN MODEL HIDROLIS	<i>PT (TECHNICAL REQUIREMENTS) 04- HYDRAULIC MODEL INVESTIGATION</i>
PT (PERSYARATAN TEKNIS) 02- PENGUKURAN TOPOGRAFI	<i>PT (TECHNICAL REQUIREMENTS) 02- TOPOGRAPHIC MEASUREMENT</i>
SPI (STANDAR PERENCANAAN TOPOGRAFI)	<i>SPI (TOPOGRAPHIC PLANNING STANDARD)</i>

Planning Guide (Panduan Perencanaan) years 2013 version

KP (Kriteria Perencanaan) 2013	<i>KP (Planning Criteria) 2013</i>
KP-01-PERENCANAAN JARINGAN IRIGASI	<i>KP-01-IRRIGATION NETWORK PLANNING</i>
KP-02- BANGUNAN UTAMA	<i>KP-02- MAIN BUILDING</i>
KP-03-SALURAN	<i>KP-03-CHANNEL</i>
KP-04-BANGUNAN	<i>KP-04-BUILDING</i>
KP-05-PETAK TERSIER	<i>KP-05-TERTIARY LAND</i>
KP-06-PETAK BANGUNAN	<i>KP-06-BUILDING PLOT</i>
KP-07-STANDAR PENGGAMBARAN	<i>KP-07-STANDARD DRAWING</i>
KP-08 Spesifikasi Teknis Kriteria Perencanaan-Standar Pintu Pengatur Air Irigasi-Perencanaan, Pemasangan, Operasi dan Pemeliharaan	<i>KP-08 Technical Specifications Planning Criteria-Standards for Irrigation Water Control Doors-Planning, Installation, Operation and Maintenance</i>
KP-09 Spesifikasi Teknis Kriteria Perencanaan-Standar Pintu Pengatur Air Irigasi-Spesifikasi Teknis	<i>KP-09 Technical Specifications Planning Criteria-Standards for Irrigation Water Control Doors-Technical Specifications</i>

**Attachment 2 : “Table of Contents” of the Collected Documents
(English Translation)**

**GUIDELINES TO DETERMINE
CLASSIFICATION OF DAM HAZARDS**

HAZARD CLASSIFICATION GUIDELINES

ATTACHMENT

DECISION OF THE DIRECTOR GENERAL OF WATER



**DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER**

NUMBER: 108/KPTS/A/1998

DATE: December 22, 1998

LIST OF CONTENTS

CHAPTER I INTRODUCTION

1.1. MeaningI-1
1.2. ObjectiveI-1
1.3. Understanding..... I-1
1.4. Notes for Users GuidelinesI-2

CHAPTER II CLASSIFICATION OF DOWNSTREAM HAZARDS

2.1. Hazard Level Classification SystemII-1
2.2. Population At Risk (PenRes) II-2
2.3. Economic Losses II-4
2.4. Sequential Dams (Multiple Dams) II-4

CHAPTER III ESTIMATION OF FLOODING AREA

3.1. General III-1
3.2. Study of existing inundationIII-2
3.3. Technical ConsiderationsIII-2
3.4. Conducting a Dam Break Analysis Study.....III-3
3.4.1. Assume a scenario regarding dam failure.....III-4
3.4.2. Determining the end point (terminal point) downstream of flood tracing
(flood routing).....III-4
3.4.3. Recommended analysis procedures.....III-4
3.4.4. Peak height and flood speedIII-5

CHAPTER IV IDENTIFICATION OF HAZARD LEVEL

4.1. General.....IV-1
4.2. Public Facilities Buildings, Workplace and Residential AreasIV-3
4.3. Mobile Homes (not common in Indonesia, currently).....IV-4
4.4. Land Road.....IV-6
4.5. Road for PedestriansIV-6
4.6. Campgrounds and Recreation Areas.....IV-6
4.7. Possible Combinations of Hazards in Various AreasIV-7
4.8. Economic LossesIV-7

**CHAPTER V CLOSING
ATTACHMENT**

**GUIDELINES FOR PREPARING EMERGENCY
ACTION PLANS**

**DECISION OF THE DIRECTOR GENERAL OF
WATERING**

NUMBER: 94/KPTS/A/1998

DATE: JULY 30, 1998



**DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER**

LIST OF CONTENTS

CHAPTER II EMERGENCY CONTROL.....	I-1
1.1. Meaning.....	I-1
1.2. Objective.....	I-1
1.3. Understanding.....	I-1
1.4. Scope.....	I-2
1.5. Introductory Provisions in Preparing Emergency Action Plan Guidelines.....	I-3
1.6. Supporting documents.....	I-4
1.7. Monitoring "Safe Limit Values" (Threshold Values).....	I-4
1.8. Revised Emergency Action Plan Guide.....	I-4
1.9. Approval of Emergency Action Plan Guidelines.....	I-5
CHAPTER II EMERGENCY CONTROL.....	II-1
2.1. Dam Collapse.....	II-1
2.1.1. Consequence.....	II-1
2.1.2. Prevention Activities.....	II-1
2.2. Dam Alert.....	II-3
2.2.1. Consequence.....	II-3
2.2.2. Prevention Activities.....	II-4
2.3. Overtopping.....	II-5
2.3.1. Consequence.....	II-5
2.3.2. Prevention Activities.....	II-5
2.4. Earthquake Alert.....	II-3
2.4.1. Consequence.....	II-6
2.4.2. Prevention Activities.....	II-6
2.5. Sabotage.....	II-7
CHAPTER III RESPONSIBILITY, NOTIFICATION AND COMMUNICATION.....	III-1
3.1. General.....	III-1
3.2. Responsibility.....	III-1
3.3. Announcement.....	III-2
3.4. Communication Instructions.....	III-3
CHAPTER IV ELECTRIC POWER, EQUIPMENT AND MATERIALS.....	IV-1
CHAPTER V FLOOD MAP	
5.1. General.....	V-1
5.2. Meaning.....	V-1
5.3. Inundation Map Overview.....	V-1
5.4. Information on the Inundation Map.....	V-2
CHAPTER VI REFUGEES	
6.1. General.....	VI-1
6.2. Existing Emergency Plans.....	VI-1
6.3. Regional Government Officials.....	VI-1
6.4. Gavar System (Warning System).....	VI-2
CHAPTER VII ENDING OF EMERGENCIES AND FOLLOW-UP	
7.1. General.....	VII-1
7.2. Follow-up.....	VII-2
CHAPTER VIII TRAINING.....	VIII-1

EMERGENCY ACTION PLAN GUIDELINES

ATTACHMENT

DECISION OF THE DIRECTOR GENERAL OF WATER

NUMBER: 94/KPTS/A/1998

DATE: JULY 30, 1998

- ATTACHMENT**
- A1 : CONTENTS OF THE GUIDELINES COMPARED TO THE CONTENTS OF THE EMERGENCY ACTION PLAN (RTD)**
 - A2 : SPECIFIC CONTENTS REGARDING EMERGENCY ACTION PLANS**
 - B : SEE LIST FOR DAM EMERGENCY PLAN**
 - C : EXAMPLE OF AGREEMENT/COMMITMENT**
 - D : CRITICAL SITUATION AND IMMEDIATE RESPONSE ACTIVITIES (ACTIONS) NEED TO BE CARRIED OUT**
 - E : EXAMPLE FORM FROM DAM OWNER/MANAGER**
 - F : SCHEMATIC NOTIFICATION CHART IN SYSTEM EMERGENCIES**
 - G : MOVEMENT ALERT**
 - F : SCHEMATIC NOTIFICATION CHART IN SYSTEM EMERGENCIES**
 - H : FLOODING MAP (EXAMPLE) ~ EVACUATING ON AREA**
 - I : CLASSIFICATION OF HAZARDS IN THE DOWNSTREAM SECTION ~ DAM ROAD CLOSURES**
 - A : EMERGENCY ACTION PLAN APPLICATION**

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
 DIRECTORATE GENERAL OF RESOURCES
 WATER POWER

**PROCEDURES FOR APPROVAL OF DAM
 CONSTRUCTION AND REMOVAL OF DAM
 FUNCTION**

OCTOBER 2002

DAM SECURITY COMMISSION

LIST OF CONTENTS

DECISION OF THE DIRECTOR GENERAL OF WATER RESOURCES
LIST OF CONTENTS i
FOREWORD iii

CHAPTER II INTRODUCTION 1

1.1. General 1
1.2. Purpose and Objectives 2
1.3. Types of Dam Safety Studies and Approvals 2

CHAPTER II Design Study 3

2.1. Preparation 3
2.2. Series of activities 4

 a. Design 4
 b. Reservoir Filling 4
 c. Reservoir Operation 4
2.3. Proposed Approvals and Materials 5
2.4. Determination of Study Teams 5
2.5. Inspection Study/Monitoring 5
2.6. Kaitian 6

 a. Preliminary Study 6
 b. Comprehensive Study 6
2.7. Study Team Suggestions 6
2.8. Follow-up Suggestions 7
2.9. Commission Technical Session 7
2.10. Follow-up on Technical Session Suggestions 7
2.11. Improvement of Study Report 7
2.12. Commission Plenary Session 7
2.13. Suggestions and Recommendations for the Plenary Session 8

CHAPTER III Changes, Rehabilitation, Expansion and Elimination of Functions 9
CHAPTER IV Independent Expert Panel 10
CHAPTER V Conditions after approval is obtained 11
CHAPTER VI Costs 12

DECISION OF THE DIRECTOR GENERAL OF WATER
RESOURCES/CHAIRMAN OF THE DAM SAFETY
COMMISSION

NUMBER: 04/KPTS/1994, jo Number: 04/KPTS/2002

About :

PROCEDURES FOR APPROVAL OF THE CONSTRUCTION
AND REMOVAL OF THE DAM'S FUNCTION

GUIDELINES FOR FILLING THE RESERVOIR

LIST OF CONTENTS

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

GUIDELINES FOR FILLING THE RESERVOIR

OCTOBER 2002

Secretariat Office
DAM SAFETY COMMISSION
(DAM SECURITY BOARD)

FOREWORD	i
LIST OF CONTENTS	ii
CHAPTER II INTRODUCTION	1
1.1. General.....	1
1.2. Purpose and objectives.....	1
1.2.1. Meaning.....	1
1.2.2. Objective.....	1
1.3. Scope of Guidelines	2
1.4. Understanding.....	2
1.5. Things that need to be considered.....	3
1.6. Validity and Limitations.....	4
CHAPTER II PREPARATION FOR FILLING THE RESERVOIR	5
2.1. Implementation Review	5
2.2. Hydrology Review	5
2.2.1. Hydrological Characteristics	5
2.2.2. Management of Rivers and River Basins	5
2.3. Aspects of Construction Implementation of Design	6
2.3.1. Design Criteria and Methods.....	6
2.3.2. Design Changes.....	6
2.3.3. Load Conditions and Safety Figures	6
2.3.4. Stability of Foundations and Support Cliffs.....	7
2.3.5. Construction Deformation.....	7
2.3.6. Seepage and Uplift	7
2.3.7. Earthquake Activity.....	8
2.3.8. Mechanical and Electrical Equipment.....	8
2.4. Instrumentation	8
2.4.1. Hydrological Observation System.....	9
2.4.2. Structure Monitoring.....	9
2.4.3. Earthquake Monitoring	9
2.4.4. Monitoring of the Dam's Pedestal Cliff.....	9
2.5. Reservoir Filling Plan.....	10
2.5.1. Social and Environmental Aspects.....	10
2.5.2. Flood Warning.....	10
2.6. Inspection and Supervision	11
2.6.1. Quality Control System.....	12
2.6.2. Examination/Inspection Schedule and Targets.....	12
2.6.3. Monitoring Methods and Fixed Procedures.....	12
2.6.4. Processing and Evaluation of Supervision Results	12
2.6.5. Data Flow, Reports, and Reporting.....	12
2.6.6. Decision-Making Process and Procedures	12
2.7. Documentation and Archives.....	13
2.7.1. Recording and Archiving	13
2.7.2. Availability and Ease of Obtaining Records/Data.....	13
2.8. Scope of Emergency Action Plan.....	13
2.8.1. Emergency Action Plan (RTD).....	13
2.8.2. Emergency Alert System.....	14

2.8.3.	Emergency Communication System	14
2.8.4.	Emergency Decision-Making Process and Procedures	14
2.8.5.	RTD Socialization and Emergency Operations Training	14
2.9.	Special Aspects of Border Rivers	14
2.9.1.	Emergency Warning On Border Rivers	14
2.10.	Disasters, Events and Extraordinary Occurrences	14
2.10.1.	Investigation and Evaluation of Work Failures and Accidents	14
2.10.2.	Accident Prevention	15
2.11.	Medical Surveillance Means	15

CHAPTER III APPLICATION FOR FILLING THE RESERVOIR16

3.1.	Application for Approval of Filling	16
3.2.	Reservoir Filling Plan Document	16
3.3.	Reservoir Filling Activity Plan	18
3.4.	Operation and Maintenance Guide to Initial Reservoir Filling	18
3.5.	Emergency Action Plan (RTD)	18
3.5.1.	RTD setup	18
3.5.2.	RTD Coverage	19
3.6.	Solving Social Environmental Problems	19
3.6.1.	Environment	19
3.6.2.	Social	20
3.6.3.	Infrastructure	20
3.6.4.	Etc.	20
3.7.	BKB Study	20

CHAPTER IV IMPLEMENTATION OF CHARGING21

4.1.	Dam Behavior Monitoring	21
4.1.1.	Monitoring	21
4.1.2.	Visual Field Inspection	22
4.1.3.	Monitoring Notes	22
4.1.4.	Charging Report	22
4.2.	Examination and Inspection	22
4.2.1.	Inspection by Dam Engineering Experts	22
4.2.2.	Inspection and Monitoring by BKB	23
4.2.3.	Independent Expert Panel	23

Reference List24

Glossary of Terms.....25

Attachment: Flowchart of Reservoir Filling Approval Procedures	26
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DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

**DAM SAFETY INSPECTION AND EVALUATION
GUIDELINES**

MARCH 2003

**Secretariat Office
DAM SAFETY COMMISSION
(DAM SECURITY CENTER)**

DAM SAFETY INSPECTION GUIDELINES

LIST OF CONTENTS

FOREWORD	i
LIST OF CONTENTS	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
APPENDIX LIST	viii
CHAPTER II INTRODUCTION	1
1.1. General	1
1.2. Purpose and Objectives	2
1.2.1. Meaning	2
1.2.2. Objective	2
1.3. Scope of Guidelines	2
1.4. Understanding	2
1.5. Validity and Limitations	3
1.6. Things that need to be considered	3
CHAPTER II TYPES OF INSPECTION	4
2.1. General	4
2.2. Based on the Inspection Implementation Method	4
2.3. Inspection carried out by the Dam Owner	5
2.4. Inspection carried out by the Center	8
CHAPTER III OBJECTIVES AND STAGES OF DAM SAFETY EVALUATION AND ASSESSMENT	9
3.1. General	9
3.2. Information on Design, Construction Implementation and Performance	9
3.3. Instrumentation Monitoring Program	13
3.4. Problem Identification and Logging	15
3.5. The study by the Follow-up Center	15
CHAPTER IV INSPECTION TEAM AND INSPECTION PROCEDURES	17
4.1. Dam Owner Internal Inspection Team	17
4.2. Hall Inspection Team	17
4.2.1. Inspection Team Members and Their Qualifications	17
4.2.2. Responsibilities and Authorities of the Inspection Team	17
4.2.3. Commission Approval of Inspection Report	18
4.3.4. Inspection Fees	18
4.3. Training Program	18
4.3.1. Inspection Period	17
4.3.2. Inspection Findings	18
4.3.3. Commission Approval of Inspection Report	18
4.3.4. Inspection Fees	18
4.4. Things Done in Inspection	18
4.5.1. Inspection Schedule	18
4.5.2. Inspected Components	19
4.5.3. Data Review	19
4.5.4. Inspection Checklist	19
4.6. Inspection Implementation Arrangements	19
4.6.1. Accommodation and Transportation	19

4.6.2. Inspection Equipment	19
4.6.3. Scheduling Activities During Inspection	20
CHAPTER V FORM OF DAM COLLAPSE AND THEIR CAUSES	22
5.1. Introduction to Forms and Causes of Collapse	22
5.2. Primary Causes of Collapses and Examples of Adverse Conditions	22
5.2.1. Foundation Damage	23
5.2.2. Damage to Spillway Buildings and Exhaust Buildings	24
5.2.3. Inadequate Seepage Control	26
5.2.4. Defective and Low-Quality Materials	27
5.2.5. Deterioration of Quality of Concrete and Steel Construction	28
5.2.6. Poor Erosion Control	29
5.2.7. Reservoir Bank Damage	30
5.2.8. Poor Construction Design or Execution	31
CHAPTER VI IMPLEMENTATION OF DAM INSPECTIONS	32
6.1. Parts and Aspects Examined	32
6.1.1. Additional Dams and Embankments	32
6.1.2. Pedestal Hill and Foundation	35
6.1.3. Reservoir	36
6.1.4. Landslide	36
6.1.5. Complementary Buildings	38
6.2. Field Inspection Notes	41
6.3. Field Discussion	42
6.3.1. Discussion with Operations Personnel	42
6.3.2. Discussion with Officers Outside the Management Agency	42

CHAPTER VII IMPLEMENTATION OF DAM INSPECTIONS	43
7.1. Parts and Aspects Examined	43
7.2. Engineering geology	43
7.3. Hydrological Design	44
7.3.1. Hydrological Characteristics and Flood Patterns	44
7.3.2. Reservoir Operation Control	44
7.3.3. Burt Water Conditions (Tail Water)	44
7.3.4. Flood Control	45
7.3.5. River Management and DPS	45
7.4. Dam Design and Behavior	45
7.4.1. Design Methods and Criteria	45
7.4.2. Load Conditions and Safety Factors	45
7.4.3. Foundation Stability	46
7.4.4. Deformation of Dams and Other Buildings	46
7.4.5. Deterioration of Material Quality	47
7.4.6. Seepage and Uplift	48
7.4.7. Reaction/Response to Earthquake	48
7.4.8. Hydro & Electromechanical Equipment	48
7.5. Instrumentation	49
7.5.1. Hydrological Observation System	49
7.5.2. Dam Monitor	49
7.5.3. Earthquake Monitoring	50
7.5.4. Pedestal Cliff Behavior Monitor	51
7.5.5. Sedimentation Monitoring	51
7.5.6. Monitoring of the Plunge Pool (Punge Pool)	51
7.6. Reservoir Operation	51

7.6.1.	Flood Discharge and Spillway Operations.....	51
7.6.2.	Reservoir Slope Stability.....	52
7.6.3.	Environmental Security Aspects.....	52
7.6.4.	Flood Warning.....	52
7.7.	Inspection Study.....	52
7.7.1.	Dam Owner/Manager Internal Inspection Team.....	52
7.7.2.	Study Schedule and Scope.....	52
7.7.3.	Inspection Methods and Routines.....	53
7.7.4.	Data Process and Evaluation.....	53
7.7.5.	Data Flow and Reports.....	53
7.7.6.	Decision-Making Process and Procedures.....	53
7.8.	Documentation and Archives.....	53
7.8.1.	Notes and Filing.....	53
7.8.2.	Data Availability and Accessibility.....	54
7.9.	Emergency Follow-up Procedures and Plans (RTD).....	54
7.9.1.	Classification of Emergency Conditions.....	54
7.9.2.	Emergency Action Plan.....	54
7.9.3.	Emergency Alert System.....	55
7.9.4.	Emergency Communications Scheme.....	55
7.9.5.	Emergency Decision Procedures and Processes.....	55
7.9.6.	Emergency Operations Training.....	55
7.10.	Border River.....	55
7.10.1.	Dam Safety.....	55
7.10.2.	Flood Control and Expenditure Debt.....	56
7.10.3.	Border DPS Management and Operational Cooperation.....	56
7.10.4.	Emergency Alert.....	56
7.11.	Dam Hazard Level Classification.....	56
7.11.1.	Classification Benchmark.....	56
7.11.2.	Flexibility and Change.....	56
7.12.	Disasters, Events, and Extraordinary Occurrences.....	56
7.12.1.	Investigation and Evaluation.....	56
7.12.2.	Repair.....	57
7.12.3.	Accident Prevention.....	57
7.13.	Financing.....	57
7.13.1.	Cost estimation.....	57
7.13.2.	Funding.....	57

CHAPTER VIII INSPECTION REPORT	58	
8.1.	General.....	58
8.2.	Contents of the report.....	58
8.3.	Conclusions and Recommendations.....	60
8.4.	Matters Considered in Report.....	61
8.5.	Things Not Included in the Report.....	62
8.6.	Signature.....	62
8.7.	Report Distribution.....	62
CHAPTER IX INSPECTION REPORT	63	
9.1.	General.....	63
9.2.	Design Evaluation, Construction Implementation, Operation & Maintenance.....	63
9.2.1.	Scope of Data Evaluation.....	63
9.2.2.	Data Availability and Data Sources.....	63
9.2.3.	Necessary data.....	63

9.3.	9.2.4. Data Review.....	64
	Technical Analysis.....	67
9.3.1.	Detailed Technical Analysis.....	67
9.3.2.	Consequences of Collapse.....	67
9.3.3.	Hydrology/Hydraulic Evaluation.....	68
9.3.4.	Geological Evaluation.....	68
	9.3.4.1. Stability Against Earthquakes.....	69
	9.3.4.2. Geotechnical Evaluation.....	69
	Reference List	71
	Glossary of Terms	73

LIST OF TABLES

Table 1	Inspection Frequency	5
Table 2	Magnitude and distance of earthquakes for extraordinary inspection	7
Table 3	Instrumentation Monitoring Schedule	14
Table 4	Classification of Dam Safety Conditions	59

LIST OF FIGURES

Figure 1	Dam Safety Evaluation Flowchart	10
-----------------	--	-----------

APPENDIX LIST

Appendix 1	Main Materials in Dam Safety Evaluation	1/12
Appendix 2	Buildings, Properties, Events, and Evidence Examined	1/7

LIST OF CONTENTS

CHAPTER I INTRODUCTION	1
1.1. General	1
1.2. Purpose and Objectives	2
1.3. Scope & Limitations	2
1.4. Understanding	3
1.5. Things that need to be considered.....	4
1.6. General requirements	6
CHAPTER II DESIGN STUDY	8
2.1. General	9
2.2. Survey and Investigation	9
2.2.1. Survey methods and scope	9
2.2.2. Geology and Engineering Geology	10
Hydrology and Hydraulic Design	11
2.3.1. Design Criteria and Methods	11
2.3.2. Hydrological Characteristics, Flood Patterns, and Surface Flow Conditions (Runoff)	12
2.3.3. Downstream Water Conditions (Tailwater)	13
2.3.4. Flooding in Downstream Areas	13
2.3.5. River Management	14
Structural Design and Behavior of Dams	14
2.4.1. Design Methods and Criteria	14
2.4.2. Load and Safety Factor	15
2.4.3. Foundation Stability	16
2.4.4. Dam Deformation	16
2.4.5. Deterioration of Material Quality	16
2.4.6. Seepage and Lift Pressure	17
2.4.7. Reaction (response) to earthquake activity	17
2.4.8. Electrical and Mechanical Equipment	18
Instrumentation	19
2.5.1. Hydrological Observation System	19
2.5.2. Structural monitoring	19
2.5.3. Earthquake monitoring	20
2.5.4. Monitoring the behavior of the hill/cliff support	20
2.5.5. Monitoring of deposition/sedimentation	21
2.5.6. Overflow stilling pond monitoring	21
Reservoir Operations	22
2.6.1. Spillway operations and flood management	22
2.6.2. Stability of reservoir cliffs	22
2.6.3. Environmental safety	22
Inspection and Field Inspection	22
2.7.1. BKB Inspection Team	22
2.7.2. Schedule and study points	23
2.7.3. Regular inspection by the owner	23
Documentation and Archiving	24
2.8.1. Document coverage	24
2.8.2. Accessibility	24
Emergency Procedures and Plans	24
2.9.1. Emergency Operation Plan	24

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

DAM SAFETY ASSESSMENT GUIDELINES

MARCH 2003

Secretariat Office
DAM SAFETY COMMISSION
(DAM SECURITY CENTER)

2.9.2.	Emergency/danger warning signs.....	39
2.10.	Security Aspects of Border Rivers.....	25
2.10.1.	Dam safety and reservoir exploitation.....	25
2.10.2.	Flood control and reservoir water release.....	26
2.10.3.	DPS cooperation and management.....	26
2.10.4.	Coordination of emergency guard/warning systems.....	26
2.11.	Criteria for Determining Dam Hazard Class.....	26
2.12.	Disaster management.....	27
2.13.	Design for Expansion, Change, Rehabilitation, Repair, and Removal of Dam Functions.....	27
2.13.1.	Design procedure.....	27
2.13.2.	Design principles and criteria.....	27

CHAPTER III CONSTRUCTION IMPLEMENTATION STUDY28

3.1.	General.....	28
3.2.	Follow Up on Suggestions.....	28
3.3.	Engineering geology.....	28
3.4.	Hydrological Design.....	29
3.4.1.	Hydrological characteristics, flood patterns, and surface runoff conditions.....	29
3.4.2.	River Management and DPS.....	29
3.5.	Dam Design and Behavior.....	29
3.5.1.	Criteria, Design, and Methods.....	29
3.5.2.	Load conditions and safety factors.....	31
3.5.3.	Foundation stability and support proof.....	31
3.5.4.	Deformation of dam bodies and other structures.....	31
3.5.5.	Seepage and uplift due to water pressure.....	32
3.5.6.	Reaction/response to earthquake activity.....	32
3.5.7.	Hydromechanical equipment.....	33
3.6.	Instrumentation.....	33
3.6.1.	Hydrological observations.....	33
3.6.2.	Dam observation.....	33
3.6.3.	Earthquake monitoring.....	34
3.6.4.	Observation of the behavior of the hill/cliff support.....	34
3.7.	Reservoir operations.....	34
3.7.1.	Social and environmental aspects.....	34
3.7.2.	Flood alert/warning.....	35
3.8.	Inspection and Supervision.....	35
3.8.1.	Hall inspection and construction supervision team.....	35
3.8.2.	Schedule and objects of inspection/inspection.....	36
3.8.3.	Methods and Routine Supervision.....	37
3.8.4.	Process and evaluate inspection results.....	38
3.8.5.	Data analysis and reports.....	38
3.8.6.	Decision-making Processes and Procedures.....	38
3.9.	Documentation and Archives.....	38
3.9.1.	Notes and archiving.....	38
3.9.2.	Data availability and accessibility.....	39
3.10.	Emergency conditions.....	39
3.10.1.	Emergency Action Plan (RTD).....	39
3.10.2.	Emergency Alert System.....	39
3.10.3.	Emergency Communication Scheme/Chart.....	39
3.10.4.	Decision-making, processes, and procedures.....	39

3.11.	Emergency operations training.....	39
3.12.	Border River.....	40
3.13.	Events and Disasters.....	40
3.14.	Disaster Prevention.....	40
3.14.	Public Health and Environmental Risks.....	40

CHAPTER IV OPERATION AND MAINTENANCE STUDY42

4.1.	General.....	42
4.2.	Engineering geology.....	42
4.3.	Hydrological Design.....	42
4.3.1.	Hydrological Characteristics and Flood Patterns.....	42
4.3.2.	Control of reservoir operations.....	43
4.3.3.	Downstream water conditions (tailwater).....	43
4.3.4.	Flood Control.....	43
4.3.5.	River Management and DPS.....	43
4.4.	Dam design and behavior.....	44
4.4.1.	Design methods and benchmarks.....	44
4.4.2.	Load conditions and safety factors.....	44
4.4.3.	Foundation stability.....	44
4.4.4.	Deformation of dams and other structures.....	45
4.4.5.	Deterioration of material quality.....	46
4.4.6.	Seepage and uplift.....	46
4.4.7.	Reaction/response to earthquakes.....	46
4.4.8.	Electro-mechanical equipment.....	47
4.5.	Instrumentation.....	48
4.5.1.	Hydrological Observation System.....	48
4.5.2.	Dam monitoring.....	48
4.5.3.	Earthquake monitoring.....	48
4.5.4.	Monitoring the behavior of the support hill.....	48
4.5.5.	Sedimentation monitoring.....	48
4.5.6.	Plunge pool monitoring.....	49
4.6.	Reservoir operation.....	49
4.6.1.	Flood discharge and spillway operations.....	49
4.6.2.	Reservoir slope stability.....	49
4.6.3.	Environmental Safety Aspects.....	49
4.6.4.	Flood Warning.....	49
4.7.	Study and inspection.....	49
4.7.1.	Review team.....	49
4.7.2.	Study schedule and scope.....	50
4.7.3.	Inspection methods and routines.....	50
4.7.4.	Process and evaluate data.....	51
4.7.5.	Data flow and reports.....	51
4.7.6.	Decision-making Processes and Procedures.....	51
4.8.	Documents and Archives.....	51
4.8.1.	Notes and archiving.....	51
4.8.2.	Data availability and accessibility.....	51
4.9.	Emergency procedures and action plans.....	52
4.9.1.	Classification of emergency conditions (KKD).....	52
4.9.2.	Emergency Action Plan (RTD).....	52
4.9.3.	Emergency warning system (SPD).....	53
4.9.4.	Emergency communication scheme (SSKD).....	53
4.9.5.	Emergency Decision (PKD) procedures and processes.....	53

4.9.6. Emergency Operations Training.....	53
Border river.....	54
4.10.1. Dam Safety.....	54
4.10.2. Flood Control and Expenditure Debt.....	54
4.10.3. Border DPS Management and Operational Cooperation.....	54
4.10.4. Emergency Alert.....	54
4.11. Dam hazard level classification.....	54
4.11.1. Classification benchmark.....	54
4.11.2. Flexibility and change.....	55
Disasters, accidents, and extraordinary events.....	55
4.12.1. Investigation and Evaluation.....	55
4.12.2. Repair.....	55
4.12.3. Accident prevention.....	55
4.13. Financing.....	55
4.13.1. Cost estimation.....	55
4.13.2. Funding.....	56
CHAPTER 5. ELIMINATION OF DAM FUNCTIONS.....	57
5.1. General.....	22
5.2. Hydrological Design.....	22
5.2.1. Hydrological Design Methods and Benchmarks.....	23
5.2.2. Hydrological Characteristics, Flood Patterns.....	24
5.3. Dam Design and Behavior.....	57
5.3.1. Design Methods and Benchmarks.....	57
5.3.2. Load conditions and safety factors.....	58
5.3.3. Foundation stability.....	58
5.3.4. Dam deformation.....	58
5.3.5. Deterioration of material quality.....	58
5.4. Instrumentation.....	58
5.5. Reservoir operations.....	58
5.6. Field Overview and Inspection.....	59
5.6.1. Supervisor and inspection team.....	59
5.6.2. Inspection methods and routines.....	59
5.7. Notes and Documentation.....	59
5.8. Emergency Action Plan (RTD).....	60
5.9. Border River.....	60
5.9.1. Flood Control.....	60
5.9.2. Joint operations and management at DPS.....	60
5.10. Funding.....	60

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

GUIDELINES

CONTROL OF SEEPAGE IN FILLED DAM

DECEMBER 2005

Secretariat Office
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LIST OF CONTENTS

FOREWORD	i
LIST OF CONTENTS	ii
APPENDIX LIST	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
CHAPTER I INTRODUCTION	
1.1. General.....	1
1.2. Purpose and Objectives.....	2
1.3. Scope.....	2
1.4. Things that need to be considered.....	2
1.5. Understanding.....	2
1.6. Validation and Limitations.....	3

CHAPTER II FORMS OF FAILURE, CRITERIA, AND SAFETY FACTORS

2.1. General.....	4
2.2. Excessive output gradient.....	6
2.3. Extreme Pore Water Pressure.....	6
2.4. High Internal Gradient without filter.....	6
2.5. Excessive seepage discharge.....	7
2.6. Desiccation cracking.....	7

CHAPTER III MATERIAL PROPERTIES

3.1. Permeability.....	8
3.2. Permeability Coefficient Parameters for Analysis.....	8
3.2.1. Permeability estimation.....	8
3.2.2. Permeability data at the design or construction stage.....	9
3.2.3. Data from laboratory test results.....	9
3.2.4. Data from field tests.....	10
3.2.5. Observation data on groundwater level fluctuations.....	10
3.2.6. Analysis result data.....	10
3.3. Anisotropy.....	10
3.3.1. Anisotropy Properties in Fill.....	10
3.3.2. Anisotropy in Foundations.....	11
3.3.3. Porosity.....	11
3.4. Hydraulic Conductivity Under Unsaturated Conditions.....	12
3.5. Soil Suction.....	12

CHAPTER IV Seepage ANALYSIS

4.1. Loading Conditions.....	13
4.2. Instructions for Selection of Analysis Methods.....	13
4.3. Numerical Methods.....	14
4.3.1. Finite Element Software (SEEP2D, SEEP3D, UNSAT2).....	15
4.3.2. Boundary Element Software.....	22
4.4. Equation and Graphical Methods.....	24
4.5. Graphic Method.....	25
4.6. Flow Net Method (Fragments).....	25
4.7. Electrical Resistance Method.....	26

CHAPTER V ELIMINATION OF DAM FUNCTIONS

5.1. Design Philosophy.....	27
5.2. Dam Body.....	28
5.2.1. Zone Division (Zoning) of the Dam Body.....	28
5.2.2. Blanket Drainage.....	28
5.2.3. Foot Drainage.....	31
5.3. Foundation.....	31
5.3.1. Downstream drainage ditch.....	31
5.3.2. Pressure Relief Wells.....	31
5.3.3. Waterproof Blanket (Upstream Blanket).....	34
5.3.4. Cutoff trench.....	34
5.3.5. Slurry Trench Cutoff.....	36
5.3.6. Diaphragm wall.....	36
5.3.7. Curtain Cement Injection.....	36
5.3.8. Repair of contact area between foundation and embankment.....	37
5.3.9. Downstream seepage berm.....	37
5.3.10. Drainage tunnel.....	37
5.3.11. Semi-horizontal borehole drainage.....	37

ATTACHMENTS

APPENDIX A: Technical properties of soil and stone materials
APPENDIX B: Equations and graphs for seepage analysis and design
APPENDIX C: Graphical method of water seepage

LIST OF TABLES

Table 1 Water seepage analysis methods	14
---	----

LIST OF FIGURES

Figure 1 Boundary conditions.....	21
Figure 2 Determination of finite elements and nodal points.....	21
Figure 3 Controlling water seepage in embankment-type dams.....	27
Figure 4 Homogeneous earth dam with chimney drain.....	29
Figure 5 Design of drain dimensions based on seepage capacity.....	30
Figure 6 Controlling erosion from soil filling into water-pass foundations.....	31
Figure 7 Locations downstream of the dam that have the potential for boiling or eruption.....	32
Figure 8 Liquefaction control with a relief well and counterweight berm.....	34

LIST OF CONTENTS

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

**GUIDELINES
DAM MAINTENANCE AND OBSERVATION
OPERATIONS**

**PART 1
GENERAL**

MARCH 2003

Secretariat Office
DAM SAFETY COMMISSION
(DAM SECURITY CENTER)

CHAPTER I INTRODUCTION1
1.1. General 1
1.2. Purpose and Objectives 2
1.3. Scope 2
1.4. Things that need to be considered 2
1.5. Validation and Limitations 3
1.6. Understanding 4

CHAPTER II OPERATION AND MAINTENANCE 7
2.1. General 7
2.2. Terms and Conditions 8
 1. Overview and Benefits 8
 2. O&M Guide Revision and Distribution 9
 3. Determination of Responsibilities 9
 4. Communication Equipment 10
 5. Implementation Guidelines and Reports 10
 6. Entrance Road to the Dam Location 11
 7. Relations with Other Agencies 12
 8. General Warning Procedures 13
2.3. Reservoir Operations 13
 1. Reservoir Storage Capacity 13
 2. Flood Design and Flood Search 13
 3. Incoming Water Forecast 14
 4. Filling Schedule and Water Dispensing Procedures 15
 5. Operating Instructions 15
 6. Flood Operations 16
2.4. Maintenance 16

CHAPTER III ORGANIZATION OF OPERATIONS & MAINTENANCE19
3.1. General 19
3.2. Organizational structure 19
3.3. Personnel 21
 1. Permanent Personnel 24
 2. Non-permanent personnel 28
3.4. Training 28
3.5. Reports and Report Flow 28
 1. General report 29
 2. Special Report 31

CHAPTER IV OPERATION AND MAINTENANCE COSTS34
4.1. General 34
4.2. Dam O & M Cost Planning 34
 1. Direct cost 35
 2. Indirect Costs 35
 3. Unforeseen expenses 36
4.3. Preparation of Funds and Sources of Funds 38

CHAPTER V EVALUATION OF O&M IMPLEMENTATION	40
5.1. General.....	40
5.2. Uses of the POP System.....	40
5.3. POP System Manual.....	41
1. OP Management Program.....	41
2. POP Implementation Schedule.....	41
3. POP Listen List.....	41
4. POP Note Cards.....	42
5. Special Occupations.....	42
5.4. Evaluation of OP implementation.....	42
1. Annual Evaluation.....	42
2. 5-Year Evaluation.....	44
5.5. Documentation and Recommendations.....	44

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

**GUIDELINES
DAM MAINTENANCE AND OBSERVATION
OPERATIONS**

**PART 2
GENERAL
MARCH 2003**

Secretariat Office
DAM SAFETY COMMISSION
(DAM SECURITY CENTER)

LIST OF CONTENTS

FOREWORDi
WELCOMEii
LIST OF CONTENTSiii
CHAPTER I INTRODUCTION.....1
1.1. General1
1.2. Purpose and Objectives2
1.3. Scope2
1.4. Things that need to be considered2
1.5. Validation and Limitations4
CHAPTER II MANUAL OF MAINTENANCE AND OBSERVATION OPERATIONS (OPP).....5
2.1. General5
2.2. Contents of the Maintenance and Observation Operation Guide5
2.3. Operations and Maintenance (O&M) Organization6
2.4. Work safety procedures6
CHAPTER III ORGANIZATION OF OPERATIONS & MAINTENANCE.....7
3.1. General7
3.2. General requirements7
3.3. Personnel10
3.4. Maintenance Procedures18
CHAPTER IV OBSERVATION (SURVEILLANCE).....23
4.1. General23
4.2. Observation activities24

LIST OF TABLES

Table 3.3.3-1 Checklist for Routine Inspections of the Embankment Dam16
Table 3.4.6-1 Soil List Check Maintenance Repairs19
Table 4.2.3-b Objects/Things Inspected for Earth fill and Rock Fill Dams29
Table 4.2.3-d Observations - Indication of Possible Damage32
Appendix A Dam Information Sheet
Appendix B Chart Ali Process for Making Dam Maintenance and Observation Operation Reports
Appendix C Dam Inspection Record Form
Appendix D Glossary of Terms

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

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OPERATIONS**

**PART 3
INSTRUMENTATION AND MONITORING SYSTEMS
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DAM SAFETY COMMISSION
(DAM SECURITY CENTER)

LIST OF CONTENTS

4.7. Strain monitoring.....	64
4.7.1. Vibrating wire strain measurement.....	64
4.7.2. Crack measurement.....	64
4.7.3. Pressure measurement.....	65
4.7.4. Load meter.....	65

LIST OF TABLES

2/1 Monitoring Parameters and Instrumentation.....	8
2/2 Instrumentation Monitoring and Inspection Schedule.....	11
3/1 Characteristics of Various Types of Piezometers.....	18
3/2 Category Deformation Measuring Instruments.....	39

LIST OF FIGURES

II-1 Flood Forecast/Warning Flow Chart.....	12
II-2 Telemetry Systems for Monitoring.....	14
III-1 Sensitivity Levels of Various Types of Piezometers with Various Permeability Conditions.....	17
III-2 Types of Open-Stand Pipe Piezometers.....	19
III-3 Schematic of the Arrangement and Working Principle of a Pneumatic Piezometer.....	21
III-4 Piezometer Head (TIP) Vibrating Wire Type Diaphragm.....	21
III-4a Typical TIP Types and Hydraulic Piezometer Installations.....	23
III-5 External View and Cross-Section of the Plate in the Total Pressure Cell.....	25
III-6 Position and Rossete system in the total pressure cell.....	26
III-7 Types of Measurement Benchmarks.....	28
(a b c)	
III-7d Design of Measurement Benchmarks on Dam Pedestal Hill.....	29
III-8 Construction of Measurement Benchmarks on Large Stone Blocks.....	30
III-9a Wire Rod Type Mechanical Crack Gauge.....	32
III-9b Calibrated Crack Monitor (CCM) Jens Avongard.....	32
III-10 Crack Monitoring Measuring Instrument.....	33
a) Types of Needles and Mechanical Extensometers	
b) Electric Type Surface Extensometer	
III-11 Separate and integrated seepage collection and measuring systems.....	35
III-13 Seepage monitoring with remote systems.....	37
a) Complete Arrangement	
b) Cross-section of Equipment with Drainage Pipe	
III-14 Arrangement of Magnetic System Subsidence Measuring Instruments or Magnetic Extensometers.....	41
III-15 Arrangement of Subsidence Measuring Instruments for Cross Arm System.....	41
a) USBR Type Arrangement or Installation	
b) USBR-type Torpedo shape estimation tool	
III-16 Arrangement of standpipes in Hydrostatic drop gauges.....	43
III-17 Inclination type Dam Deformation Measuring Instrument.....	44
a) The arrangement of the protective pipe (casing) and the principle of measurement	
b) Cross section showing tilt angle and lateral deviation	

CHAPTER I INTRODUCTION.....	1
1.1. General.....	1
1.2. Purpose and Objectives.....	1
1.3. Scope and limitations.....	2
1.4. Terms, Definitions, and Understanding.....	2
CHAPTER II DAM INSTRUMENTATION.....	4
2.1. General.....	4
2.2. Instrumentation for Monitoring.....	5
2.2.1. The purpose and function of the instrument.....	5
2.2.2. Instrument design selection criteria.....	5
2.2.3. Calibration and maintenance.....	6
2.2.4. Dam behavior parameters.....	7
2.3. Instrument Reading.....	7
2.3.1. Initial Reading.....	7
2.3.2. Training program.....	9
2.3.3. Reading frequency.....	9
2.4. Hydro-Meteorological Monitoring System.....	10
2.5. Telemetry System.....	13

CHAPTER III INSTRUMENTATION SYSTEM FOR BILL DAM.....	15
3.1. General.....	15
3.2. Pressure measuring instrument.....	15
3.2.1. Piezometer.....	15
3.2.2. Cell Total pressure.....	24
3.3. Surface motion measuring instrument.....	24
3.3.1. Survey system.....	27
3.3.2. Surface Extensometer.....	30
3.4. Seepage measuring instrument.....	34
3.4.1. How to measure.....	34
3.4.2. Tool reading.....	36
3.4.3. Test seepage water quality.....	36
3.5. Deformation measuring tool.....	38
3.5.1. Subsidence and lateral movement measuring tools.....	38
3.5.2. Pressure and strain measuring instruments.....	47
3.6. Seismic measuring equipment.....	48
CHAPTER IV CONCRETE DAM INSTRUMENTATION SYSTEMS.....	52
4.1. General.....	52
4.2. Pressure monitoring.....	52
4.2.1. Back pressure gauge.....	53
4.2.2. Pressure measuring cell.....	53
4.3. Seepage monitoring.....	54
4.4. Temperature measurement.....	54
4.5. Deformation monitoring.....	55
4.5.1. Survey system.....	55
4.5.2. Deflection Measurement.....	55
4.6. Rotation or tilt motion monitoring.....	58

III-18	Rod Extensometer with various references.....	46
III-19	Strain Gage Meter	49
a)	Arrangement and position in the dam body	
III-20	Position of the potentiometer on the extensometer	51
IV-1	Examples of SMA and Microseismograph locations in large dams.....	51
	Typical Triangulation Network Survey Measurements on concrete dams.....	56
IV-2	Working principles and typical arrangement of the combination of Hanging Dam and Floating Pendulum in arc-type concrete dam.....	57
IV-3	Hanging Pendulum Circuit/arrangement.....	59
IV-4	Floating Pendulum Circuit/arrangement	60
IV-5	Typical configuration of optical binoculars (Plummet)	61
IV-6	Typical measurements of deflection using Optical Binoculars	61
IV-7	Servo-accelerometer on electric Tietmeter.....	63
IV-8	Monitoring concrete cracks/joints with a joint-meter with a portable measuring needle system.....	66
IV-9	Joint-meter installation on concrete dams	67

APPENDIX LIST

- 1a. Examples of the layout of various types of instrumentation in embankment dams
- 1b. Examples of the layout of various types of instrumentation in the dam body
2. Example of a graph of readings/measurements on a Pneumatic Pismoeter
3. Example of a graph of Total Pressure Cell reading/measurement results
- 4a. Example of a table of measurement results for sliding stakes
- 4b. Example of graph plotting data on readings of shear stakes at the crest of dams (crest monuments)
5. Example of graph plotting joint meter reading data on an RCC (Rolling Compacted Concrete) type dam
6. Example of graph plotting seepage water monitoring data
7. Example of graph plotting data for monitoring subsidence/subsidence of magnetic rings on a magnetic extensometer
8. Example of a lateral movement monitoring data graph with an inclinometer
9. Example of a data graph for subsidence/subsidence readings with a bar extensometer
10. Example of an official report/statement regarding an earthquake, graph of recorded vibrations, and analysis

(a b c)

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

GUIDELINES

**DAM MAINTENANCE AND OBSERVATION
OPERATIONS**

PART 4

**SAFETY INSPECTION FOR HYDROMECHANICAL AND
ELECTRICAL EQUIPMENT
MARCH 2003**

Secretariat Office

DAM SAFETY COMMISSION
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LIST OF CONTENTS

**DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER**

List of contents..... i
Foreword..... ii
CHAPTER I INTRODUCTION..... 1
1.1. General..... 1
1.2. Purpose and Objectives 1
1.3. Scope..... 2
1.4. Things that need to be considered..... 2
1.5. Validity and limitations..... 2
CHAPTER II UNDERSTANDING 3
CHAPTER III GENERAL PROVISIONS FOR INSPECTION..... 14
CHAPTER IV CHECKLIST OF RAW INSPECTIONS OF EQUIPMENT AT DAM..... 35
4.1. General..... 35
4.2. Spillway Building Door 36
4.2.1. Door Leaf Condition 36
4.2.2. Condition of Lifting Equipment and Control Systems 36
4.2.3. Equipment operation..... 37
4.3. Bottom output equipment..... 37
4.4. Irrigation Output Equipment..... 38
4.5. Electrical equipment..... 38

GUIDELINES

**DAM MAINTENANCE AND OBSERVATION
OPERATIONS**

PART 5

**OPERATION AND MAINTENANCE OF HYDROMECHANICAL
AND ELECTRICAL EQUIPMENT
MARCH 2003**

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(DAM SECURITY CENTER)

LIST OF CONTENTS

CHAPTER I INTRODUCTION.....1

1.1. General.....1

1.2. Purpose and Objectives.....1

1.3. Scope.....2

1.4. Things that need to be considered.....2

1.5. Validity and Limitations.....3

CHAPTER II OPERATION AND MAINTENANCE PROVISIONS.....4

2.1. General.....4

2.2. Equipment Maintenance and Care.....5

CHAPTER III EQUIPMENT OPERATION AND MAINTENANCE.....6

3.1. General.....6

3.2. Benefits of Equipment Maintenance.....6

3.3. OP Equipment in Complementary Buildings.....9

3.3.1. Spillway Building.....9

(1) Overflow Door.....9

(2) Control equipment.....11

3.3.2. Surface Extensometer.....12

(1) Equipment Variations and Combinations.....12

(2) Doors and Valves.....13

(3) Control Equipment.....15

3.3.3. OP Auxiliary equipment.....16

(1) Bulkhead beam.....16

(2) Inspection Boat.....17

CHAPTER IV INSPECTION, MONITORING AND OPERATION TESTS.....18

4.1. General.....18

4.2. Door & Valve Operation Inspection.....18

4.3. Entire Operation of Spill Gate at High Water Level.....21

ATTACHMENT

Appendix A: Typical Maintenance Report.....23

Appendix B: Typical Daily Operations Report.....27

REFERENCE

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
 DIRECTORATE GENERAL OF RESOURCES
 WATER POWER

**RESERVOIR SEDIMENTATION MANAGEMENT
 GUIDELINES**

November 2004

Secretariat Office
 DAM SAFETY COMMISSION
 (DAM SECURITY CENTER)

LIST OF CONTENTS

4.5. TERRACE SYSTEM (TERRASSERING).....	37
4.6. REPAIR OF NATURAL CANALS	38
CHAPTER V DIVERSION OF SEDIMENT THAT WILL ENTER THE RESERVOIR	
5.1. GENERAL.....	41
5.2. PARTS OF SEDIMENT TRANSFER.....	41
5.2.1. Main Building.....	42
5.2.2. Retrieval Door Building.....	42
5.2.3. Retrieval Tunnel Building.....	42
5.2.4. Output Building (outlet).....	42
5.3. SEDIMENT TRANSFER BUILDING OPERATION PROCEDURE.....	42
5.3.1. Operation in the Rainy Season.....	42
5.3.2. Operation in the Dry Season.....	43
CHAPTER VI THE PASSAGE OF SEDIMENT THROUGH THE RESERVOIR	
6.1. GENERAL.....	44
6.2. RESERVOIR OPERATIONS FOR THE PURPOSE OF SEDIMENT PASSAGE.....	45
6.3. HYDRAULIC REQUIREMENTS.....	45
6.4. OPERATIONAL TECHNIQUES.....	46
CHAPTER VII PASSAGE OF SEDIMENT THROUGH THE RESERVOIR	
7.1. GENERAL.....	48
7.2. FLOWING SUCCESS CRITERIA.....	48
7.3. SEDIMENT BALANCE.....	40
CHAPTER VIII MECHANICAL REMOVAL OF SEDIMENT FROM THE RESERVOIR	
8.1. GENERAL.....	54
8.2. DISPOSAL METHOD.....	54
8.3. ECONOMY AND ENVIRONMENT.....	54
CHAPTER IX VEGETATIVE TREATMENT	
9.1. GENERAL.....	58
9.2. EROSION OF THE UPPER AREA.....	58
9.2.1. Rain.....	58
9.2.2. Topographic conditions.....	59
9.2.3. Geological conditions.....	58
9.2.4. Soil conditions.....	59
9.2.5. Erosion-prone/critical areas.....	59
9.2.6. Land use.....	59
9.3. LAND USE ZONING AND DESCRIPTION OF HANDLING OF THE UPPER AREA.....	60
9.4. SOIL AND VEGETATION MANAGEMENT.....	61
CHAPTER X SOCIAL HANDLING	
10.1. GENERAL.....	71
10.2. SOCIAL MANAGEMENT OF RESERVOIR SEDIMENTATION.....	72
10.2.1. Dissemination of information about regulations and legislation.....	72
10.2.2. Strengthening the implementation of regulations and legislation.....	72
10.2.3. Organizing education/training.....	73
10.2.4. Improvement/improvement of community habits.....	73
10.2.5. Giving prizes/intensive.....	74
10.2.6. Enhancing coordination and collaboration between agencies.....	74
FOREWORD.....	i
LIST OF CONTENTS.....	ii
LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii
CHAPTER I INTRODUCTION	
1.1. BACKGROUND.....	1
1.2. AIM AND OBJECTIVES OF THE GUIDELINES.....	1
1.2.1. Meaning.....	1
1.2.2. Objective.....	2
1.3. SCOPE OF THE GUIDELINES.....	2
1.4. UNDERSTANDING.....	2
CHAPTER II FACTORS AFFECTING RESERVOIR SEDIMENTATION	
2.1. GENERAL.....	6
2.2. PHYSIOGRAPHY.....	6
2.2.1. Surface soil types and geological formations.....	6
2.2.2. Land cover.....	7
2.2.3. Land use.....	7
2.2.4. Land topography.....	7
2.2.5. Drainage network density.....	7
2.2.6. River morphology.....	7
2.2.7. Sediment characteristics.....	8
2.2.8. Flow system.....	8
2.2.9. Sediment characteristics.....	8
2.2.10. The shape of a reservoir pond.....	8
2.3. HYDROCLIMATOLOGY.....	9
2.4. HUMAN ACTIVITIES IN THE CATCHMENT AREA.....	9
2.5. LAND EROSION AND SEDIMENT YIELD.....	10
2.5.1. Universal Soil Loss Equation (USLE) Method.....	11
2.5.2. Fournier method.....	15
2.5.3. Soil Erosion Design Curve Method.....	16
2.6. RESERVOIR OPERATION PATTERN.....	20
CHAPTER III RESERVOIR SEDIMENTATION MANAGEMENT STRATEGY	
3.1. GENERAL.....	21
3.2. PREPARATION OF MANAGEMENT STRATEGIES.....	21
3.2.1. Primary Criteria for Reservoir Sedimentation Treatment Intensity.....	21
3.2.2. Types of Treatment and Benchmarks of Treatment Success.....	21
3.2.3. Treatment stages and priorities.....	24
3.2.4. Reservoir sedimentation management matrix.....	25
CHAPTER IV SEDIMENT CAPTURE AT THE UPPER RESERVOIR	
4.1. GENERAL.....	27
4.2. SEDIMENT CAPTURE DAM.....	29
4.3. SEDIMENT RETAINING DAM (CHECKDAM).....	30
4.4. GULLY PLUG.....	36

10.2.7. Monitoring and evaluation	74
CHAPTER XI EFFORTS TO MONITOR RESERVOIR SEDIMENTATION	
11.1. GENERAL	75
11.2. CHANGES IN LAND USE IN THE CATCHMENT AREA	75
11.2.1. Monitoring Type.....	75
11.2.2. Monitoring Frequency.....	75
11.2.3. Monitoring Techniques	75
11.2.4. Evaluation of monitoring results	76
11.3. SEDIMENT TRANSPORT RATE INTO THE RESERVOIR.....	76
11.4. CHANGES IN THE BOTTOM ELEVATION OF THE RESERVOIR.....	76
11.4.1. Monitoring Type.....	76
11.4.2. Monitoring Frequency	77
11.4.3. Monitoring Techniques	79
11.4.4. Evaluation of Monitoring Results	79

APPENDIX LIST
BIBLIOGRAPHY

LIST OF TABLES

Table 1. Erosion factors parameters and indications of soil erosion.....	18
Table 2. Reservoir sedimentation management matrix	26
Table 3. Land use zones	60
Table 4. Typical handling of land with a slope < 40%.....	61
Table 5. Regular handling of land with a slope > 40%	61

LIST OF FIGURES

Figure 1. Erosion Factor Curve - Sediment Yield.....	19
Figure 2. Scheme for handling reservoir sedimentation	25
Figure 3. The flow of developing an old reservoir management strategy	28
Figure 4. Parts of the retaining weir.....	36
Figure 5. Typical example of gully and gully plug erosion.....	37
Figure 6. Typical terraced building	39
Figure 7. Bamboo Waterfall Building	39
Figure 8. Building a waterfall made of sandbags	40
Figure 9. Example of Asahi Dam diversion building	43
Figure 10. Typical reservoir operation via sediment bypass.....	47
Figure 11. Sediment capture efficiency curve.....	53
Figure 12. Reservoir sedimentation dredging scheme	56
Figure 13. Dredger	57
Figure 14. Typical dredger	63
Figure 15. Slope zoning and erosion management	64
Figure 16. Handling erosion on slopes <40%.....	65
Figure 17. Handling erosion on slopes >65%.....	66
Figure 18. Management of erosion on damaged forest land.....	67
Figure 19. Handling erosion on agricultural land Slope <8%.....	68
Figure 20. Handling erosion on agricultural land Slope 15 - 25%.....	69
Figure 21. Handling erosion in the waterfront area.....	70
Figure 22. Handling erosion on cliffs at the edge of the road.....	78

Figure 23. Land Use of the Upstream Area of the Sempor Reservoir.....	78
Figure 24. Grid Point Evaluation.....	80
Figure 25. Characteristics of Sempor Storage, Central Java.....	82
Figure 26. Longitudinal view of the bottom contour of the Sempor Reservoir	82
Figure 27. Ecosounding Measurement Path.....	83

LIST OF CONTENTS

LIST OF CONTENTS.....	i
LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
CHAPTER I INTRODUCTION.....	1
1.1. General.....	4
1.2. Purpose and Objectives.....	4
1.3. Scope of Guidelines.....	5
1.4. Validity and Limitations.....	5
1.5. Normative Reference.....	5
1.6. Terms and Definitions.....	5
CHAPTER II TAILINGS DISPOSAL SYSTEM.....	7
2.1. General Concept.....	7
2.1.1. Existing Holes.....	8
2.1.2. Valley Location.....	9
2.1.3. Outer Valley Location.....	9
System Components.....	11
2.2.1. Delivery System.....	12
2.2.2. Dam Body.....	13
2.2.2.1. Conventional Dam (Type A).....	14
2.2.2.2. Conventional Dam Staged Construction (Type B).....	15
2.2.2.3. Phased Construction Dam with Impervious Zone Upstream (Type C).....	16
2.2.2.4. Dam with Impervious Zone from Tailings Material (Type D).....	17
2.2.2.5. Dam with Structural Zone from Tailings Material (Type E).....	19
2.2.2.6. Tailings Dam with Shifted Upstream Construction Method Using Beach or Paddock Material (Type F).....	25
2.2.3. Limitations of the Upstream Method.....	29
2.2.4. Natural Stream Drainage.....	29
2.2.5. Deposition in Reservoirs.....	30
2.2.6. Surface Fluid Transfer.....	32
2.2.6.1. Dean's Tower.....	32
2.2.6.2. Deant with Slanted Glide Channel.....	33
2.2.6.3. Deant with Pump System.....	34
2.2.7. Pollution Control.....	34
2.2.7.1. Solid Material.....	34
2.2.7.2. Water.....	35
2.2.7.3. Gas.....	36

CHAPTER III DESIGN CONSIDERATIONS

3.1. General.....	37
3.2. Recommendation and Approval.....	38
3.3. Location Investigation.....	39
3.4. Waste Material.....	40
3.5. Special Properties of Materials – Basic Concepts.....	44
3.6. Foundational Considerations.....	45
3.7. Earthquake Considerations.....	47
3.8. Dam Design Mostly Built from Tailings Material.....	47

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

MINE WASTE DAM GUIDELINES

November 2004

3.9.	Dam construction using the peak construction method shifts to the upstream direction.....	48
3.9.1.	General.....	48
3.9.2.	Beach.....	48
3.9.3.	Sliding Style.....	48
3.9.4.	Pore Pressure and Drainage.....	49
3.10.	Dam Construction Using a Hut System.....	50
3.11.	Dams with Peak Construction Shift Downstream and Dams with Fixed Peak Axles.....	51
3.12.	Dams Built with Materials from Excavated Sources.....	52
CHAPTER IV DESIGN OF IMPORTANT PARTS OF TAILINGS DAM		
4.1.	Slope Stability Analysis.....	54
4.2.	Drainage System.....	57
4.3.	Dean System.....	58
4.3.1.	Design of Water Control Systems.....	58
4.3.2.	Decanta Tower and Launcher (Conduit).....	62
4.3.2.1.	Hydraulic Design.....	62
4.3.2.2.	Deant Tower and Launcher (Conduit).....	64
4.3.3.	Post-Closing Conditions of Operations.....	66
CHAPTER V CONSTRUCTION AND OPERATIONS CONTROL		
5.1.	Natural Conditions.....	69
5.1.1.	Climatic Conditions.....	69
5.1.2.	Type of Tailings Material.....	69
5.2.	Dean System.....	70
5.2.1.	Vertical Tower and Culvert.....	70
5.2.2.	Clutes and Conduit Pipes.....	71
5.2.3.	Connected Conduit Pipe Deans.....	71
5.2.4.	Floating Pump (Pump Barge).....	71
5.3.	Subsurface Drainage.....	72
5.3.1.	Dam Seepage Water Storage (Need Seepage Collection).....	73
5.3.2.	Artificial Waterproof Layer.....	75
5.3.3.	Filtered Wells (Filter wells).....	75
5.3.4.	Seepage Measurement.....	76
5.4.	Starter Dam.....	77
5.5.	Upstream Construction Method (Upstream Construction).....	78
5.5.1.	Beach Formation in Reservoir Pools.....	78
5.5.2.	Embankment Construction and Drainage.....	79
5.5.3.	Materials Research.....	80
5.6.	Downstream Construction Methods (Downstream Construction).....	81
5.6.1.	Formation of the Downstream Slope of the Dam.....	81
5.6.2.	Material Testing.....	82
5.7.	Construction Using Tailings with Water Management (Dewatering).....	82
5.8.	Slope Protection.....	83
5.8.1.	Protection With Stones.....	83
5.8.2.	Vegetation.....	83
5.8.3.	Inspection and Monitoring.....	84
5.9.	Quality Assurance and Emergency Action Plan.....	85
CHAPTER VI REHABILITATION AND CLOSURE		
6.1.	General.....	86
6.2.	Problems that often arise.....	86
6.2.1.	Overtopping.....	86
6.2.2.	Dam Body Slope Instability.....	86

6.2.3.	Internal Erosion Due to Seepage.....	88
6.2.4.	Internal Erosion.....	89
6.2.5.	Earthquake Damage.....	89
6.2.6.	Damage to the Expenditure System (Dean System).....	89
6.2.7.	Ground Water Pollution.....	90
	Repair Work.....	90
6.3.	General.....	91
6.3.1.	Repairs Due to Expansion.....	91
6.3.2.	Repair of Unstable Slopes.....	91
6.3.3.	Repair Work Due to Internal Erosion.....	91
6.3.4.	Repair Work Due to External Erosion.....	93
6.3.5.	Earthquake Damage Repair Work.....	94
6.3.6.	Repair Work On Dispensing Systems.....	95
6.3.7.	(Dean System).....	95
6.3.8.	Remedial Work Against Ground Water Pollution.....	95

CHAPTER VII PASSAGE OF SEDIMENT THROUGH THE RESERVOIR

7.1.	General.....	98
7.2.	Economic Considerations.....	99
7.3.	The main purpose.....	100
7.4.	Stability.....	101
7.4.1.	Slope Stability.....	101
7.4.2.	Seismicity.....	101
7.4.3.	Protection of Hill Slopes Against Internal Erosion.....	101
7.4.4.	Drainage System.....	102
7.5.	Hydrology.....	102
7.6.	Contamination.....	104
7.6.1.	Seepage Control.....	104
7.6.2.	Surface Water Quality.....	104
7.6.3.	Dust Control.....	104
7.7.	Visual Impact.....	105
7.8.	Restoration.....	105
7.9.	Security.....	106
7.9.1.	General.....	106
7.9.2.	Monitoring and Observation.....	106

CHAPTER VIII MONITORING MINE WASTE DAM

8.1.	General.....	108
8.2.	Tailings Dam with Shifted Peak Construction Upstream.....	110
8.3.	Tailings Dam with Peak Construction Shifted Downstream.....	112
8.4.	Water Storage Type Tailings Dam.....	113
8.5.	Improvement of Existing Monitoring Systems.....	113
8.6.	Monitoring of Tailings Dams That Have Been Eliminated.....	114
8.7.	Data Processing and Evaluation.....	115

CHAPTER IX OTHER PROVISIONS

9.1.	General.....	116
9.2.	Republic of Indonesia Law Number 23 of 1977 concerning: Environmental Management.....	116
9.3.	The Republic of Indonesia Government Regulation Number 18 of 1999 concerning: Management of Hazardous and Toxic Waste.....	117
9.4.	Other regulations.....	117
	Reference list.....	vii

LIST OF TABLES

Table 1 Advantages and disadvantages of various types of tailings dams.....53
 Table 2 Causes of deviations that can be identified through inspection and monitoring.....87
 Table 3 Possible corrective measures that can be used to overcome slope instability problems .92
 Table 4 Advantages and disadvantages of seepage control to prevent groundwater pollution.....96

LIST OF FIGURES

Figure 1 Diagram of the mining mineral management process.....2
 Figure 2 Example of tailings run.....3
 Figure 3 Tailings storage in unused dug holes.....8
 Figure 4 Tailings storage at the valley location.....9
 Figure 5 Distribution of tailings slurries through iron pipes.....13
 Figure 6 Type A - Conventional dam.....14
 Figure 7 Type B- Conventional dam of gradual construction.....16
 Figure 8 Type C - Staged dam with impermeable zone upstream.....17
 Figure 9 Type D- Dam with an impermeable zone made of tailings material.....18
 Figure 10 Classification of sediment material from hydro cyclones.....20
 Figure 11 Type E; - Dam construction using Construction methods
 Downstream.....21
 Figure 12 Type E2 - Dam construction using the center line method.....22
 Figure 13 Type E3 - Tailings dam with upstream construction method using cyclones.....24
 Figure 14 Type F, - Dam construction using the valve (spigot) method.....26
 Figure 15 Type F2 - Dam construction using the "sub-aerial" method.....27
 Figure 16 Type F; - Dam construction using the "paddock" method.....28
 Figure 17 Dean Tower System.....33
 Figure 18 Pump barge.....34
 Figure 19 Tailings particle size distribution curve.....Fi
 Figure 20 Tailings deposits in the reservoir pond that forms the beach.....49
 Figure 21 Mohr's circle.....56
 Figure 22 Dam construction upstream.....57
 Figure 23 Illustrative example of the water balance of a tailings storage system built using
 the paddock construction method.....59
 Figure 24 Plan of the hydrological components of the tailings containment system.....60
 Figure 25 Types of Decant Towers.....63
 Figure 26 Forces acting on the decant system tower.....65
 Figure 27 Method of placing conduit pipes in trenches to reduce stress.....66
 Figure 28 Connected conduit pipe decant.....71
 Figure 29 Example of seepage water reservoir.....74
 Figure 30 V Notch measuring instrument.....76
 Figure 31 Modified upstream construction.....78
 Figure 32 Spreading tailings using a spigot spreader.....79
 Figure 33 Ditch digging and embankment removal with heavy equipment.....80
 Figure 34 Example of spillway building during mining operations.....103
 Figure 35 Spillway building rehabilitated to accommodate flooding after mining
 operations.....103

**GUIDELINES
 IMPLEMENTATION OF FILL DAM
 CONSTRUCTION**

November 2004

LIST OF CONTENTS

LIST OF CONTENTS	i
FOREWORD	x
CHAPTER I INTRODUCTION	
1.1. General	1
1.2. Purpose and Objectives	1
1.2.1. Meaning	1
1.2.2. Objective	1
1.3. Scope of Guidelines	2
1.4. Understanding	2
1.5. Reference	3
1.6. Validity and Limitations	4
CHAPTER II PREPARATION WORK	
2.1. General	5
2.2. Implementation Organization	6
2.2.1. Project Organization	6
2.2.2. Relationship Between Project Leader, Consultant, and Contractor	7
2.3. Review and Adjustment of Design to Field Conditions	8
2.4. Program and Implementation Monitoring	8
2.5. Supervision Program	8
2.6. Quality Assurance System	9
2.7. Work safety	9
2.8. BM Measurement, Mapping, and Installation	10
2.9. Environmental Management / Monitoring Plan (RKL/RPL)	10
2.10. Preparation of Working Drawings	10
2.11. Reporting to be Prepared	10
2.12. Infrastructure and Facilities Prepared	11
2.13. Construction Supporting Infrastructure and Facilities	11

CHAPTER III RIVER ADVISORY

3.1. River Dodger Type	13
3.2. River Avoidance Procedures	13
3.3. Implementation of Circumvention Channels	14
3.3.1. Open Excavation Work	14
3.3.2. Tunnel Excavation Work	14
3.3.3. Concrete (Lining Concrete)	14
3.4. Implementation of the Pengelak Dam (Cofferdam)	15

CHAPTER IV EXCAVATION WORK AND FOUNDATION REPAIR

4.1. Foundation Excavation	17
4.2. Drying (Dewatering)	20
4.2.1. Basic consideration	20
4.2.2. Types of Drying Methods	21
4.3. Surface Foundation Repair	25
4.3.1. Rock Foundation	25
4.3.2. Sand and Gravel Foundation (Sand & Gravel Foundation)	32
4.3.3. Soil Foundation (Soil Foundation)	32
4.4. Subsurface Foundation Repair	33
4.4.1. Rock Foundation	33

4.4.2. Sand and Gravel Foundation (Sand & Gravel Foundation)	39
4.4.3. Soil Foundation (Soil Foundation)	44
4.5. Drying of Water Sources on the Foundation Surface	46
4.5.1. The water source is very small	47
4.5.2. The water source is rather large	48
4.5.3. Huge water source	48
4.5.4. Implementation of Backfill	48

CHAPTER V SOIL AND ROCK MATERIAL TAKEAWAY AREA (BORROW AREA) & QUARRY

5.1. Exploitation of Land Extraction Areas (Borrow Area)	51
5.1.1. Implementation Plan	51
5.1.2. lat Weight of Digger and Carrier	51
5.1.3. Supervision	51
5.1.4. Control Water Content	52
5.1.5. Material Mixing	52
5.1.6. Selection of Embankment Materials for Each Zone	53
5.1.7. Material Soil Granules That Are Too Large	53
5.1.8. Placement of Land Reserves (Stock Piling)	54
5.2. Quarry Exploitation	54
5.2.1. Implementation Plan	54
5.2.2. Equipment in Quarry	54
5.2.3. Test Quarry	56
5.2.4. Drilling and Blasting	57
5.3. Rehabilitation of Former Quarry Land and Borrow Area	57

CHAPTER VI DAM BODY FILLS

6.1. General	58
6.2. Type of Embankment Dam	58
6.3. Equipment For Compaction	60
6.3.1. Heavy Equipment For Compaction	60
6.3.2. Manual Compactor Tool	66
6.3.3. Spreader and Compactor Tools	66
6.4. Embankment Trial	67
6.4.1. Landfill	67
6.4.2. Rock Heap Test	67
6.5. Impermeable and Semi-Impervious Embankments	68
6.5.1. Understanding	68
6.5.2. Implementation of Compaction	69
6.5.3. Special Matters	73
6.5.4. Compaction Basics	74
6.5.5. Simple Quality Control	76
6.5.6. Compaction Quality Control	77
6.5.7. Implementation of Embankment in Unfavorable Weather	80
6.5.8. Implementation of High Water Content Core Landfill (Wet Core)	81
6.5.9. Compaction on Supported Cliffs or Concrete Construction Walls	82
6.5.10. Condensation in Limited Areas	83
Water Elapsed Embankment	83
6.6. 6.6.1. Definition	83
6.6.2. Compaction Equipment	83
6.6.3. Water Content Control	84
6.6.4. Layer Thickness and Number of Compaction Passes	84

6.6.5.	Density Requirements	84
6.6.6.	Supervision of Construction Implementation	85
6.6.7.	Evaluation of U/I Results and Follow-up	86
6.7.	Stone Fill	87
6.7.1.	General	87
6.7.2.	Hard Rocks in Rock Fill Dams	87
6.7.3.	Random Rocks	88
6.8.	Semi-Compacted Soil Fill	89
6.8.1.	Use	89
6.8.2.	Condition	89
6.8.3.	Implementation Control	89
6.9.	Sequence of Implementation of Dam Filling	89
6.9.1.	Implementation Schedule	89
6.9.2.	Stockpiling Order	90
6.9.3.	Trajectory Above the Core Zone	91
6.9.4.	Quantity Measurement	92
6.10.	Slope Protection	92
6.10.1.	Protected Area	92
6.10.2.	Upstream Slope Protection	93
6.10.3.	Downstream Slope Protection	94
6.10.4.	Surface Drainage	95
6.10.5.	Drainage in Homogeneous Fill Dams	95
6.10.6.	Foot Drainage (Toe Drains)	97
6.10.7.	Protection of Excavated Surfaces on Backings	97
6.10.8.	Saddle Dam Works	106
6.11.	Photo documentation of the implementation of the Embankment Dam	106

CHAPTER VII INSTRUMENTATION SYSTEM

7.1.	General	108
7.2.	Preparation for Procurement of Instruments	109
7.2.1.	Procurement Responsibilities	109
7.2.2.	General Specifications	109
7.2.3.	Pricing	109
7.2.4.	Technical Specifications	109
7.3.	Instrument Procurement Contract	109
7.3.1.	Target	109
7.3.2.	Instrument Installation Work Specifications	110
7.4.	Instrument Installation	110
7.4.1.	Instrument Installation Location	110
7.4.2.	Some Examples of Instrument Installation	110
7.5.	Instrument Reading	118
7.5.1.	Initial Reading of the Instrument	118
7.5.2.	Example of Procedure for Reading Several Instruments	118
7.5.3.	Routine Reading of Instruments	122
7.6.	Instrument Calibration and Maintenance	123
7.6.1.	Instrument Calibration	123
7.6.2.	Instrument Care	123

CHAPTER VIII IMPLEMENTATION OF COMPLETE BUILDINGS

8.1.	Preparatory work	124
8.1.1.	BMI Measurement, Mapping, and Benchmarks	124
8.1.2.	Installation of Stakes & Bowplank	124

8.2.	Spillway Building Construction Work	124
8.2.1.	Spillway Building	124
8.2.2.	Excavation Work	125
8.2.3.	Foundation Surface Repair Work	125
8.2.4.	Foundation Drainage Work	126
8.2.5.	Concrete Work Preparation	126
8.2.6.	Concreting Work	127
8.3.	Retrieval Building Construction Work	130
8.3.1.	Retrieval Building Type	130
8.3.2.	Implementation of Sloping Landing Building Construction	130
8.3.3.	Execution of Construction of the Retrieval Tower Building	131
8.3.4.	Implementation of Tunnel Excavation (Underground Excavation)	132
8.3.5.	Tunnel Concreting	136
8.4.	Inspection Gallery Creation Work (Grouting)	141
8.4.1.	General	141
8.4.2.	Review Inspection / Grouting Gallery Planning	141
8.4.3.	Access Gallery	142
8.5.	Blockage System	143
8.6.	Bottom Outlet	144

CHAPTER IX HYDROMECHANICAL AND ELECTRICAL WORK

9.1.	General	145
9.2.	Working Drawings & Documents That Must Be Submitted by the Implementer	145
9.3.	Material Inspection	146
9.4.	Manufacturing/Assembly Procedures and Supervision	147
9.4.1.	General	147
9.4.2.	Welding Procedures and Specifications	148
9.4.3.	Painting Specifications & Procedures	149
9.4.4.	Assembly in Workshop	154
9.4.5.	Field Installation	155
9.5.	Installation/Installation Procedures and Supervision	155
9.5.1.	Standards Used	155
9.5.2.	Scope of Test and Inspection (Scope of Test and Inspection)	156
9.6.	Hydromechanical Work Inspection	156
9.6.1.	General	156
9.6.2.	Trash Filter (Trashrack)	157
9.6.3.	Doors, Stoplogs, Valves (Gates, Stoplogs and Valves)	158
9.6.4.	Steel Pipe/Conduit Work (Steel Pipe Conduit)	161
9.6.5.	Electrical Work for Hydromechanical Equipment	165

CHAPTER X FIRST FILLING OF THE RESERVOIR

10.1.	Physical Construction Preparation	170
10.1.1.	Dam Building	170
10.1.2.	Intake Buildings and Water Channels	170
10.1.3.	Spillway Building	170
10.1.4.	Evasion Tunnel Door	170
10.1.5.	Facilities and Road Facilities	171
10.2.	Physical Preparation Not Construction	171
10.2.1.	Land Acquisition and Population Relocation	171
10.2.2.	Cutting Trees in Reservoir Flooding Areas	171
10.2.3.	Study of the Availability of Landslides in the Reservoir Area	171
10.2.4.	Wildlife Evacuation	172

10.3.	10.2.5. Reservoir Base Measurements and Boundary Marks	172
	Non-Physical and Administrative Preparation	172
	10.3.1. Reservoir Flooding Socialization	172
	10.3.2. Operation & Maintenance Manual	172
	10.3.3. Dam Operation and Maintenance Organization	172
	10.3.4. Dam Collapse Analysis	173
	10.3.5. Emergency Action Plan Guidelines.....	173
	10.3.6. Reservoir Initial Filling Guidelines	173
	10.3.7. Approval of Reservoir Initial Filling.....	173
10.4.	Things to Pay Attention to When First Filling the Reservoir.....	174

CHAPTER XI ENVIRONMENTAL MANAGEMENT AND MONITORING

11.1.	Environmental Impact on Dam Construction Implementation	175
	11.1.1. Positive impact	175
	11.1.2. Negative impact.....	176
11.2.	Project Components	176
	11.2.1. Permanent Building.....	176
	11.2.2. Temporary Building	177
	11.2.3. Other Buildings	177
11.3.	Environmental Components	177
11.4.	Greening in the Context of Environmental Improvement & Arrangement.....	178
	11.4.1. Greening of Ex Borrow Area, Quarry & Spoil Bank	178
	11.4.2. Greening of the Ex-Keria Facility	178
	11.4.3. Reforestation in the Green Belt Area	178
	11.4.4. Landscaping Around the 0 & P Building	179
11.5.	11.4.5. Native Plant Collection Garden Around the Project (Arboretum)	179
	Pay attention to Minister of Public Works Regulation No. 72/PRT/1997 concerning Dam Safety (Chapter V Management).....	179

CHAPTER XII MONITORING DAM BEHAVIOR

12.1.	General.....	181
12.2.	Monitoring System.....	181
	12.2.1. General condition	181
	12.2.2. Access Used in Emergency Conditions.....	181
	12.2.3. Dam Body Condition.....	181
	12.2.4. Conditions of the Area Around the Dam.....	182
	12.2.5. Complementary buildings	182
	12.2.6. Instrumentation.....	182
	12.2.7. Monitoring / Inspection Frequency	182
12.3.	Instrument Data Monitoring and Assessment	183
	12.3.1. Examination of Instrument Observation Data	183
	12.3.2. Seepage Observation	184
	12.3.3. Water Pore Pressure Observation.....	185
	12.3.4. Observation of Vertical and Horizontal Movements.....	186

**COMPONENT WORDS (TRANSLATION)
BIBLIOGRAPHY**

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

MANUAL

VISUAL INSPECTION OF THE FILLING DAM

November 2004

LIST OF CONTENTS
FILLING DAM VISUAL INSPECTION MANUAL

FOREWORD	i
LIST OF CONTENTS	ii
LIST OF FIGURES	vi
LIST OF PHOTOS	ix
LIST OF TABLES	x
CHAPTER I INTRODUCTION	
1.1. General.....	1
1.2. Purpose and Objectives.....	1
1.2.1. Meaning.....	2
1.2.2. Objective.....	2
1.3. Manual Scope.....	2
1.4. Normative Reference.....	2
1.5. Understanding.....	3
CHAPTER II MONITORING AND IMPORTANT PARTS OF THE DAM	8
2.1. General.....	8
2.2. Monitoring and Observation.....	9
2.2.1. Measurement/reading.....	10
2.2.2. Inspection/Visual Inspection.....	12
2.2.3. Operations Test.....	12
2.2.4. Organization, Duties, and Responsibilities.....	12
2.3. Important Parts of a Dam Project Organization.....	14
2.3.1. Dam Location.....	14
2.3.2. Foundation.....	15
2.3.3. Supporting hills/cliffs and reservoir inundation areas.....	15
2.3.4. Spillway Building.....	15
2.3.5. Production building.....	16
2.4. Types of embankment dams.....	16
2.4.1. Homogeneous soil filling.....	16
2.4.2. Zoned landfill.....	17
2.4.3. Stone backfills.....	17
CHAPTER III CONCEPTION OF VISUAL INSPECTION	
3.1. General.....	20
3.2. Things to note during the inspection.....	20
3.3. Problems that often arise.....	21
3.4. Inspection Procedures.....	21
3.5. Report format and storage.....	23
3.6. Evaluation of examination results.....	23
3.7. Preparation for inspection/inspection.....	24
3.8. Inspection/inspection equipment.....	24
3.9. Key moments for inspections.....	25
3.10. Frequency of visual checks/inspections.....	25
CHAPTER IV SEEPS	28
4.1. General.....	28
4.2. Matters that require special attention.....	28
4.3. Inspection method.....	28
4.4. Example of a seepage problem.....	29
CHAPTER V UPPER SLOPE	
5.1. General.....	36
5.2. Issues that require special attention.....	36
5.3. Inspection method.....	36
5.4. Slope materials and problems that often arise.....	37
5.5. The cause of the problem.....	38
CHAPTER VI PEAK DAM	42
6.1. General.....	42
6.2. Matters that require special attention.....	42
6.2.1. Cracked.....	42
6.2.2. Transverse crack.....	44
6.3. Example of a problem at the top of a dam.....	44
CHAPTER VII DOWNSTREAM SLOPE	
7.1. General.....	50
7.2. Matters that need special attention.....	50
7.3. Special inspection method.....	50
7.4. Material Type.....	50
7.5. Examples of problems that are often encountered in the field.....	50
CHAPTER VIII EXPENDITURE BUILDINGS	55
8.1. General.....	55
8.2. The general configuration of production buildings.....	55
8.3. Important principles.....	55
8.3.1. Cavitation.....	57
8.3.2. Dispensing Valve Location.....	57
8.3.3. Things that need attention.....	57
8.4. Inspection method.....	60
8.5. Special things that must be considered when inspecting the dispensing system.....	60
8.6. Examples of problems encountered, and actions required.....	68
CHAPTER IX SPILL BUILDINGS	
9.1. General.....	64
9.2. Main Problem.....	64
9.3. Materials Used.....	65
9.4. Inspection Procedures.....	66
9.4.1. Earthen spillway buildings and spillway buildings with control sills.....	66
9.4.2. Concrete spillway.....	66
9.5. Examples of problems encountered, and actions required.....	68
CHAPTER X EXAMINATION AROUND RESERVOIR	72
10.1. General.....	72
10.2. Hill on the edge of the reservoir.....	72
10.2.1. Landslide.....	72
10.2.2. Leaking.....	73
10.3. Garbage, floating and drifting objects.....	73
10.4. Sedimentation.....	73
10.5. Water catchment area.....	74
10.6. The area at the bottom of the reservoir.....	74
10.7. Inspection method.....	74
10.8. Inspection by Engineer.....	74
CHAPTER XI SIMPLE OBSERVATIONS ON PROBLEMS THAT ARISE	75
11.1. General.....	75

11.2.	Seepage monitoring.....	75
11.2.1.	Wet areas.....	75
11.2.2.	Measurement with a bucket and stopwatch.....	76
11.2.3.	Seepage discharge measuring instrument.....	77
11.2.4.	Turbidity and sediment measuring channels.....	78
11.2.5.	Recording.....	78
11.2.6.	Seepage that comes out of the downstream slope.....	78
11.2.7.	Observation/Observation Well.....	78
11.3.	Shear observations.....	79
11.3.1.	Alignment and decrease.....	80
11.3.2.	Cracks in embankments.....	81
11.3.3.	Landslides on embankments.....	82
11.3.4.	Concrete construction shifts.....	82
11.4.	Improved monitoring.....	83

CHAPTER XII INSPECTION OF PRINCIPAL DAM SAFETY EQUIPMENT	85	
12.1.	Inspection Instructions	85
12.2.	Elements to Check	85
12.3.	Frequent Problems	85
12.4.	Function Check	85
12.5.	Mistakes that are often made.....	86

Attachment:

1. Example: Visual Inspection/Inspection Form (Dam Inspection Note Format)
2. List of Word Synonyms (Exception)
3. Bibliography

LIST OF FIGURES

Figure 1	Concept of Dam Safety.....	8
Figure 2	Monitoring Activity Chart.....	10
Figure 3	Example of Organization and Qualifications of Dam O&M Personnel.....	13
Figure 4	Duties of Monitoring Implementers.....	14
Figure 5	Dam location.....	15
Figure 6	Sketch of Dam Location and Parts.....	16
Figure 7	Types of Embankment Dams.....	18
Figure 8	Cross view of the Filling Dam body.....	18
Figure 9	Viewing Range and Inspection Road Trajectory on the downstream Slope Parallel and Zig Zag.....	22
Figure 10	Excessive muddy water coming out of one point source.....	29
Figure 11	Excessive amount of water coming out of one source point.....	30
Figure 12	Water comes out from a source high in the fill.....	30
Figure 13	Water Coming Out of Rodent Holes.....	30
Figure 14	Water Flows Out Through Cracks Near the Peak.....	30
Figure 15	Seepage water comes out as a popup in the foundation.....	31
Figure 16	Water seepage coming out from a point adjacent to the output building.....	31
Figure 17	Leaks in/or Around the Spillway.....	31
Figure 18	Seepage from Construction Joints or Cracks in Concrete Structures.....	32
Figure 19	Leaks from Drainage Under the Spillway.....	32
Figure 20	Wet Areas in Horizontal Layers.....	32
Figure 21	Large Saturated Area.....	32
Figure 22	Seepage at the abutment cliff contact.....	33
Figure 23	Areas that are wet or flowing water.....	33
Figure 24	Visible Changes in Vegetation.....	34
Figure 25	Protrude in a large wet area.....	34
Figure 26	The effect of a trampoline in a large damp area.....	34
Figure 27	Leaks from the abutment cliff outside the dam.....	34
Figure 28	The flow of water or sediment in the drainage hole is increasing.....	35
Figure 29	Zig Zag Inspection Road Trajectory on Upstream Slope.....	37
Figure 30	Steep Slopes (Scarps), Flat Parts (Benches), Very Steep Areas (Overstep).....	38
Figure 31	Sink Hole.....	39
Figure 32	Landslide, Slump, or Slip.....	39
Figure 33	Damaged, Missing Riprap.....	39
Figure 34	Erosion Under Riprap, which is Poorly Graded.....	40
Figure 35	Large Crack.....	40
Figure 36	Shrinkage Crack.....	41
Figure 37	Activities of Large Otters or Water Rats.....	41
Figure 38	Cracks on the surface of the concrete that is deteriorating in quality.....	41
Figure 39	Longitudinal crack, which is the beginning of the dam collapse.....	42
Figure 40	Development of Transverse Cracks.....	44
Figure 41	Longitudinal Crack.....	46
Figure 42	Vertical Shift.....	46
Figure 43	Transverse Crack.....	46
Figure 44	Misalignment of Crest Shape.....	46
Figure 45	Basin at the Top of the Dam.....	47
Figure 46	Sink Hole at the Crest.....	47
Figure 47	Plants Obstructing View.....	48
Figure 48	Rodent Activities.....	48

Figure 49 Trench at the crest.....	48
Figure 50 Flow in along the crest.....	49
Figure 51 Puddles Above Poor Crest Drainage.....	49
Figure 52 Shrinkage Crack.....	49
Figure 53 Crest Elevation.....	49
Figure 54 Erosion.....	51
Figure 55 Transverse Crack.....	52
Figure 56 Longitudinal Crack.....	52
Figure 57 Landslide/Exfoliation.....	52
Figure 58 Slump (Local Conditions).....	53
Figure 59 Sink/Collapse Hole.....	53
Figure 60 Trees/Shrubs Obstructing View.....	54
Figure 61 Rodent Activity.....	54
Figure 62 Trajectories of Livestock Animals.....	54
Figure 63 Example of General Configuration of Exhaust Building with Valves/Doors Upstream.....	56
Figure 64 Example of a General Configuration of a Dispensing Building with a Valve Downstream.....	56
Figure 65 Collapse Caused by Leaks Around Exhaust Pipe.....	58
Figure 66 The reservoir becomes empty due to a leak through a hole at the upstream end of the outlet pipe.....	59
Figure 67 Turbulent flow and pressure resulting from obstacles in the pipe cause sinkholes to occur near the downstream end of the pipe.....	59
Figure 68 Damaged Outlet Pipe Damage at the End of the Spillway Chute.....	61
Figure 69 Valve Leak.....	62
Figure 70 Controlling/Regulating Equipment.....	62
Figure 71 End of Production Building.....	63
Figure 72 Water released from discharges erodes the foot of the dam.....	63
Figure 73 Drainage Holes.....	67
Figure 74 Trash/Fragments of Material or Other Obstacles.....	69
Figure 75 Concentrated Flow Due to Landslides Causing Excessive Erosion.....	69
Figure 76 Damage at the End of the Spillway Chute Channel.....	69
Figure 77 Wall Shift.....	70
Figure 78 Large Crack.....	70
Figure 79 Open or Dislocated Joints.....	71
Figure 80 Wet Area Marking.....	75
Figure 81 Bucket and Stopwatch Method (Time Counter).....	76
Figure 82a V-notch Gauge.....	76
Figure 8.2b Quadrilateral Measuring Tool.....	77
Figure 83 Example of installing a V-Notch measuring tool.....	77
Figure 84 Parshall Channel.....	77
Figure 85 Example map of leak area.....	78
Figure 86 Process of Wetting the Embankment Dam Body.....	79
Figure 87 Typical Observation Well Installation.....	79
Figure 88 Installation of Permanent Stakes.....	80
Figure 89 Alignment System Situation.....	80
Figure 90 Monitoring Cracks in Embankments.....	81
Figure 91 Landslide Monitoring.....	82
Figure 92 Measuring Shift (a,b,c,d).....	83
Figure 93 Example of Improved Monitoring.....	84

LISTPHOTO

Photo 1 Dam and accompanying buildings, rear view.....	19
Photo 2 Example on a downstream slope due to seepage, which develops into a reed flow (piping), and the slope is too steep.....	33
Photo 3 Examples of problems with concrete blocks protecting upstream slopes: deterioration in quality, opening of joints, and settlement resulting in the concrete block-breaking.....	40
Photo 4 Initial longitudinal crack at the top of the dam equipped with hearing: asphalt pavement.....	43
Photo 5 Example of a longitudinal crack at the top of the dam, which has begun to develop into vertical displacement.....	43
Photo 6 Example of surface erosion on the downstream slope of the dam.....	53
Photo 7 Irrigation dispensing system operation test.....	55
Photo 8 Dam and accompanying buildings, front view.....	64
Photo 9 Overhanging spillway floor.....	70
Photo 10 Hill near the spillway building and Tiling Dam intake.....	72
Photo 11 Upright cliff near the right support cliff, which has the potential for landslides.....	73

LIST OF TABLES

Table 1 Minimum Frequency for Visual Inspection.....	26
--	----

LIST OF CONTENTS

FOREWORD	i
LIST OF CONTENTS	ii
CHAPTER I INTRODUCTION	
1.1. General.....	1
1.2. Purpose and Objectives.....	1
1.3. Criteria Scope.....	1
1.4. Things that need to be considered.....	1
1.5. Validity and Limitations.....	2
1.6. Documents that must be prepared.....	3
CHAPTER II TYPES OF DAM	4
2.1. General.....	4
2.2. Division of Dam Types Based on Function.....	4
2.3. Division of Dam Types Based on Hydraulic Aspects.....	5
2.4. Division of Dam Types Based on Material.....	5
2.5. Landfill Dam.....	5
2.6. Rock Fill Dam.....	6
2.7. Primary and General Criteria.....	6
2.8. Selection of Location and Type of Dam.....	7
CHAPTER III SURVEY AND INVESTIGATION	10
3.1. General.....	10
3.2. Topographic Survey.....	10
3.3. Geological Investigations.....	11
3.4. Material Investigation.....	15
3.5. Earthquake Studies.....	17
3.6. Socio-Economic and Environmental Studies and Population Displacement.....	19
CHAPTER IV HYDROLOGY	20
4.1. Hydrological and Meteorological Data Collection.....	20
4.2. Data Check.....	20
4.3. Probability Analysis of Design Butresses.....	20
4.4. Design Flood Estimates from Rainfall Data.....	20
4.5. Reservoir Water Availability.....	21
4.6. High Guard.....	21
4.7. Sedimentation.....	21
CHAPTER V LOADS	25
5.1. Loads Acting on Embankment Dams.....	25
5.2. Own Weight.....	26
5.3. Hydrostatic Pressure.....	26
5.4. Pore Water Pressure.....	27
5.5. Earthquake Load.....	29
5.6. Conditions and Load Combinations and Safety Factors.....	30
5.7. Minimum Safety Factor Criteria.....	30
CHAPTER VI FOUNDATION DESIGN	32
6.1. General.....	32
6.2. Types of Dam Foundations.....	32

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

GUIDELINES
GENERAL CRITERIA FOR DAM DESIGN

MARCH 2003

Secretariat Office
DAM SAFETY COMMISSION (DAM SECURITY BOARD)

6.3.	Rock Foundation	33
6.4.	Coarse-Grained Material Foundation.....	35
6.5.	Fine-Grained Material Foundation.....	38

CHAPTER VII EARTH FILL DAM

7.1.	General	39
7.2.	Dam Crest.....	39
7.3.	Protection of Dam Slopes.....	40
7.4.	Filters and Transitions.....	41
7.5.	Hoarding Design.....	43

CHAPTER VIII STONE FILL DAM

8.1.	General	48
8.2.	Application	48
8.3.	Foundation Design	50
8.4.	Barrier Trench	51
8.5.	Backfill Design.....	52
8.6.	Membrane Design	54

CHAPTER IX SPILL BUILDINGS

9.1.	General.....	57
9.2.	Overflow Function and Its Selection.....	57
9.3.	Output Capacity	57
9.4.	Control Building	58
9.5.	Carrier Channel	60
9.6.	Energy Damper	61
9.7.	Overflow Building Type	65
9.8.	Spillway Building with Sluice Gate.....	66
9.9.	Model Study	66

CHAPTER X INSTRUMENTATION

10.1.	General.....	68
10.2.	Production Building Type.....	68
10.3.	Retrieval Mouth Type	68
10.4.	Production Buildings in the Form of Conduits.....	69
10.5.	Underground Pipes and Drains	70

CHAPTER XI INSTRUMENTATION

11.1.	General.....	71
11.2.	Purpose of Instrumentation Installation and Factors Causing Dam Damage.....	71
11.3.	Instrumentation Criteria	72
11.4.	Required Dam Instrumentation.....	72
11.5.	Types of Dam Instruments	73

CHAPTER XII RIVER FLOW DIVERSION WORK.....

12.1.	Method	76
12.2.	Dodge Building	77

CHAPTER XIII MISCELLANEOUS.....

13.1.	Things That Must Be Included in Design Criteria.....	78
13.2.	Backfill Dam Technical Specifications	78

GLOSSARY OF TRANSLATION TERMS

		79
--	--	----

BIBLIOGRAPHY SOURCES	85
-----------------------------------	-----------

LIST OF TABLES

Table 3-1	Types of Embankment Dam Material Tests	17
Table 5-1	Conditions and Load Combinations and Minimum Safety Factors	27
Table 7-1	Relationship Between Base Soil Types and Filter Criteria.....	41
Table 9-1	Types and Components of Spillway Buildings.....	57
Table 11-1	Advantages and Limitations of Pisometer Types.....	73

LIST OF FIGURES

Figure 1	Section of an Earthfill Type Dam.....	23
Figure 2	Rock Fill Type Dam.....	24
Figure 3	Methods for controlling water seepage in embankment dams.....	37
Figure 4	Effect of upstream membrane on backfill resistance to shear.....	47
Figure 5	Detail of the asphalt concrete membrane on the barrier ditch	49
Figure 6	Details of the concrete barrier wall and dowelled toe slab	56
Figure 7	Detail of the steel plate membrane on the barrier trench wall	50
Figure 8	USBR stilling pool.....	64

LIST OF CONTENTS
GROUTING GUIDELINES FOR DAM

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

CHAPTER I General	
1.1. Background	1
1.2. Purpose and Objectives	1
1.3. Scope of Guidelines	1
1.4. Understanding	2
1.5. Normative Reference	3
1.6. Validity and Limitations	3
CHAPTER II History and Function of Grouting	
2.1. History of Grouting Methods in Dams	4
2.2. Grouting Function	5
CHAPTER III Geological Investigation	
3.1. Types of Dams and Types of the Foundation	8
3.2. Geological Considerations	9
3.2.1. Geological Structure Considerations	9
3.2.2. Rock Discontinuity Considerations	11
3.3. Geological Investigation for Grouting	12
3.3.1. Lugeon Value & Permeability Test	12
3.3.2. Core Drilling	17
3.3.3. Grouting Trial	18
3.4. Consideration of whether or not grouting is necessary	19
3.4.1. General	19
3.4.2. Foundation Carrying Capacity	19
3.4.3. Seepage in Foundations	20
3.4.4. Determining the Need for Grouting	22
3.5. Determining the Target Final Result of Grouting Work	25

CHAPTER IV Grouting Based on Theory

4.1. General	26
4.2. Grouting of alluvial foundations	26
4.2.1. Theory	26
4.2.2. Grouting Penetration Speed	29
4.2.3. Blockage Criteria	31
4.2.4. Grouting using the hydraulic fracturing method	33
4.2.5. Viscosity Time Equation	35
4.3. Grouting in Rock	37
4.3.1. Optimization of Grouting Hole Orientation	37
4.3.2. Mechanical Requirements Of Grouting	41
4.3.3. Equation of Grouting Flow Through Rock Fractures	43
4.3.4. Determination of Fracture Width	45

CHAPTER V Grouting Mix Plan

5.1. Grouting Materials	49
5.2. Classification of Grouting Mixtures	49
5.2.1. Classification in General	49
5.2.2. Technical Classification	49
5.2.3. Rheological Classification	51

GUIDELINES
GENERAL CRITERIA FOR DAM DESIGN

DECEMBER 2005

5.3.	Grouting Penetration Ability.....	51
	5.3.1. Rough Grouting.....	51
	5.3.2. Smooth Grouting.....	52
5.4.	Grouting Mix Development.....	53
	5.4.1. Fluidity.....	53
	5.4.2. Bleeding Potential.....	55
	5.4.3. Gelation, Rigidity, and Thixotropy.....	56
	5.4.4. Strength and Graduation.....	56
CHAPTER VI Cement Grouting		
6.1.	General.....	59
6.2.	Grout Characteristics.....	59
	6.2.1. Pure Cement.....	59
	6.2.2. Cement with Bentonite.....	66
	6.2.3. Cement with Fly Ash.....	68
	6.2.4. Cement and Additional Materials.....	68
	6.2.5. Sand Cement Grout.....	73
	6.2.6. Clay Bentonite Cement.....	75
6.3.	Freezing Mechanism and Hygroscopic Properties.....	80
6.4.	Binghamian Grout Flow Mechanism.....	83
6.5.	Interaction with Foundation Formation.....	84

CHAPTER VII Chemical Fine Grout

7.1.	General.....	85
7.2.	Chemical Grout Cytate.....	85
	7.2.1. Sodium Silicate.....	86
	7.2.2. Lignosulfate Derivatives.....	87
	7.2.3. Polyacrylamides.....	87
	7.2.4. Phenoplast.....	89
	7.2.5. Aminoplast.....	89
	7.2.6. Polyurethane.....	89
	7.2.7. Epox.....	89
	7.2.8. Other Grout Systems.....	90
7.3.	Mechanism of Gel Formation and Microscopic Behavior.....	91
	7.3.1. Sodium Silicate.....	91
	7.3.2. Urea Formaldehyde.....	92
	7.3.3. Resorcinol Formaldehyde.....	93
	7.3.4. Polyurethane.....	93
	7.3.5. Epox.....	94
7.4.	Flow Mechanism.....	95
7.5.	Force Interactions.....	98
7.6.	Rheological Behavior of Grouting Systems.....	100

CHAPTER VIII Grouting Techniques in the Field

8.1.	Types of Grouting in Dams.....	101
8.2.	Location of Grouting Holes.....	101
	8.2.1. Curtain Grouting Position.....	102
	8.2.2. Application to several dams in Indonesia.....	103
8.3.	Implementation Method.....	104
	8.3.1. Phased Grouting Method.....	104
8.4.	Grouting Pattern.....	111
	8.4.1. Curtain Grouting.....	111

	8.4.2 Consolidation Grouting.....	113
8.5.	Sequence of Grouting Relating to Hole Pattern.....	114
8.6.	Curtain Grout Depth.....	116
8.7.	Grouting Pressure.....	117
	8.7.1. Practical Standards for Grouting.....	117
	8.7.2. Practice in Indonesia.....	127
	8.7.2.1. Grouting Pressure.....	127
	8.7.2.2. Estimated Grouting Pressure.....	127
	8.7.2.3. Limitations of Grouting Completion with Lugeon.....	130

CHAPTER IX Grouting Applications in Dams

9.1.	Preparation.....	131
	9.1.1. Grouting Point Preparation.....	131
	9.1.2. Warehouse Preparation.....	132
	9.1.3. Place for Mixing Grouting Materials.....	132
	9.1.4. Surface Protection for Grouting.....	133
	9.1.5. Preparation of Work Scaffolding.....	135
	9.1.6. Lift Monitoring Device.....	135
9.2.	Types of Grouting in Dams.....	136
	9.2.1. Grouting Curtains.....	136
	9.2.2. Consolidation Grouting.....	137
	9.2.3. Grouting Blankets.....	137
	9.2.4. Shotcreting.....	138
	9.2.5. Guniting.....	138
9.3.	Pressure Grouting Procedure.....	139
	9.3.1. Grouting Procedure.....	139
	9.3.2. Grouting Work Sequence.....	141
	9.3.3. Description of Each Activity.....	142
9.4.	Procedure for Implementing Spray Grouting.....	146
	9.4.1. General Description.....	146
	9.4.2. Implementation of Spray Grouting.....	148
9.5.	Grouting at High Ground Water Pressure.....	149
	9.5.1. Investigation of the position and size of groundwater.....	149
	9.5.2. Grouting Pressure Monitoring.....	150
	9.5.3. Monitoring gel time of grout mixture.....	151

CHAPTER X Application of Grouting in Supporting Buildings

10.1.	Dam Supporting Buildings.....	152
10.2.	Type of Grouting Done.....	153
10.3.	Implementation Procedures.....	153
	10.3.1. Filler Grouting.....	153
	10.3.2. Consolidation Grouting.....	155
	10.3.2.1. Implementation in Tunnels.....	155
	10.3.2.2. Implementation in Open Space.....	156
	10.3.3. Contact Grouting.....	156
	10.3.3.1 Avoidance Tunnel Blockage Contact Grouting.....	157
	10.3.4. Radial Grouting.....	158

CHAPTER XI Materials and Equipment

11.1.	Material for Drilling.....	160
11.2.	Materials for grouting.....	161
11.3.	Grouting Drilling Equipment.....	163

H. Table 4	Grouting Planning (a,b,c,d,e,f,g,h,i, and j) according to dam type.....	192
I. Tables 5 & 6	:Geological examples related to Consideration Specific Geology.....	198
J. Table & 8	- Instructions for Curtain Grouting selection as a function of the main type of site (ground) :Data on the Strength of Sand Grouted with Silicate and Resin.....	202
K. Discussion I	:Rheological Behavior of Grouting Mixtures	203
	1. General description.....	205
	2. Grouting System Design Approach.....	205
	2.1. Keria Framework Approach.....	205
	2.2. Conceptual Framework Approach.....	203
	2.3. Equivalent Weight Approach.....	207
	3. Coarse Grout.....	208
	3.1. Cement Grout.....	208
	3.2. Neat Cement Grout with Admixtures.....	210
	3.3. Cement - Bentonite and Cement – Clay Grout.....	213
	3.4. Sand - Cement Grout.....	214
	3.5. Cement - Fly Ash Grout.....	217
	4. Chemical Grout.....	220
	4.1. Sodium Silicate.....	220
	4.2. Urea – Formaldehyde.....	225
	4.3. Resoretnol Formaldehyde.....	230
	4.4. Polyurethane.....	235
	4.5. Epoxy.....	239
	4.6. Summary.....	241
L. Figure 174 ~177:	Stand Pipe and Grout Cap.....	242
Figure 178 ~ 182:	Reinforcement Pipe	243
Figure 183	: Grouting Gallery.....	244
M. Discussion II	: Laboratory and Field Testing for Grouting	245
	1. Types of Testing in the Laboratory and in the Field	245
	1.1 Viscosity Test.....	245
	1.2. Precipitation Test.....	246
	1.3. Specific Weight Test.....	247
	1.4. Cohesion Test.....	248
	2. Cement testing.....	25
	2.1 Cement Specific Weight Test.....	253
	2.2 Smoothness Test.....	255
	2.3 Cement Freezing Test.....	255
	2.4 Hardness Test.....	259
	3. Hydraulic Fracturing Test.....	259
	4. Grouting Test in the Field.....	260
	4.1 General.....	260
	4.2 Location of Grouting Test.....	260
	4.3 Pattern / Arrangement of Grouting Test Points.....	261
	4.4 Specifications for Implementing Grouting Tests	262
	4.4.1 Core Drilling.....	262
	4.4.2 Implementation of Grouting.....	263
	4.4.3 Recording that needs to be done.....	264
N. Discussion III	: Examples of Grouting Applications in Dams	271
	1. Karangates Hum.....	271

12.1.	General.....	165
12.2.	Control Grouting Operations.....	165
12.3.	Evaluation of Grouting Effectiveness.....	165
	12.3.1. General Criteria.....	166
	12.3.2. Several Specific Criteria.....	166
	12.3.3. Statistical Evaluation of Grouting Data.....	167
	12.3.4. Thematic Evaluation of Grouting Work.....	170
12.4.	Evaluation of the Effectiveness of Grouting	171
	12.4.1. Effectiveness of grouting implementation.....	171
	12.4.2. Effectiveness in the ability to reduce seepage discharge.....	172
12.5.	Curtain Grout Efficiency.....	173
12.6.	Example of Application and Evaluation of Grouting Results.....	175

CHAPTER XIII Technical Specifications for Grouting Works		
13.1.	General.....	176
13.2.	Materials for Grouting.....	176
13.3.	Equipment.....	177
	13.3.1. Drilling Equipment.....	177
	13.3.2. Water Pressure Test Equipment.....	177
	13.3.3. Equipment For Grouting.....	178
	13.3.4. Pipe Stands.....	178
13.4.	Drilling and Grouting in Open Foundations.....	179
	13.4.1. Consolidation Grouting.....	179
	13.4.2. Contact Grouting.....	180
	13.4.3. Test Hole Core Drilling.....	181
	13.4.4. Borehole Permeability Test.....	182
	13.4.5. Water Pressure Test.....	182
	Measurement and Payment.....	183
13.5.	13.5.1. Drilling to depth.....	183
	13.5.2. Consolidation Grouting Work.....	183
	13.5.3. Grout Material.....	183
	13.5.4. Contact Grouting.....	183
	13.5.5. Pilot Hole and Check Hole.....	183
	13.5.6. Water Pressure Test.....	184

ATTACHMENT :

A. Table 1	:List of Large Dams in Indonesia with.....	185
B. Table 2	:Foundation Repair Using the Grouting Method. Geological Considerations for Dams & Their Foundations.....	186
C. Figure 3-6	:Various Geological Structures That Play a Role Weak Zone Prone to Leaks.....	187
D. Figure 7	:Properties of Joints and Grouting Behavior in Rock.....	188
E. Figure 8	:Ali Chart Engineering Geological Investigation and Their Interrelationships.....	190
F. Figure 9	:Permeability Testing through Drilled Holes with Packer.....	191
G. Table 3	:Various Engineering Properties of Soil and Rock are related	

1.1 Overview	271
1.2 Geology	271
1.3 Foundation Repair	271
2. Selorejo Dam.....	282
2.1 Overview	282
2.2 Geology	282
2.3 Foundation Repair.....	282
2.4 Curtain Grouting	282
2.5 Ram Grouting	283
2.6 Use of Materials in Curtain Grouting.....	284
2.7 Improvement of Permeability by Grouting.....	284
2.8 Conclusion	285
O. Attachment : Bibliography	287

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

GUIDELINES

**CONSTRUCTION OF A CUT-OFF WALL ON THE
EMBANKMENT DAM**

DECEMBER 2005

LIST OF CONTENTS

4.12. Panel Connections.....	28
4.13. Relationship With Existing Construction.....	29
4.14. Losing Slurry.....	32
4.15. Field Preparation.....	32
4.16. Casting concrete.....	33
4.16.1. Transportation.....	33
4.16.2. Tremie Method.....	33
4.17. Construction Implementation Control.....	33
4.18. Employment Plans and Intentions Report.....	35
4.19. Measurement And Payment.....	35
CHAPTER V BENTONITE SLURRY BARRIER WALLS - CEMENT	
5.1. General.....	37
5.2. Bentonite-Cement Slabs.....	37
5.3. Trench Stability During Construction.....	38
5.4. Permeability of Barrier Walls.....	38
5.5. Relationship Between Bentonite Cement Wall and Core Zone.....	39
5.6. Implementation Control.....	39
CHAPTER VI OTHER TYPES OF BARRIER WALLS	
6.1. General.....	41
6.2. Pile Wall.....	41
6.3. Superposed Concrete Galleries.....	45
6.4. Thin Barrier Wall (Vib, Slim Vibrated Cutoff).....	45
GLOSSARY OF TRANSLATION TERMS.....48	
BIBLIOGRAPHY SOURCES	

LIST OF TABLES

Table 1 Main Characteristics of Barrier Walls (ICOLD, Bulletin 29, 2005).....	4
Table 2 Material Characteristics for Dining Diaphragms (ICOLD, Bulletin 129, 2005).....	4
Table 3 Typical Gradation Limits for Slurry Trench Backfill Material.....	6
Table 4 Increase in Density of Bentonite Slices.....	8

LIST OF FIGURES

Figure 1 Mixing equipment and barrier wall construction (ICOLD 1985).....	15
Figure 2 How to Implement Trench Slurry.....	16
Figure 3 Implementation of Trench Slurry with Draglines and Clamshells (ICOLD 1985).....	16
Figure 4 Technique for Making Bentonite-Soil Slurry Trench Barrier Walls (ICOLD 1985).....	17
Figure 5 Concrete Barrier Wall or Concrete Diaphragm Wall 1) Excavation; 2) Concreting; 3) Watertight Foundation Layer; 4) Water Permeable Foundation Layer (ICOLD 1985).....	20
Figure 6 Example of Concrete Dining Barrier Construction Implementation Stages Carried Out in 4 Stages: 1) Excavation; 2) Installation of Casting Barrier Steel Pipes; 3) Installation of Reinforcement; 4) Concreting (Xanthakos 1979).....	23
Figure 7 Triaxial Test on Plastic Concrete (ICOLD 1985).....	25

FOREWORD.....i	i
LIST OF CONTENTS.....ii	ii
LIST OF TABLES.....v	v
LIST OF FIGURES.....vi	vi
CHAPTER I INTRODUCTION	
1.1. General.....	1
1.2. Purpose and Objectives.....	1
1.3. Criteria Scope.....	1
1.4. Normative Reference.....	1
1.5. Understanding.....	1
1.6. Validity and Limitations.....	2
CHAPTER II APPLICATION OF BARRIER WALLS IN EMBANKMENT DAM	
2.1. General.....	3
2.2. Effectiveness of Barrier Walls.....	3
2.3. Types of Barrier Walls.....	3
2.4. Instrumentation.....	4

CHAPTER III BENTONITE SLARI BARRIER WALLS - SOIL

3.1. General.....	6
3.2. Slari Mixed Design.....	7
3.3. Slari's Nature.....	8
3.3.1. Density.....	8
3.3.2. Viscosity.....	9
3.3.3. Gel Strength (Jelly).....	10
3.3.4. Filtration Loss.....	10
3.4. Trench Stability During Excavation.....	10
3.5. Permeability of Barrier Walls.....	11
3.6. Mixed Design of Backfill Materials for Barrier Walls.....	11
3.7. Connection Between Backfill of Barrier Wall and Dam Core.....	12
3.8. Construction Implementation Control.....	13
3.8.1. Slurry Mix.....	13
3.8.2. Backfill Material Mixture.....	14
3.8.3. General Construction Implementation.....	14
3.9. Measurement For Payment.....	16

CHAPTER IV CONCRETE BARRIER WALLS

4.1. General.....	18
4.2. Application.....	19
4.3. Exploration.....	20
4.4. Properties and Design of Slurry Mixtures.....	20
4.5. Guide Walls.....	21
4.6. Panel Size.....	21
4.7. Vertical Tolerance.....	23
4.8. Concrete Mix.....	24
4.9. Waterproof Level.....	25
4.10. Test Before Implementation.....	26
4.11. Digging Equipment.....	26

DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER

**CONSTRUCTION OF EMBANKMENT DAM ON
SOFT SOIL FOUNDATIONS**

Decision of the Director General of Water Resources
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DEPARTMENT OF GENERAL WORKS
DIRECTORATE GENERAL OF WATER RESOURCES

Figure 8 Long Wall Drill Tone Used in Excavating the Diaphragm Wall at the Left Support of the Wonorejo Dam. Dining Diaphragm Making is Carried Out From Inside the Horizontal Tunnel.....	27
Figure 9 Hydraulic Kelly Grab Used in Excavation for Diaphragm Walls at Penjalin Dam	28
Figure 10 Bentonite juice that is pumped from a trench pit and then temporarily stored in a sliding pond.....	28
Figure 11 a) & b) : Excess Casting Due to Excess Excavation; c), d), e) : Panel Connections with c) Single Key Joint, d) Double Key Joint, e) Water Seal (Xanthakos, 1979).....	30
Figure 12 Example of a Boulder Breaking Chisel in an Excavated Hole.....	31
Figure 13 Example of Excavation Using the Single Stage Method with a Clamshell Bucket: 1) First Dig Pass (1s Pass/Bite); 2) Second Excavation Track; 3) Last Excavated Track (Xanthakos 1979)	31
Figure 14 Example of Excavation Using the Two Stages Method Using a Percussion Drill and Clamshell; a) First Stage of Pilot Hole Digging with Percussion Drill; b) Second Stage of Excavation With Clamshell Bucket. (ICOLD 1985).....	32
Figure 15 Bentonite Cement Slab Barrier Wall, Figures a,b,d,f are Primary Panels. Figures c,e, and g are Secondary Panels (ICOLD 1985).....	40
Figure 16 a) Pile Drilling Machine, BAUER BG-14, b) Pile Drill Intersection Thickness	43
Figure 17 Photo of the Construction of the Pillar Barrier Wall at the Jatiluhur Dam, a) Drilling Implementation; b) Concreting via Tremie.....	44
Figure 18 Marmorera or Castiletto Dam, Switzerland. On the cross Section of the Lower Dam Body; Longitudinal section, on the left support, you can see several storey galleries to grout curtains and make concrete diaphragms (Photo of the Swiss Committee on Dams)	46
Figure 19 Lech Dam.....	47

The picture above: Cross section of the dam body. Bottom image, detailed image:

- 1) Vibrating Barrier Wall
- 2) Lacustrine Clay
- 3) Gravel
- 4) Gravel Heap
- 5) Asphalt Concrete Facing/Waterproof Layer 12 Cm
- 6) Asphalt Concrete Base Plate
- 7) Cap (Dense Plastic Asphalt

LIST OF CONTENTS

FOREWORD	i
WELCOME	ii
LIST OF CONTENTS	iii
CHAPTER I INTRODUCTION	
1.1. Background.....	1
1.2. Purpose and Objectives.....	1
1.3. Scope of Guidelines.....	1
1.4. Reference.....	2
1.5. Understanding.....	2
CHAPTER II THE FORMATION OF SOFT SOIL	
2.1. Definition.....	5
2.2. Origin of Land.....	7
2.3. Mineralogy.....	10
2.4. Weathering.....	11
2.5. Geotechnical Properties of Clay.....	12
CHAPTER III GEOTECHNICAL INVESTIGATION	
3.1. Background.....	14
3.2. Field Investigation.....	16
3.2.1. Drilling and Sampling Methods.....	16
3.2.2. Handling of Undisturbed Soil Samples.....	24
3.2.3. On-site testing (In-situ).....	25
3.2.3.1. Vane Shear Test.....	25
3.2.3.2. Piscoonus (Piezocone) Penetration Test.....	26
3.3. Testing in the Laboratory.....	26
3.3.1. General.....	26
3.3.2. Soil Classification.....	27
3.3.3. Organic Content.....	28
3.3.4. Triaxial Testing.....	29
3.3.5. Residual Direct Swipe.....	29
3.3.6. Primary Consolidation and Secondary Compression.....	29
3.4. Backfill Material.....	34
3.4.1. General.....	34
3.4.2. Clay Soil.....	34
3.4.3. Other Materials.....	35
CHAPTER IV DESIGN ANALYSIS	
4.1. Design Philosophy.....	36
4.2. Planning Stages.....	37
4.2.1. Initial Design.....	37
4.2.2. Detailed Design.....	37
4.3. Analysis and Calculation Methods.....	40
4.3.1. General.....	40
4.3.2. Support Power.....	41
4.3.3. Slope Stability Analysis.....	42
4.3.3.1. General.....	42
4.3.3.2. Circular Landslide Field Method.....	43
4.3.3.3. Bai Landslide Field Method.....	44
4.3.3.4. Non-Circular Landslide Field Method.....	45
4.3.3.5. Spencer Method.....	45
4.3.3.6. Janbu Method.....	46
4.3.3.7. Morgenstern and Price Method.....	46
4.3.4. Soil Reinforcement Stability.....	47
4.3.5. Horizontal Plastic Movement.....	47
4.3.6. Geosynthetic.....	51
4.3.6.1. General.....	51
4.3.6.2. Soil reinforcement.....	52
4.3.6.3. Foot Drainage Filter.....	53
4.3.7. Decline Analysis.....	55
4.3.8. Lift Pressure.....	57
4.3.9. Liquefaction Analysis.....	58
4.3.9.1. General.....	58
4.3.9.2. Seed & Idris Method (1971).....	60
4.4. Foundation Soil Balancing Methods.....	64
4.4.1. General.....	64
4.4.2. Soil Pressure and Replacement Methods.....	64
4.4.3. Ballast Berm.....	65
4.4.4. Accelerating Consolidation.....	66
4.4.4.1. Vertical Drainage and pre-loading.....	66
4.4.4.2. Vacuum.....	74
4.4.5. Deformation Limitation.....	74
4.5. Phased Hoarding Construction.....	76
CHAPTER V CONTROL OF CONSTRUCTION IMPLEMENTATION	
5.1. General.....	81
5.2. Monitoring.....	81
5.2.1. Construction Speed.....	81
5.2.2. Deformation Monitoring.....	82
5.2.3. Pore Water Pressure Monitoring.....	83
5.2.4. Monitoring Organization.....	83
5.3. Collapse Monitoring and Prediction.....	83
5.3.1. Pore Water Pressure.....	83
5.3.2. Deformation.....	84
5.3.2 Deformation. CHAPTER VI COMPLETE BUILDINGS	84
6.1. General.....	87
6.2. Spillway Building.....	87
6.2.1. Structural Design Considerations.....	87
6.2.2. Seepage and Lift pressure.....	90
6.2.3. Building Stability.....	92
6.3. Production Building.....	92
6.3.1. General.....	92
6.3.2. Steering Channel and Output Channel.....	93
6.3.3. Tapper Building.....	93

APPENDIX LIST

APPENDIX A GEOTECHNICAL CORRELATION

A.1 General	95
A.2 Soil Classification Based on Sondir	95
A.3 Shear Strength Correlation	96
A.4 Modulus of Elasticity	98
A.5 Compression Index	98
APPENDIX B	
B.1 Example of Settlement and Vertical Drain Calculations	101
B.2 Soil Stress Distribution Under Triangular Load	104
B.3 Soil Stress Distribution Under Embankment Load	105
B.4 Example of Load Analysis Required to Reduce Settlement	106
B.5 Example of the Influence of SMEAR on Sand Drain Design	107
B.6 Example of Translational Collapse Stability Analysis	108
B.7 Example of Stability Analysis in Cohesive Soil	109
B.8 Example of Critical Circle Center, Slope Slope in Cohesive Soil	110
B.9 Examples of the Effect of Additional Loads, Soaking, and Tensile Fractures on Stability	111
B.10 Examples of Ballast (Berm) Designs for Soft Soil Foundations	112
APPENDIX C	
C.1 Prediction of Pore Water Drop and Pressure in Gradual Filling	113
C.2 Interpretation Based on Decline Plate and Pizometer Readings	114

BIBLIOGRAPHY

Table 1	: Soft Soil Group	5
Table 2	: Cytate The consistency of clay matches the mineral content	11
Table 3	: The influence of post-depositional processes on clay silts	12
Table 4	: Soil classification based on organic content	13
Table 5	: Types of Geotechnical Investigation and Analysis Methods in Preliminary Design and Detailed Design	14
Table 6	: Type of investigation and parameters of soil obtained	15
Table 7	: Undisturbed soil sampling method for soft soil	17
Table 8	: The method of taking samples is disturbed for steady crops	18
Table 9	: Recommended drill bit speed/advance (USBR, Clark, 1963)	19
Table 10	: Classification of the level of disturbance in soft soil sampling	24
Table 11	: Soil Activity Levels	28
Table 12	: Category Erosion resistance of clay soil	35
Table 13	: Minimum Safety Factor Requirements for the Stability of Earthfill Type Dams	50
Table 14	: Recommendations for the slope of a dam on soft soil (Design of Small Dams, USBR, 1976)	51
Table 15	: Practical Actions Regarding the Thickness of Soft Soil	51
Table 16	: Geosynthesis Material Parameters and Properties	52
Table 17	: Geotextile Filter Criteria According to Rijkswaterstaat, Netherlands	54
Table 18	: Relationship between Relative Density and Liquefaction Potential	60
Table 19	: Construction Monitoring Coordination Relationship	83

LIST OF TABLES

Table 1	: Soft Soil Group	5
Table 2	: Cytate The consistency of clay matches the mineral content	11
Table 3	: The influence of post-depositional processes on clay silts	12
Table 4	: Soil classification based on organic content	13
Table 5	: Types of Geotechnical Investigation and Analysis Methods in Preliminary Design and Detailed Design	14
Table 6	: Type of investigation and parameters of soil obtained	15
Table 7	: Undisturbed soil sampling method for soft soil	17
Table 8	: The method of taking samples is disturbed for steady crops	18
Table 9	: Recommended drill bit speed/advance (USBR, Clark, 1963)	19
Table 10	: Classification of the level of disturbance in soft soil sampling	24
Table 11	: Soil Activity Levels	28
Table 12	: Category Erosion resistance of clay soil	35
Table 13	: Minimum Safety Factor Requirements for the Stability of Earthfill Type Dams	50
Table 14	: Recommendations for the slope of a dam on soft soil (Design of Small Dams, USBR, 1976)	51
Table 15	: Practical Actions Regarding the Thickness of Soft Soil	51
Table 16	: Geosynthesis Material Parameters and Properties	52
Table 17	: Geotextile Filter Criteria According to Rijkswaterstaat, Netherlands	54
Table 18	: Relationship between Relative Density and Liquefaction Potential	60
Table 19	: Construction Monitoring Coordination Relationship	83

Table C.1	: Primary and secondary settlement as a function of equal pressure under various embankment loads	113
Table C.2	: Reduction and Pore Water Pressure Due to Embankment	115

LIST OF FIGURES

Figure 1	Distribution of soft soil in Indonesia	6
Figure 2	Clay minerals: (a) Kaolinite, (b) Illite, (c) Montmorillonite	10
Figure 3	Clay structure: (a) dispersed, (b) flocculated, (c) bookhouse, (d) turbostratic, (e) example of natural soil structure	10
Figure 4	Soil transport and deposition	11
Figure 5	Effect of Pore Water Pressure on Effective Stress (Skempton, 1970)	13
Figure 6	Rotary drilling machine configuration	19
Figure 7	Fishtail type drill bit	19
Figure 8	Position of piston tube during sampling penetration	20
Figure 9	Type of Hvorslev fixed piston tube 3" diameter	21
Figure 10	Piston-type split-cone sampler	21
Figure 11	Osterberg hydraulic piston type (Osterberg, 1973)	21
Figure 12	Type of NGI modification, 54 mm (Anderson & Kolstad, 1979)	22
Figure 13	Japanese piston types (JSSMFE, 1977)	22
Figure 14	Diameter of soil sampling tube	23
Figure 15	Thin wall tube (Hvorslev, 1949) (open-drive thin wall)	23
Figure 16	Thin wall tube with free piston, JSSMFE, Japan (1972)	23
Figure 17	Sample tube covered with paraffin	24
Figure 18	Top View Example of how to pack sample tubes	24
Figure 19	Tools and procedures for shearing blades in the field	25
Figure 20	Test equipment and procedures using the Piskonus tool	26
Figure 21	Soil classification based on the Unified Soil Classification	27
Figure 22	Direct sliding tool back and forth	29
Figure 23	The spring and piston analogy illustrates the consolidation process (Taylor, 1948)	30
Figure 24	Stages of primary consolidation and secondary compression processes	31
Figure 25	Typical results of primary consolidation testing (e/log P curve)	31
Figure 26	Example of calculation using a square-root time graph	32
Figure 27	Relationship of T _v and level of consolidation U _v	33
Figure 28	Determination of the secondary compression coefficient	33
Figure 29	Characteristics of Resistance to Erosion Based on Plastic Properties of Soil	34
Figure 30	Flowchart of Investigation Stages to Kindi Design	38
Figure 31	Flowchart of Dam Design on Soft Soil	39
Figure 32	Failure pattern of bearing capacity	41
Figure 33	Bearing Capacity Factor N _c according to G. Pilot	42
Figure 34	Collapse Pattern of Embankment on Soft Surface	43
Figure 35	Circular landslide plane with cross-sections	43
Figure 36	Forces acting on a horizontal landslide plane	44
Figure 37	Forces acting on the slice	45
Figure 38	Principles of the Janbu Method	46
Figure 39	Analysis of foundation stability against shear	47
Figure 40	Balance of forces due to squeezing out	48
Figure 41	Principles of Circular Landslide Analysis using Geosynthetics	49
Figure 42	Example of a woven type of geosynthetic	52

Figure 43 Hydraulic loading on geotextiles	54	Appendix B.9 : Examples of the Effect of Additional Beam, Soaking, Tensile Fracturing on Stability	111
Figure 44 Mechanism of blockage	55	Appendix B.10.: Example of Ballast (Berm) Design for Soft Soil Foundations.....	112
Figure 45 Long-term blockage process (clogging).....	55	Appendix C.1 : Primary decline and decline after 27 years at various loads.....	114
Figure 46 Excess pore water pressure dissipation time; (a) one flow direction, (b) two flow directions.....	56	Appendix C.2: Safety Factor as a function of pore water pressure	116
Figure 47 Force balance due to lifting pressure	58	Appendix C.3: Increase and dissipation of pore water pressure.....	117
Figure 48 Scheme of liquefaction in sandy soil	58	Appendix C.4 : Decrease vs time	118
Figure 49 Gradation of sandy soil with potential for liquefaction.....	59		
Figure 50 Graph of cyclic pressure ratio against NSPT	61		
Figure 51 Ratio of cyclic pressure to $qc1$ sondir.....	62		
Figure 52 Example of liquidity analysis from NSPT results.....	63		
Figure 53 Example of liquefaction analysis from sondir results.....	63		
Figure 54 How to press land.....	65		
Figure 55 How to Replace Soil	65		
Figure 56 How to Add Ballast Berms	66		
Figure 57 Placement of vertical drainage and cut-offs on soft dam foundations.....	67		
Figure 58 Example of installing vertical drainage and instrumentation at the Manggar Dam	67		
Figure 59 Relationship between distance and vertical drainage pattern	68		
Figure 60 Nomogram to Determine the Level of Consolidation without Sand Drain	70		
Figure 61 Nomogram to determine the level of consolidation with sand drain.....	71		
Figure 62 Example of design chart for Colbondrain	72		
Figure 63 Example of design chart for Sundrain.....	72		
Figure 64 Soil Improvement Method Using a Lime / Cement Mixture	74		
Figure 65 Relationship between spacing pattern and column diameter; based on the unit cell concept.....	75		
Figure 66 Lime column analysis diagram	75		
Figure 67 Example of Safety Factors Against Pore Water Pressure.....	78		
Figure 68 Example of piezometer readings and lowering of the Manggar Dam during gradual filling	79		
Figure 69 Flowchart of the procedure for calculating stockpiling in stages	80		
Figure 70 Marche & Chapuis deformation observation method	84		
Figure 71 Graph of decline (s) with horizontal movement	85		
Figure 72 Graph of decline (s) with horizontal movement ratio	85		
Figure 73 Estimated limit bearing capacity	86		
Appendix A.1: Soil Classification Based on Automatic Sondir.....	95		
Appendix A.2: Soil Classification Based on Electrical Sondir	96		
Appendix A.3.: Soil Classification - Friction Ratio, Electrical Sondir	96		
Appendix A.4 : Correlation of Shear Strength and Consistency	97		
Appendix A.5 : Correlation between modulus of elasticity, bulk density and cone resistance (Dutch Standard, NEN6740)	99		
Appendix A.6 : Graph of Soil Types Based on Sondir Resistance	99		
Appendix A.7 : Shear Strength Graph of Soft Soil (Bjerrum, 1972)	100		
Appendix B.2. : Influence of values for vertical pressure in triangular loads.....	104		
Appendix B.3. : Distribution of Soil Stress Under Embankment Load (Osterberg, 1976).....	105		
Appendix B.4. : Example of Load Analysis Required to Reduce Settlement	106		
Appendix B.5. : Example of the Effect of Smear on Sand Drain Design Example of Load Analysis Required to Reduce Settlement	107		
Appendix B.6. : Example of Collapse Stability Analysis, Translation	108		
Appendix B.7. : Example of Stability Analysis in Cohesive Soil	109		
Appendix B.8. : Example of Critical Circle Center, Slope Slope in Cohesive Soil.....	110		

LIST OF CONTENTS

**DEPARTMENT OF REGIONAL HOUSING AND INFRASTRUCTURE
DIRECTORATE GENERAL OF RESOURCES
WATER POWER**

DECISION OF THE DIRECTOR GENERAL OF WATER RESOURCES
WELCOME i
FOREWORD iii
WELCOME v
LIST OF CONTENTS vii

CHAPTER I INTRODUCTION 1
1.1. Background 1
1.2. Purpose and Objectives 1
1.3. Scope 1
1.4. Normative Reference 2
1.5. Understanding 2

CHAPTER II THE FORMATION OF SOFT SOIL 9
2.1. General 9
2.2. Direct Damage 9
2.2.1. Primary damage 10
2.2.2. Secondary damage 12
2.3. Indirect Damage 12
2.4. The Effect of Earthquakes on Dam Damage 12
2.4.1. Potential and impact of damage to the dam 12
2.4.2. History of damage to embankment-type dams 12

CHAPTER III BASIC KNOWLEDGE OF EARTHQUAKE ENGINEERING 17
3.1. Introduction 17
3.2. Basic concepts 17
3.2.1. General 17
3.2.2. Plate tectonics 17
3.2.3. Fault movement 19
3.3. Fault Type (faults) 22
3.3.1. Strike-slip fault 22
3.3.2. Dip slip fault 24
3.3.3. Oblique slip fault 24
3.4. Earthquake Magnitude 25
3.5. Hypocenter and Epicenter 27
3.6. Energy Release Zone 28
3.7. Location Distance to earthquake source 28
3.8. Earthquake Shaking on the Ground Surface 29
3.9. Spectrum Response 30
3.10. Attenuation Function 32

CHAPTER IV EARTHQUAKE HAZARD ANALYSIS 33
4.1. General 33
4.2. Earthquake Source Characterization 33
4.2.1. View 33
4.2.2. Earthquake Source Characterization Methods 34
4.2.3. Determination of potential fault movements 35
4.3. Determination of Design Intensity of Surface Earthquake Shocks 36

DYNAMIC ANALYSIS OF EMBANKMENT DAM

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**DEPARTMENT OF GENERAL WORKS
DIRECTORATE GENERAL OF WATER RESOURCES**

4.3.1. Introduction.....	36
4.3.2. Deterministic approach.....	36
4.3.3. Probabilistic approach.....	39
4.3.4. Approach with a map of Indonesia's earthquake zones.....	41
4.3.4.1. Subduction earthquake data collection.....	41
4.3.4.2. The earthquake source area originates from the re-movement of active faults.....	47
4.3.4.3. Earthquake zone map.....	48
4.3.4.4. Steps for using the Indonesian Earthquake Zone Map.....	51
CHAPTER V CHARACTERIZATION OF SURFACE EARTHQUAKE SHAKES.....	54
5.1. Basic Characterization of Surface Earthquake Shocks.....	54
5.2. Peak Values.....	54
5.2.1. Evaluation of Peak Parameters.....	54
5.2.2. Peak values attenuation function.....	55
5.2.3. Selection of attenuation function.....	58
5.2.4. Selection of input (input) parameters of the attenuation function.....	59
5.2.5. Distribution of output (output) parameter values for surface earthquake shaking.....	59
5.3. Frequency Level.....	59
5.4. Energy Amount.....	59
5.5. Duration.....	61
5.6. Influence: Local Field Conditions.....	66
5.7. Selection of Representative Time History.....	69

CHAPTER VI CHARACTERIZATION OF SOIL LAYERS IN THE FIELD.....71

6.1. General Explanation.....	71
6.2. Subsurface Profile Development.....	72
6.2.1. General.....	72
6.2.2. Water face.....	72
6.2.3. Soil stratigraphy.....	73
6.2.4. Depth of bedrock.....	73
6.3. Required Soil Parameters.....	74
6.3.1. General.....	74
6.3.2. Relative density.....	74
6.3.3. Shear wave speed.....	75
6.3.4. Cyclic stress-strain properties.....	75
6.3.5. Peak and residual shear strength.....	77
6.4. Evaluation of Soil Properties.....	78
6.4.1. General.....	78
6.4.2. Field testing for soil profile.....	78
6.4.2.1. Standard penetration test (SPT).....	78
6.4.2.2. Konus penetration test (CPT).....	79
6.4.3. Soil density.....	81
6.4.4. Shear wave speed.....	81
6.4.4.1. General.....	81
6.4.4.2. Geophysical survey.....	81
6.4.4.3. Pressure wave speed.....	84
6.4.5. Evaluation of cyclic stress-strain parameters.....	84
6.4.5.1. Laboratory test.....	84
6.4.5.2. Use of Empirical Correlation.....	85
6.4.5.3. Peak and residual shear strength.....	89

CHAPTER VII ANALYSIS OF DYNAMIC RESPONSES TO EARTHQUAKE EFFECTS.....91

7.1. General.....	91
7.2. Dynamic Response Analysis of Special Local Conditions (site-specific site response analysis).....	91
7.3. Response Simplification Analysis: Dynamic.....	93
7.4. Equivalent Linear One-Dimensional Dynamic Response Analysis.....	100
7.5. One and Two-Dimensional Dynamic Response Analysis.....	103
7.5.1. General.....	103
7.5.2. Nonlinear one-dimensional dynamic response analysis.....	103
7.5.3. Two-dimensional dynamic response analysis.....	104

CHAPTER VIII STABILITY OF EARTHQUAKE EFFECT OF SLOPE.....106

8.1. Background.....	106
8.2. Earthquake Coefficient Analysis.....	107
8.2.1. General.....	107
8.2.2. Selection of earthquake coefficients.....	109
8.2.2.1. The method based on experience.....	109
8.2.2.2. Probabilistic method.....	110
8.3. Analysis of Permanent Diversion Due to Earthquakes from Newmark.....	115
8.4. Unification Methodology (Unified Methodology) for Analysis of Stability and Transfer (Deformation) Due to Earthquakes.....	117
8.5. Additional Considerations.....	119

CHAPTER IX LIQUEFACTION AND SOIL SUBSTANCE DUE TO EARTHQUAKES120

9.1. Introduction.....	120
9.2. Factors Influencing Liquefaction Events.....	120
9.3. Evaluation of Liquefaction Potential.....	123
9.4. Post Liquefaction Stability and Deformation.....	131
9.5. Evaluation of Settlement Due to Earthquake.....	133
9.6. Liquefaction Mitigation.....	136

CHAPTER.....137

10.1. General.....	137
10.2. Foundation System Response Due to Earthquake.....	137
10.3. Performance of Retaining Walls Due to Earthquakes.....	139
10.4. Shallow Foundation Design.....	139
10.4.1. General.....	139
10.4.2. Pseudo-static analysis.....	140
10.4.2.1. General.....	140
10.4.2.2. Evaluate loads for pseudo-static bearing capacity analysis.....	140
10.4.2.3. General equation of bearing capacity.....	141
10.4.2.4. Carrying capacity of the penetration test.....	144
10.4.2.5. Landslide resistance of shallow foundations.....	145
10.4.2.6. Safety factor.....	145
10.4.3. Dynamic response analysis.....	146
10.4.3.1. General.....	146
10.4.3.2. Stiffness Matrix of foundations with circular cross-section.....	146
10.4.3.3. Attenuation.....	147
10.4.3.4. Foundations with a Rectangular Section.....	148
10.4.3.5. Effect of embankment.....	150
10.4.3.6. Implementation of Dynamic Response Analysis.....	150

10.5.	Deep Foundation Design.....	151
10.5.1.	General.....	151
10.5.2.	Analysis method.....	152
10.5.2.1.	General.....	152
10.5.2.2.	Piling forceps head stiffness matrix.....	153
10.5.2.3.	Influence of pliers group.....	154
10.5.2.4.	Pile lifting force capacity.....	155
10.4.2.5.	Liquefaction.....	156
10.6.	Retaining wall.....	156
10.6.1.	General.....	156
10.6.2.	Evaluation of earthquake-resistant dining.....	157
10.6.2.1.	Pseudo-static Theory.....	157
10.6.2.2.	Deformation approach.....	160
10.6.2.3.	Stiffness approach.....	161
10.6.2.4.	Mechanical stability of retaining walls.....	161
	Appendix A Earthquake Parameters.....	163
	Appendix B Fixed transfer analysis formula.....	170
	Appendix C Examples of calculations.....	175
	Bibliography.....	181

LIST OF TABLES

Table 4.1	: Earthquake event data per box 1° longitude and latitude for box 1.....	42
Table 4.2	: Analysis of earthquake data per box of 1° longitude and latitude.....	43
Table 4.3a	: Point a ₁ , b and correlation coefficient R ₂ in boxes 1 to 307.....	45
Table 4.3b	: Mark a ₁ , b and correlation coefficient R ₂ in boxes 327 to 619.....	46
Table 4.3c	: Mark a ₁ , b, and correlation coefficient R ₂ on boxes 846 to 1093.....	46
Table 4.3d	: Point a ₁ , b and Correlation coefficient R ₂ in boxes 1094 to 1119.....	47
Table 4.4	: Active fault parameters used for earthquake risk analysis.....	44
Table 4.5	: List of the number of earthquake events at certain intervals for parts of Indonesia (Sumatra) from statistical calculations.....	49
Table 4.6	: Earthquake risk for various useful lives and return periods.....	51
Table 4.7	: Correction factor for the influence of local soil types.....	52
Table 5.1	: Usable attenuation function.....	56
Table 5.2	: Attenuation function for subduction earthquake zones.....	57
Table 5.3	: Location classification according to NEHRP (Borcherdt, 1994).....	53
Table 6.1	: Relative density of sandy soil (Terzaghi and Peck, 1948).....	74
Table 6.2	: Typical values of initial shear modulus.....	85
Table 6.3	: Correlation for initial shear modulus estimates.....	86
Table 8.1	: The level of damage is based on the magnitude of the maximum earthquake acceleration at the MDE.....	112
Table 8.2	: Risk factor criteria for dam safety evaluation.....	113
Table 8.3	: Risk classes for dams and water structures.....	113
Table 8.4	: Earthquake load criteria for dam design.....	114
Table 8.5	: Minimum safety factor requirements for the stability of embankment type dams.....	115

Table 9.1	: AbilitySediment deposits experience liquefaction during strong earthquake shaking (Youd and Perkins, 1978).....	121
Table 9.2	: Recommended standard SPT equipment (Seed et al, 1985 and Riggs, 1986).....	126
Table 9.3	: Correction factors for non-standard SPT procedures and equipment (Richardson et al, 1995).....	126
Table 9.4	: Effect of earthquake magnitude: on the volumetric strain ratio for dry sand (Tokimatsu and Seed,1987).....	136
Table 10.1	: Inclination factor for shallow foundation bearing capacity (according to Meyerhof, 1956).....	144
Table 10.2	: Equivalent damping ratio for rigid foundations (Richart et al, 1970).....	148
Table 10.3	: Summary of test results of centrifugal models in sand: 3x3 group, with free and fixed tong heads (Pinto et al, 1997).....	154
Table A.1	: Location class depending on rock hardness.....	164
Table A.2	: Constant B for equation A.10.....	165
Table A.3	: Parameters: 22 earthquake accelerometer recordings for dynamic response analysis.....	169
Table B.1	: B grade _a for 5 types of vibrations in embankment dams.....	172
Table C.1	: Soil parameters of Tilong Dam (figure C.4 Profileacross Tilong Dam).....	176
Table C.2	: Tilong Dam risk class.....	177
Table C.3	: Design earthquake acceleration for stability analysis of the Tilong Dam.....	177
Table C.4	: Results of stability analysis of the influence of the earthquake on the steady seepage condition of the Tilong Dam.....	179

LIST OF FIGURES

Figure 1.1	Types of embankment dams.....	11
Figure 2.1	Chart of damage due to earthquakes.....	11
Figure 2.2	Building tilting due to soil liquefaction during the 1964 Niigata (Japan) earthquake.....	11
Figure 2.3	Lowering of the San Fernando peak during the 1971 San Fernando earthquake.....	11
Figure 2.4	Secondary earthquake damage resulting in fire.....	11
Figure 2.5	Wide cracks along the village slope and along the crest of the dam caused by the 2001 Bhuj Earthquake (photo Prof. SK Jain).....	11
Figure 2.6	Damage to the top of an embankment-type dam due to the 2001 Bhuj Earthquake (Photo Prof. SK Jain).....	11
Figure 2.7	Wide cracks in the dam caused by the Bhuj Earthquake (Photo 13 Prof. SK Jain).....	11
Figure 2.8	Landslide on an embankment-type dam due to the 2001 Bhuj Earthquake (Photo Prof. SK Jain).....	11
Figure 2.9	Longitudinal cracks at the top of the dam, due to the 2001 Bhuj 14 earthquake (photo Prof. SK Jain).....	11
Figure 3.1	The main tectonic plates and their approximate directions of movement (modification from Park, 1983 Foundations of Structural Geology, Chapman and Hal).....	11
Figure 3.2	Arrangement and cross-section through the Sumatra and Java Island tectonic plates (Engkon Kertapati, 2006).....	11
Figure 3.3	Seismicity in Indonesia 1973-2003 (Suhardjono, 2006).....	11

Figure 3.4 Map of active faults in Indonesia (Directorate of Volcanology and Geological Disasters (2006)).....	28
Figure 3.5 Types of fault displacement.....	29
Figure 3.6 Fault geometry for moment magnitude calculations.....	30
Figure 3.7 Comparison of earthquake magnitude scales (Heaton et al., 1986).....	28
Figure 3.8 Definition of fault geometry.....	29
Figure 3.9 Various distances used in seismic engineering.....	30
Figure 3.10 History of acceleration, velocity, and deformation with time.....	30
Figure 3.11 Development of acceleration spectrum response (Matasovic, 1993).....	30
Figure 3.12 Tripartite graph of the response spectrum of acceleration, velocity, and deformation.....	34
Figure 4.1 Characterization of the earthquake source area.....	34
Figure 4.2 Flow chart for determining peak intensity at the soil/rock surface.....	38
Figure 4.3 Analysis steps using a deterministic approach.....	39
Figure 4.4 Analysis steps with a probabilistic approach.....	39
Figure 4.5 Relationship between cumulative frequency and cumulative magnitude from earthquake instruments; data on the South-Central segment of the San Andreas fault (Schwartz and Coppersmith, 1984).....	40
Figure 4.6 Earthquake source areas in Indonesia are in the form of boxes.....	44
Figure 4.7 Relationship between magnitude and log N_r (Ms) for box 1.....	45
Figure 4.8 Location of peak horizontal acceleration (PHA) calculation coordinates for various regions in Indonesia.....	50
Figure 4.9 Map of Indonesian earthquake zones using the Fukushima & Tanaka (1990) attenuation equation.....	53
Figure 5.1 Comparison of attenuation functions from several researchers.....	56
Figure 5.2 Comparison of dedicated PHGA attenuation functions (in the United States).....	57
Figure 5.3 Comparison of the lasting acceleration spectrum response for various earthquake magnitudes (Campbell's attenuation function, 1993).....	60
Figure 5.4 Comparison of lasting acceleration spectrum responses.....	61
Figure 5.5 Attenuation of root mean square acceleration (Kavazanjian et al., 1985a, reprinted with permission of ASCE).....	62
Figure 5.6 Accelerogram data during the Loma Prieta earthquake, 1989.....	63
Figure 5.7 Duration of strong shaking from Bolt (1973).....	64
Figure 5.8 Duration of strong shaking from Trifunac and Brady (1975).....	64
Figure 5.9 Duration vs magnitude of earthquakes in the western United States (Dobry et al., 1978).....	65
Figure 5.10 Soil conditions and characteristics of ground shaking data, San Francisco earthquake $M = 5.3$ in Daly City in 1957 (Seed, 1975).....	66
Figure 5.11 Comparison of acceleration spectral responses of soil and rock areas for an $M = 8$ earthquake at a distance of 5 km (Campbell and Borognia, 1994, reprinted with permission of EERI).....	67
Figure 5.12 Normalized uniform acceleration spectrum response building regulations (UBC, 1994).....	68
Figure 6.1 Geotechnical investigation flowchart for response analysis.....	71
Figure 6.2 Stresses affecting soil elements by vertical propagation of shear waves.....	76
Figure 6.3 Response of hysteretic stress-strain soil under cyclic loading.....	77
Figure 6.4 Shear modulus reduction curve and viscous damping ratio.....	77
Figure 6.5 Correlation of N_{spT} and relative density (Marcuson and Bieganousky, 1977).....	79
Figure 6.6 Soil classification system based on CPT (Douglas and Olsen, 1981, reprinted with permission from ASCE).....	80
Figure 6.7 Correlation graph of CPT - soil behavior - SPT (Martin, 1992, reprinted with permission of ASCE).....	80
Figure 6.8 SASW test scheme (Kavazanjian et al., 1994).....	83
Figure 6.9 Sand shear modulus reduction curve (Seed and Idriss, 1970).....	87
Figure 6.10 Sand shear modulus reduction curve (Iwasaki et al., 1978, Japanese Society of Soil Mechanics and Foundation Engineering).....	87
Figure 6.11 Shear modulus reduction curve and damping ratio as a function of shear strain and soil plasticity index (Vucetic and Dobry, 1991).....	88
Figure 6.12 Graph of the relationship between the number of corrected clean sand blows (N1)60-cs and undrained residual strength (S _v) from the case study (Seed and Harder, 1990).....	90
Figure 7.1 Flow chart of stability analysis and dynamic response of an embankment type dam.....	92
Figure 7.2 Relationship between peak horizontal acceleration in rock and peak acceleration on the ground surface for various soil layer conditions (Seed and Idriss, 1982).....	93
Figure 7.3 Relationship between PHGA in rock and soft soil conditions (Idriss, 1990).....	94
Figure 7.4 Comparison of the peak acceleration of the base soil and the peak of the recorded earthfill dam (Harder, 1991).....	95
Figure 7.5 Flow chart of dynamic response analysis, simplification of the Makdisi-Seed method for determining constant transfer.....	96
Figure 7.6: Variation of average peak acceleration ratio with landslide mass depth (Makdisi and Seed, 1978).....	97
Figure 7.8: Normalized earthquake acceleration spectrum for diluvium foundations (0.25 < T_s ≤ 0.50 seconds).....	98
Figure 7.9: Normalized earthquake acceleration spectrum for 99 alluvium foundations (0.50 < T_s ≤ 0.75 seconds).....	98
Figure 7.10 Variation of normalized earthquake acceleration for soft alluvium 99 foundations ($T_s > 0.75$ seconds).....	99
Figure 7.11 FK correction C_n to determine the variation of normalized earthquake acceleration with D not equal to 5%.....	100
Figure 7.12 Flow chart of equivalent linear one-dimensional dynamic response analysis.....	102
Figure 7.13 Flow chart of equivalent linear two-dimensional dynamic response analysis.....	105
Figure 8.1 Composite shear strength envelope.....	107
Figure 8.2 Analysis of pseudo-static limit balance due to earthquake.....	108
Figure 8.3 Permanent transfer graph of earthquake effects (Hynes and Franklin, 1984).....	110
Figure 8.4 Typical dam profile.....	111
Figure 8.5 Basic elements of Newmark deformation analysis (Matasovic et al., 1997).....	116
Figure 8.6 Fixed displacement versus ratio of critical earthquake acceleration and maximum average acceleration in embankment dams (Makdisi and Seed, 1978).....	118
Figure 9.1 Soil grain size distribution curve with potential for liquefaction (modification of Ishihara et al., 1989).....	122
Figure 9.2 Variation of the q_c/N_{60} ratio with the average grain size D_{50} (Seed and De Alba, 1986).....	123
Figure 9.3 Voltage reduction factor r (modification of Seed and Idriss, 1982).....	125
Figure 9.4 Effective overburden pressure correction factor, C_N (Seed et al., 1983).....	127
Figure 9.5 Relationship between the stress ratio that causes liquefaction and the value of (N1)60 for sand with an earthquake of $M_w = 7.5$. (Seed et al., 1985).....	128
Figure 9.6 Estimated magnitude correction factor curve, M_k (Seed et al., 1983).....	129
Figure 9.7 Estimated co correction factor curve (Harder, 1988 and Hynes, 1988, quoted from Marcuson et al., 1990).....	129
Figure 3.4 Map of active faults in Indonesia (Directorate of Volcanology and Geological Disasters (2006)).....	28
Figure 3.5 Types of fault displacement.....	29
Figure 3.6 Fault geometry for moment magnitude calculations.....	30
Figure 3.7 Comparison of earthquake magnitude scales (Heaton et al., 1986).....	28
Figure 3.8 Definition of fault geometry.....	29
Figure 3.9 Various distances used in seismic engineering.....	30
Figure 3.10 History of acceleration, velocity, and deformation with time.....	30
Figure 3.11 Development of acceleration spectrum response (Matasovic, 1993).....	30
Figure 3.12 Tripartite graph of the response spectrum of acceleration, velocity, and deformation.....	34
Figure 4.1 Characterization of the earthquake source area.....	34
Figure 4.2 Flow chart for determining peak intensity at the soil/rock surface.....	38
Figure 4.3 Analysis steps using a deterministic approach.....	39
Figure 4.4 Analysis steps with a probabilistic approach.....	39
Figure 4.5 Relationship between cumulative frequency and cumulative magnitude from earthquake instruments; data on the South-Central segment of the San Andreas fault (Schwartz and Coppersmith, 1984).....	40
Figure 4.6 Earthquake source areas in Indonesia are in the form of boxes.....	44
Figure 4.7 Relationship between magnitude and log N_r (Ms) for box 1.....	45
Figure 4.8 Location of peak horizontal acceleration (PHA) calculation coordinates for various regions in Indonesia.....	50
Figure 4.9 Map of Indonesian earthquake zones using the Fukushima & Tanaka (1990) attenuation equation.....	53
Figure 5.1 Comparison of attenuation functions from several researchers.....	56
Figure 5.2 Comparison of dedicated PHGA attenuation functions (in the United States).....	57
Figure 5.3 Comparison of the lasting acceleration spectrum response for various earthquake magnitudes (Campbell's attenuation function, 1993).....	60
Figure 5.4 Comparison of lasting acceleration spectrum responses.....	61
Figure 5.5 Attenuation of root mean square acceleration (Kavazanjian et al., 1985a, reprinted with permission of ASCE).....	62
Figure 5.6 Accelerogram data during the Loma Prieta earthquake, 1989.....	63
Figure 5.7 Duration of strong shaking from Bolt (1973).....	64
Figure 5.8 Duration of strong shaking from Trifunac and Brady (1975).....	64
Figure 5.9 Duration vs magnitude of earthquakes in the western United States (Dobry et al., 1978).....	65
Figure 5.10 Soil conditions and characteristics of ground shaking data, San Francisco earthquake $M = 5.3$ in Daly City in 1957 (Seed, 1975).....	66
Figure 5.11 Comparison of acceleration spectral responses of soil and rock areas for an $M = 8$ earthquake at a distance of 5 km (Campbell and Borognia, 1994, reprinted with permission of EERI).....	67
Figure 5.12 Normalized uniform acceleration spectrum response building regulations (UBC, 1994).....	68
Figure 6.1 Geotechnical investigation flowchart for response analysis.....	71
Figure 6.2 Stresses affecting soil elements by vertical propagation of shear waves.....	76
Figure 6.3 Response of hysteretic stress-strain soil under cyclic loading.....	77
Figure 6.4 Shear modulus reduction curve and viscous damping ratio.....	77
Figure 6.5 Correlation of N_{spT} and relative density (Marcuson and Bieganousky, 1977).....	79
Figure 6.6 Soil classification system based on CPT (Douglas and Olsen, 1981, reprinted with permission from ASCE).....	80

Figure 9.8 Flow chart of liquefaction analysis.....	130
Figure 9.9 Estimated curve of the correction factor ka (Harder, 1988 and Hynes, 1988, quoted from Marcuson et al., 1990, reprinted with permission from EERI).....	131
Figure 9.10 Post-liquefaction volumetric strain estimation curves using SPT data and cyclic stress ratio for a Mw = 7.5 earthquake (Tokimatsu and Seed 1987)	132
Figure 9.11 Graph of determining shear strain due to earthquakes in sand deposits (Tokimatsu and Seed, 1987).....	135
Figure 9.12 Relationship between volumetric strain, cyclic shear strain, and penetration resistance for unsaturated sand (Tokimatsu and Seed, 1987).....	135
Figure 10.1 Principle of superposition of loads on the foundation.....	138
Figure 10.2 Foundation degrees of freedom and associated stiffness matrix.....	139
Figure 10.3 Evaluation of turning moment.....	142
Figure 10.4 Calculation of the equivalent radius of a four-square foundation.....	149
Figure 10.5 Form factor for a rectangular foundation (Lam and Martin, 1986).....	149
Figure 10.6 Backfill factors for foundations with $D/R < 0.5$ (Lam and Martin, 1986).....	150
Figure 10.7 Backfill factors for foundations with $D/R > 0.5$ (Lam and Martin, 1986).....	150
Figure 10.8 Three-dimensional pile and soil interaction (Bryant and Matlock, 1977).....	152
Figure 10.9 Forces behind a gravity wall according to Mononobe-Okabe theory.....	158
Figure 10.10 Influence of earthquake coefficient and friction angle on active pressure coefficient due to earthquake (Lam and Martin, 1986).....	159
Figure 10.11 Forces behind a gravity wall according to Richards and Elms theory.....	160
Figure A.1 Relationship between horizontal earthquake acceleration and hypocenter distance.....	165
Figure A.2 Relationship between epicenter distance and hypocenter distance with earthquake depth.....	166
Figure A.3 Relationship between the dominant period in the bedrock and the distance to the active fault or distance to the epicenter for magnitude variations (Seed et al, 1969).....	168
Figure B.1 Relationship between K_{max}/a_{max} and y/H	170
Figure B.2 Relationship between K_y/K_{max} and U_k	170
Figure B.3 Seed & Martin model in U_{max} formulation.....	171
Figure B.4 Value of ϕ_n , function of y/H	172
Figure C.1 Map of Tilong Dam location.....	175
Figure C.2 Layout, spillway building and outlet building of Tilong Dam.....	175
Figure C.3 Longitudinal and transverse sections of Tilong Dam.....	176
Figure C.4 Profile and soil parameters of Tilong Dam	176
Figure C.5 Results of static stability analysis of the upstream slope of the Tilong Dam seepage conditions.....	178
Figure C.6 Results of static stability analysis of downstream slopes under steady seepage conditions at Tilong Dam.....	178
Figure C.7 Graph of the relationship between the earthquake coefficient K and the safety factor (FK) of Tilong Dam.....	180

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WATER POWER

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DIRECTORATE GENERAL OF WATER RESOURCES

LIST OF CONTENTS

DECISION OF THE DIRECTOR GENERAL OF WATER RESOURCES

WELCOME	i
FOREWORD	iii
WELCOME	v
LIST OF CONTENTS	vii

CHAPTER I INTRODUCTION

1.1. Background	1
1.2. Purpose and Objectives	1
1.3. Scope	1
1.4. Normative Reference	2
1.5. Terms and Definitions	3

CHAPTER II GENERAL DESIGN CONSIDERATIONS

2.1. Types of Gravity Concrete Dams	9
2.1.1. Conventional concrete dam	11
2.1.2. gravity roller compacted concrete dam (roller compacted)	13
2.2. Coordination Between Disciplines	14
2.3. Construction Materials	15
2.4. Location Selection	17
2.4.1. General	17
2.4.2. Selection factors	17
2.5. Determination of Foundation Strength Parameters	18
2.5.1. General	18
2.5.2. Field investigation	19
2.5.3. Compressive strength and shear strength testing	19
2.5.4. Strong shear design	19

CHAPTER III DESIGN DATA

3.1. Concrete Properties	17
3.1.1. General	20
3.1.2. Strength	20
3.1.3. Elastic parameters	20
3.1.4. Heat parameters	21
3.1.5. Dynamic parameters	21
3.1.6. Average values of concrete parameters	21
3.2. Foundation Characteristics	22
3.2.1. Geotechnical investigations for concrete gravity dams	22
3.2.2. Deformation modulus	23
3.2.3. Static strength parameters	23
3.2.4. Dynamic strength parameters	25
Loading	25
3.3. 3.3.1. General	25
3.3.2. Dead load	25
3.3.3. Village and downstream water levels	25
3.4. Lifting Pressure (Uplift)	26
3.5. Temperature	34
3.6. Soil and Sediment	34

3.7. Seismicity	34
3.8. Lower Atmospheric Pressure	37
3.9. Wave Pressure	37
3.10. Foundation Reaction	37

CHAPTER IV ANALYSIS OF EARTHQUAKE HAZARDS AND CHARACTERIZATION OF EARTHQUAKE SHAKES

4.1. General	37
4.2. Earthquake Source Characterization	37
4.2.1. View	37
4.2.2. Earthquake Source Characterization Methods	38
4.2.3. Determination of potential fault movements	39
4.3. Determination of Design Intensity of Surface Earthquake Shocks	40
4.3.1. Introduction	40
4.3.2. Deterministic approach	41
4.3.3. Probabilistic approach	42
4.3.4. Approach with a map of Indonesia's earthquake zones	45
4.4. Characterization of Surface Earthquake Shocks	47
4.4.1. Design earthquake acceleration spectrum	48
4.4.2. Accelerogram of a strong earthquake in bedrock	54
4.5. Gravity Concrete Dam Design Criteria	56
4.5.1. Risk class classification	56
4.5.2. Determination of earthquake loads	57
4.5.3. Earthquake coefficient method	58

CHAPTER V STABILITY ANALYSIS

5.1. Introduction	59
5.2. Basic Loading Conditions	59
5.2.1. General	60
5.2.2. Special conditions	61
5.3. Cross-section of the Dam	61
5.3.1. A cross-section that is not flooded by water	61
5.3.2. Cross section covered by water	62
5.4. Stability Considerations	62
5.4.1. General requirement	62
5.4.2. Stability criteria	62
5.5. Stability Against Overturning	62
5.5.1. Resultant location	62
5.5.2. Criteria	63
5.6. Stability Against Shear	63
5.6.1. General	63
5.6.2. Definition of factor of safety against shear	64
5.6.3. Basic concepts, assumptions, and simplifications	64
5.6.4. Sectional analysis of a double wedge-shaped dam	65
5.6.5. Single collapse field	68
5.6.6. Design considerations	69
5.7. The stresses acting at the base of the dam	71
5.7.1. Basic pressure calculation	71
5.7.2. Permissible base pressure	71

CHAPTER VI STATIC AND DYNAMIC STRESS ANALYSIS

6.1. Stress Analysis	72
----------------------------	----

8.7.1.	Outlet buildings and other buildings	83
8.7.2.	Impact on outlet buildings	84
8.8.	Foundation Grouting and Drainage	85
8.9.	Gallery	85
8.9.1.	Grouting and drainage galleries	85
8.9.2.	Room (Chamber) door and gallery access	86
8.10.	Instrumentation	86

CHAPTER IX RE-EVALUATION OF EXISTING DAM120

9.1.	General	88
9.2.	Re-Evaluate	88
9.3.	Procedure	88
9.3.1.	Available data	88
9.3.2.	Field inspection	88
9.3.3.	Preliminary analysis	89
9.3.4.	Parameter study	89
9.3.5.	Field investigation	89
9.3.6.	Detailed analysis of the building	89
9.3.7.	Careful structural analysis	89
9.3.8.	Consent review	89
9.3.9.	Design and Specifications	89
9.4.	Consideration of Deviations from Building Design Criteria	90
9.4.1.	Limitations and risks	90
9.4.2.	Analysis and Risk	90
9.4.3.	Deviance and level of trust	90
9.5.	Building Requirements for Repair Tools	90
9.6.	Methods for Improving the Stability of Existing Buildings	90
9.6.1.	General	90
9.6.2.	Reduction of lifting forces (uplift)	90
9.6.3.	Prestressed armature	91
9.7.	Stability of Deep Collapse Fields	91
9.7.1.	Methods and Assumptions	92
9.7.2.	Armature penetration	92
9.7.3.	Armature resistance	92
9.8.	Example Problem	92

CHAPTER137

10.1.	Introduction	98
10.2.	Construction Methods	99
10.3.	Economic Benefits	100
10.3.1.	Material storage	100
10.3.2.	Fast implementation	100
10.3.3.	Spillways and Auxiliary Buildings	101
10.3.4.	Dodge and cofferdam buildings	101
10.3.5.	Other advantages	101
10.4.	Design and Construction Considerations	102
10.4.1.	Control waterproofing and seepage properties	102
10.4.2.	Village slopes	102
10.4.3.	Repair of horizontal joints	103
10.4.4.	Seepage collector	103
10.4.5.	Downstream façade that is not flooded by water	103
10.4.6.	Transverse contraction joints	103

6.1.1.	General	72
6.1.2.	Finite element analysis	72
6.2.	Dynamic Analysis	72
6.3.	Dynamic Analysis Process	73
6.4.	Interdisciplinary Coordination	73
6.5.	Earthquake response performance Criteria to the site	73
6.6.	Geological and Seismological Investigations	73
6.7.	Choosing the magnitude of the earthquake	73
6.8.	Characterization of earthquake sources	74
6.9.	Dynamic Stress Analysis Method	74
6.9.1.	General	74
6.9.2.	Spectrum response simplification method	74
6.9.3.	Finite element method	74

CHAPTER VII CONCRETE TEMPERATURE CONTROL91

7.1.	Introduction	76
7.2.	Thermal Properties of Concrete	76
7.2.1.	General	76
7.2.2.	Thermal conductivity (k)	76
7.2.3.	Diffusivity (spread) of heat (h)	76
7.2.4.	Specific heat (c = specific heat)	77
7.2.5.	Coefficient of heat expansion (coefficient of thermal expansion)	77
7.2.6.	Hydrating heat	77
7.2.7.	Tensile strain capacity	77
7.2.8.	Crawling	77
7.2.9.	Modulus of elasticity	77
7.3.	Hot Studies	77
7.3.1.	General	77
7.3.2.	Permissible peak temperature	77
7.4.	Temperature Control Method	78

CHAPTER VIII STRUCTURAL DESIGN CONSIDERATIONS106

8.1.	Introduction	80
8.2.	Contraction Joints and Construction Joints	80
8.2.1.	Contraction joint	80
8.2.2.	Construction joints	80
8.3.	Waterstops	81
8.4.	Overflow	81
8.4.1.	General	81
8.4.2.	Spillway design	81
8.4.3.	Overflow discharge	81
8.4.4.	Dynamic load	81
8.5.	Overflow Bridge	82
8.5.1.	Traffic or access	82
8.5.2.	Design criteria	82
8.5.3.	Building materials	82
8.6.	Abundant Pear	82
8.6.1.	Pear and Bridge	82
8.6.2.	Door condition	82
8.6.3.	Combination of conditions 1 and 3	83
8.6.4.	Condition 2	83
8.7.	Production Building (Outlet)	83

10.4.7. Baffles (Waterstops).....	104
Appendix A: Gravity Type Concrete Dams in Indonesia.....	105
Appendix B: Earthquake Hazard Analysis of the Cisokan Hilir (Upper) Dam Plan.....	156
Appendix C: Derivation of the General Equation of Pieces (Wedge Shape).....	197
Appendix D: Examples of Avalanche Analysis Calculations for Single and Double Cut Systems.....	205
Appendix E: Example of Stability Analysis Calculation for a Gravity Type Concrete Dam.....	212
Bibliography.....	219

LIST OF TABLES

Table 2-1 Information on Concrete Mixtures for Several Dams in the World (Varshney, RS, 1978).....	16
Table 3-1 Types of laboratory field tests for Gravity Type Concrete Dam design.....	24
Table 4-1 Correction factors for the influence of local rock/soil type stress.....	47
Table 4-2 Location classification according to NEHRP (2003).....	51
Table 4-3 Fa coefficient values for location classes.....	52
Table 4-4 Fy coefficient values for location classes.....	53
Table 4-5 Parameters of 22 earthquake accelerogram recordings for dynamic response analysis that are often used in the United States Bureau of Reclamation (USA) 56.....	57
Table 4-6 Risk factor criteria for dam safety evaluation.....	57
Table 4-7 Risk classes for dams and water structures.....	57
Table 4-8 Earthquake load criteria for dam design.....	58
Table 5-1 Stability and stress criteria.....	62
Table 9-1 Summary of forces at failure plane. Load condition No.2 (water at the gate beacon, tailwater below the failure area).....	94
Table 9-2 Summary of forces on the landslide plane. Load condition No.2 (reservoir at the top of the gate, tailwater below the landslide plane).....	94
Table A-1 Gravity Type Concrete Dams in Indonesia.....	106
Table A-2 General data for Balambano Dam.....	108
Table A-3 Balambano Dam hydrology and seismicity data.....	108
Table A-4 Balambano Dam reservoir and tailrace data.....	108
Table A-5 Balambano Dam dam and spillway data.....	108
Table A-6 Balambano Dam River circumvention data.....	108
Table A-7 Data on electricity intake, rapid pipe and powerhouse for Balambano Dam.....	108
Table A-8 Loading conditions and design parameters for stability analysis of Balambano Dam.....	117
Table A-9 Laboratory tests on test samples from rock cores in drilled holes (rock parameters).....	118
Table A-10 Aggregate gradation specifications specified.....	119
Table A-11 Summary of Chemical Cement Quality Monitoring Results.....	121
Table A-12 Summary of results of quality monitoring of physical properties of cement.....	121
Table A-13 Summary of results of Quality monitoring of fly ash Chemical properties.....	122
Table A-14 Summary of results of monitoring the quality of fly ash physical properties.....	122
Table A-15 Overview of moisture content, density and SG of rolled solid concrete.....	123
Table A-16 Overview of Compressive Strength of Rolled Solid Concrete.....	123
Table A-17 Overview of Tensile Strength of Rolled Solid Concrete.....	123
Table A-18 General data on the Cisokan Dam.....	125

Table A-19 Cisokan Dam hydrology and seismicity data.....	125
Table A-20 Data on reservoirs, dams, and spillways of Cisokan Dam.....	125
Table A-21 Data on intake, headrace tunnel, surge tank, penstock and powerhouse (electricity) of the Cisokan Dam.....	127
Table A-22 Data on mechanical and electrical equipment for the Cisokan Dam.....	127
Table A-23 Foundation design parameters according to local rock class.....	146
Table A-24 Aggregate test results.....	147
Table A-25 Properties and types of Fly Ash (ASTM C 618).....	147
Table A-26 Rolled solid concrete mix recommended maturity test results.....	148
Table A-27 Design conditions and technical specifications for concrete mix.....	148
Table A-28 Basic combinations of conventional concrete components and rolled solid concrete.....	148
Table A-29 Loading conditions and design parameters for stability analysis of the Upper Cisokan Dam.....	150
Table A-30 Loading conditions and design parameters for stability analysis of the Lower Cisokan Dam (Highest profile).....	152
Table A-31 Results of stability analysis of the Inlet building in longitudinal section.....	154
Table A-32 Results of stability analysis of the Inlet building in cross-section.....	154
Table A-33 Classification of rock masses (A).....	154
Table A-34 Classification of rock masses (B).....	155
Table A-35 Rock conditions along the water tunnel (Headrace).....	155
Table A-36 Rock support system in the Cisokan water tunnel.....	155
Table B-1 Empirical relationship between moment magnitude Mw, surface rupture length L (km), rupture area A (km2) and maximum surface displacement D (m).....	161
Table B-2 Mw & b-value as earthquake source parameters in the Cisokan PSHA analysis.....	179
Table B-3 Slip rate values for subduction and fault earthquake sources used in the Cisokan PSHA analysis.....	179
Table B-4 Hazard PGA for Cisokan with different return periods.....	192
Table B-5 Hazard 5hz for Cisokan with varying periods of return.....	193
Table B-6 Hazard 1hz for Cisokan with different return periods.....	193
Table B-7 Overview of earthquake acceleration spectrum values for building periods T= 0.020 and 0.50 seconds for various return periods from earthquake hazard analysis results.....	194
Table B-8 Overview of earthquake acceleration spectrum values for building periods T= 0.020 and 0.50 seconds for different return periods from the Indonesian Earthquake Zone Map.....	194
Table B-9 Acceleration spectrum results from the Cimandiri fault earthquake hazard analysis using several attenuation equations.....	196
Table B-10 Cisokan dam design parameters from 3 studies.....	196
Table E-1 Dam data.....	215
Table E-2 Calculation of dam size for determining moment arm.....	215
Table E-3 Calculation of lifting pressure, hydrodynamic pressure and bearing capacity factor 215.....	215
Table E-4 Calculation of forces, moments and stresses at the base of the foundation.....	216
Table E-5 Calculation of total focus and eccentricity.....	218
Table E-6 Calculation of Safety Factors for sliding, overturning and bearing capacity.....	218

LIST OF FIGURES

Figure 2-1 Cross-section of a typical overflow/dam overflowing with water.....	11	Figure 5-4 Geometry of the building foundation system.....	66
Figure 2-2 Cross-section of a typical spillway/dam that is not flooded by water.....	13	Figure 5-5 Dam foundation system, showing push wedge, dam (structural) wedge, and retaining wedge.....	66
Figure 2-3 Schematic diagram of the implementation of concrete dam construction.	17	Figure 5-6 Plane failure pattern.....	69
Figure 2-4 Construction implementation of the Sipasihporas concrete gravity dam (2004) North Sumatra; looks like a river bypass that is missed by one of the lowest construction blocks.....	18	Figure 7-1 Concrete treatment after casting by flooding the concrete surface with water, Sipasihporas Dam, South Sumatra.....	78
Figure 3-1 Lift pressure distribution without foundation drainage.....	27	Figure 7-2 Execution of casting using a bucket and compaction using a vibrating machine equipped with a spud.....	79
Figure 3-2 Lift pressure distribution with drainage gallery.....	28	Figure 8-1 Drawing of a typical outlet building for electric power.....	84
Figure 3-3 Lift pressure distribution with foundation drainage near a village slope.....	28	Figure 8-2 Drawing of a typical outlet building with open ducts.....	84
Figure 3-4 Lift pressure distribution at a fractured base with drainage, zero compression zone does not pass through the drainage.....	29	Figure 9-1 Cross section of a spillway monolith section.....	93
Figure 3-5 Lift pressure distribution in a fractured base with drainage, zero compression zone across the drainage.....	30	Figure 9-2 Free body diagram, R_y = resultant vertical forces, R_H = resultant horizontal forces, and XR = distance from the heel to the resultant location on the landslide plane.....	94
Figure 3-6 Lift pressure diagram. The dotted line depicts the distribution of lifting pressure, which must be taken into account in stability.....	32	Figure 9-3 Haunted locations.....	95
Figure 3-7 The dotted line in a lift pressure diagram depicts the lift pressure distribution that is taken into account in stability.....	32	Figure 9-4 Armature details.....	96
Figure 3-8 The occurrence of dangerous uplift pressure along an insertion or fault in the foundation (drain hole does not penetrate the porous layer).....	33	Figure 9-5 Foundation anchor: (a) grout mass by pressure injection, (b) cylindrical grout, (c) serrated anchor (multiple under-reamed).....	96
Figure 3-9 Effects along an insertion or fault if the material is water absorbent and the water permeability zone is cut by the base of the dam or by an impermeable fault.....	33	Figure 10-1 Cross-section of a typical rolled solid concrete dam.....	98
Figure 3-10 Earthquake load on a concrete gravity dam, part of the monolith that is not flooded by water.....	35	Figure 10-2 Typical work plan for a rolling solid concrete casting spreading operation.....	99
Figure 4-1 Characterization of the earthquake source area.....	38	Figure 10-3 External compaction of rolled solid concrete using vibro rollers.....	100
Figure 4-2 Flow chart for determining peak intensity at the soil/rock surface.....	40	Figure 10-4 Installation of a contraction joint using a vibrating tractor blade to insert a galvanized steel plate.....	103
Figure 4-3 Analysis steps using a deterministic approach.....	41	Figure A-1 View of Balambano Dam from the left abutment.....	107
Figure 4-4 Analysis steps with a probabilistic approach.....	43	Figure A-2 Location Map of Balambano Dam.....	109
Figure 4-5 Relationship between cumulative frequency and cumulative magnitude from 4 earthquake instruments; South - Central segment of the San Andreas fault data (Schwartz and Coppersmith, 1984).....	44	Figure A-3 General plan of Balambano Dam.....	110
Figure 4-6 Map of Indonesian earthquake zones using the Fukushima & Tanaka (1990) attenuation equation.....	49	Figure A-4 View of the elevation next to the village from the grouting of the Balambano Dam.....	111
Figure 4-7 Normalized earthquake acceleration spectrum for rock foundations ($T_s \leq 0.25$ seconds).....	50	Figure A-5 Transverse profile view of Balambano Dam.....	112
Figure 4-8 Correction factor C_n to determine the normalized earthquake acceleration spectrum with D not equal to 5%.....	50	Figure A-6 View of the instrumentation in the longitudinal profile next to the village of Balambano Dam.....	113
Figure 4-9 Design acceleration spectrum response on soil/rock surfaces adjusted to location class.....	54	Figure A-7 Transverse profile view with instruments installed.....	114
Figure 4-10 Relationship between fault distance or earthquake center and the dominant period T_p	44	Figure A-8 Transverse profile view of the spillway.....	115
Figure 5-1 Base loading conditions in gravity concrete dam design.....	59	Figure A-9 Profile view of the electricity facility (Power Facility).....	116
Figure 5-2 Relationship between stressed foundation base and resultant location.....	63	Figure A-10 Overview of aggregate gradations for rolled solid concrete combinations.....	120
Figure 5-3 Collapse envelope.....	64	Figure A-11 Overview of increasing the compressive strength of rolled solid concrete.....	123
		Figure A-12 Location of the Upper Cisokan and Lower Cisokan Dams in West Java.....	124
		Figure A-13 Cisokan Dam situation map.....	126
		Figure A-14 Geological map of the Cisokan Hulu Dam excavation plan (preliminary design).....	128
		Figure A-15 Plan of the Upper Cisokan Dam (preliminary design).....	129
		Figure A-16 Elevation view of the Upper Cisokan Dam village (preliminary design).....	130
		Figure A-17 Cross profile of non-overflow and overflow sections of the Upper Cisokan Dam (preliminary design).....	131
		Figure A-18 Section of the contraction joint of the Cisokan Hulu Dam (preliminary design).....	132
		Figure A-19 Detailed view of the Cisokan Hilir Dam contraction joint section (preliminary design).....	133
		Figure A-20 Detailed view of the Cisokan Hilir Dam contraction joint section (continued).....	134

Figure A-21: Detailed view of the contact area between the coating and the casting area of the Cisokan Hilir Dam (continued).....	135
Figure A - 2 - 2 : Plan view of the spillway plan for the Cisokan Hilir Dam (preliminary design).....	136
Figure A-23: Cross-section view of the spillway from the Cisokan Hilir Dam (preliminary design).....	137
Figure A-24 Detailed view of the AA spillway from the Cisokan Hilir Dam (preliminary design).....	138
Figure A-25 Plan view of the Cisokan Hilir Dam circumvention work plan (preliminary design).....	139
Figure A-26 Plan and longitudinal section of the Cisokan Hilir Dam circumvention tunnel (preliminary design).....	140
Figure A-27 Plan and detail of instrumentation on the longitudinal section of the Cisokan Hilir Dam (preliminary design).....	141
Figure A-28 Plan and detailed view of instrumentation on a cross-section of the Cisokan Hilir Dam spillway (preliminary design).....	142
Figure A-30 Intake Structure for the Cisokan power plant (preliminary design).....	143
Figure A-31 Cisokan Outlet structure arrangement (initial design).....	144
Figure A-32 Cimandiri fault MDE Earthquake Acceleration Spectrum Mw = 6.9 with the closest distance of 5 km, depth of 25 km with D = 5%.....	145
Figure B-1 The World's Major Plates and their direction of movement.....	149
Figure B-2 Distribution of world earthquake events due to plate interactions from 1990 - 2000 (taken from USGS).....	156
Figure B-3 Distribution of Indonesian earthquake epicenters, 1990 - 2000.....	157
Figure B-4 Seismotectonic map around Cisokan by Kertapati et.al. 1998.....	158
Figure B-5 Illustration of seismic moment values from an earthquake source.....	159
Figure B-6 Stages of earthquake risk analysis using the DSHA Method (Kramer, SL, 1996).....	161
Figure B-7 Stages 1-5 of probabilistic earthquake risk analysis (PSHA) for Peak Ground Acceleration (PGA).....	163
Figure B-8 Stage 6 of probabilistic earthquake risk analysis (PSHA) for Peak Ground Acceleration (PGA): Seismic Hazard curve shape and its application to PGAd design estimates for period Td and event probability Pd.....	165
Figure B-9 Three-dimensional earthquake source model.....	166
Figure B-10 Correlation of various magnitude scales (Idris, 1985).....	170
Figure B-11 Empirical time window criteria.....	169
Figure B-12 Empirical distance window criteria.....	171
Figure B-13 Source model of the Lower Cisokan earthquake up to a radius of 500 km.....	171
Figure B-14 Model Completeness of Earthquake Data for Indonesia.....	172
Figure B-15 Map of earthquake epicenters at a depth of 0 km - 50 km in the period 1963 - 2008 which was used as a source for the Shallow Background earthquake.....	173
Figure B-16 Map of earthquake epicenters at a depth of 50 km - 100 km in the period 1963 - 2008 which was used as a source for the Deep-1 Background earthquake.....	174
Figure B-17 Map of earthquake epicenters at a depth of 100 km - 150 km in the period 1963 - 2008 which was used as a source for the Deep-2 Background earthquake.....	174
Figure B-18 Map of earthquake epicenters at a depth of 150 km - 200 km in the period 1963 - 2008 which was used as a source for Deep-3 Background earthquakes.....	174

Figure B-19 Map of earthquake epicenters at a depth of 200 km - 300 km in the period 1963 - 2008 which was used as a source for Deep-4 Background earthquakes.....	175
Figure B-20 Cumulative number of earthquake events in Cisokan from 1963-2008 within a radius of ≤ 500 km as a function.....	177
Figure B-21 b-values of the frequency-magnitude distribution as a function of magnitude for the Cisokan area.....	177
Figure B-22 b-values of the frequency-magnitude distribution as a function of depth for the Cisokan area.....	177
Figure B-23 Seismicity rates for the Cisokan region using the least squares method (Gutenberg & Richter, 1954) and the Maximum Likelihood method.....	177
Figure B-24 Relationship between earthquake magnitude, slip-rate and rock age.....	178
Figure B-25 Distribution of earthquake recording data in Shallow Crustal in the Active Region.....	180
Figure B-26 Effect of earthquake magnitude on attenuation (Abrahamson and Silva, 1997).....	181
Figure B-27a PHA and Spectral Acceleration (Abrahamson and Silva, 1997).....	182
Figure B-27b PHA and Spectral Acceleration (Abrahamson and Silva, 1977).....	182
Figure B-28 PHA and spectral acceleration (Abrahamson and Silva, 1977).....	183
Figure B-29 Attenuation in the active region and Subduction (Abrahamson and Young and Young (1997).....	184
Figure B-30 Attenuation in active and stable regions (Boore, 1997 and Toro, 1997).....	184
Figure B-31 Attenuation rate for body and surface waves.....	186
Figure B-32 Logic tree for the background earthquake source model used in the study.....	190
Figure B-33 Logic tree for the subduction earthquake source model used in the study.....	191
Figure B-34 Logic tree for the earthquake fault source model used in the study.....	191
Figure B-35 Hazard curve for PGA spectral acceleration in bedrock in the Cisokan area.....	192
Figure B-36 Hazard curve for 5 Hz spectral acceleration in bedrock in the Cisokan area.....	193
Figure B-37 Hazard curve for 1 Hz spectral acceleration in bedrock in the Cisokan area.....	194
Figure B-38 Earthquake acceleration spectrum in a deterministic manner with Mw = 7.6 and R = 8.4 km Cimandiri fault with various attenuations.....	195
Figure B-39 Comparison of earthquake acceleration spectra using several attenuation equations.....	195
Figure C-1 Geometric sign agreement.....	197
Figure C-2 Geometry of the ith typical cut and adjacent cuts.....	198
Figure C-3 Pressure distribution and resultant forces acting on a typical cut.....	199
Figure C-4 Free body ith section diagram.....	199
Figure C-5 Derivation of the general equation (sheet 1 of 3).....	200
Figure C-5a Derivation of the general equation (sheet 2 of 3).....	201
Figure C-5b Derivation of the general equation (sheet 3 of 3).....	201
Figure C-6 Diagram of the ith section of a free body with an armature.....	202
Figure C-7: Derivation of the general equation for a piece subjected to an armature force (sheet 1 of 2).....	203
Figure C-8 Derivation of general equations for pieces subjected to anchor forces (sheet 2 of 2).....	205
Figure E-1 Geometry and forces acting on the dam body.....	212
Figure E-2 Voltage- $\sum V_i$, $\sum H$ and $\sum M_i$ at the base of the dam foundation.....	213

LIST OF CONTENTS

LIST OF CONTENTS.....	i
1. SCOPE.....	1
2. NORMATIVE REFERENCES.....	1
3. TERMS AND DEFINITIONS.....	1
4. GENERAL TERMS AND CONDITIONS.....	3
4.1. General.....	3
4.2. Reservoir Age.....	4
4.3. Reservoir Operation and Maintenance.....	5
4.4. Flowchart of Methods for Implementing Reservoir Sedimentation Surveys and Monitoring.....	6
4.5. Reservoir Sedimentation Survey and Monitoring.....	9
5. DESCRIPTION OF THE RIVER FLOW AREA RESERVOIR LOCATION.....	11
5.1. General.....	11
5.2. Description of Hydrological Conditions.....	12
5.3. Description of Tributaries Affecting the Reservoir.....	13
6. SAMPLING AND SEDIMENT ANALYSIS IN RIVER FLOWS AND RESERVOIRS.....	14
6.1. General.....	14
6.2. Determining Locations for Sediment Monitoring and Measurement.....	14
6.2.1. On the main river and rivers that enter the reservoir.....	14
6.2.2. In the reservoir area.....	14
6.3. Sediment Force Measurement.....	14
6.3.1. Flyover Sediment Transport Measurement.....	15
6.3.2. Basic Sediment Transport Measurements and Samples of Sedimentary Material.....	20
7. CALCULATION OF SEDIMENT TRANSPORT RATE AND RESERVOIR SEDIMENTATION RATE.....	24
7.1. General.....	24
7.2. Flying Sediment Transport.....	25
7.3. Basic Sediment Transport.....	25
7.4. Analysis of Sediment Transport using Empirical Methods or Formulas.....	26
7.5. Analysis of Sediment Transport using Numerical or Mathematical Models.....	30
8. MEASUREMENT OF THE RESTRICTED TOPOGRAPHY AND BATHYMETRY.....	31
8.1. General.....	31
8.2. Equipment.....	32
8.2.1. GPS Equipment.....	32
8.2.2. Echo Sounder.....	32
8.2.3. Measurement of Terrestrial Topography around the Reservoir Inundation Area.....	32
8.4. Reservoir Survey Techniques.....	35
8.4.1. Reservoir Bank Erosion and Landslides.....	35
8.4.2. Density and Distance Measurement Paths.....	35
8.4.3. Selection of an Adequate Hydrographic Data Collection System and Software.....	38
8.5. Positioning with GPS.....	39
8.5.1. Absolute Positioning Method.....	41
8.5.2. GPS Differential Positioning Method for RTK GPS System.....	41
8.5.3. Error - GPS Error.....	42
8.5.4. Horizontal and Vertical Control.....	43
8.6. Bathymetry Measurements.....	44

**SURVEYING AND MONITORING RESERVOIR
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8.6.1. Bathymetry Measurement Using an Echo Sounder	44
8.6.1.1. Bathymetry Measurement with Single Beam Echo Sounder	45
8.6.1.2. Bathymetry Measurement with Echo Sounder Multi Transducer	46
8.6.1.3. Bathymetry Measurement with Echo Sounder Multibeam	50
8.6.2. Survey Accuracy and Quality	53
8.6.3. Calibration of Echo Sounder Measuring Instruments	56
8.6.4. Bathymetry Measurement Procedure	58
8.7. Measurement results	59
8.8. Preparation of Measurement Results Data Format and Delineation	63
9. CALCULATION OF RESERVOIR CAPACITY AND SEDIMENTATION RATE	63
9.1. Reservoir Capacity Calculation	63
9.2. Volume and Thickness of Reservoir Sediment Deposits	64
9.3. Analysis of Reservoir Sedimentation Rates	65
9.3.1. Sediment Capture Efficiency (Trap Efficiency)	65
9.3.2. Estimated Sediment Compaction Rate	66
9.4. Analysis of Reservoir Service Life	68
9.4.1. Reservoir Service Life Plan	68
9.4.2. Remaining Reservoir Service Life	69
10. REPORTING RESULTS OF SURVEYS AND MONITORING OF RESERVOIR SEDIMENTATION	73
10.1 General	73
10.2 Contents of the report	74
10.3 Report Validation	74
BIBLIOGRAPHY	75
Appendix 1 USLE and MUSLE Equations for Predicting Reservoir Sedimentation Rates	76
Appendix 2 Calculation of Total Sediment Transport Using the Modified Einstein Method	78
Appendix 3 Location Map and BM Coordinate Table for Kedung Ombo Reservoir	90
Appendix 4 Coordinate Transformation	91
Appendix 5 Sketch of Tying Depth Values to Average Sea Level	96
Appendix 6 Steps for Measuring Bathymetry and Terrestrial Topography	99

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WATER POWER

CLASSIFICATION OF DAM HAZARDS

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LIST OF CONTENTS

CHAPTER I INTRODUCTION.....	1
1.1. General.....	1
1.2. Understanding.....	1
1.3. Purpose and Objectives.....	1
1.4. Scope.....	1
1.5. Normative Reference.....	2
1.6. Things that need to be considered.....	4
1.7. Validity and Limitations.....	4
CHAPTER II DISTRIBUTION OF DAM HAZARD CLASS.....	5
2.1. General.....	5
2.2. Hazard Level Determination Method.....	6
2.3. Population At Risk (PenRis).....	8
2.4. Economic Losses.....	10
2.5. Seri Dam.....	10
CHAPTER III ESTIMATION OF FLOODING AREA.....	11
3.1. General.....	11
3.2. Inundation Studies that Have Been Conducted.....	12
3.3. Technical Considerations.....	12
3.4. Dam Collapse Analysis.....	13
3.4.1. Dam Collapse Scenario.....	13
3.4.2. Flood Search End Point.....	15
3.4.3. Dam Failure Analysis Procedure.....	15
3.4.4. Flood Peak Height and Speed.....	16
CHAPTER IV IDENTIFICATION OF FLOOD HAZARDS.....	17
4.1. General.....	17
4.2. Dangerous Flood Height and Speed.....	17
4.3. Public Facilities Buildings, Permanent Residences, and Workplaces.....	19
4.4. Highway.....	20
4.5. Path for Pedestrians.....	21
4.6. Campgrounds, Recreation Areas and Mobile Homes.....	21
4.7. Areas with Mixed Risk components.....	22
4.8. Economic Losses.....	22
WORD SIMILARS.....	24
REFERENCE LIST.....	25
ATTACHMENTS - ATTACHMENTS	
Appendix A.....	28
Appendix B.....	37
Appendix C.....	49

BOOK 1

**PLANNING AND IMPLEMENTATION OF GRIND
SOLID CONCRETE DAM**

Decision of the Director General of Water Resources

Number: 305/KPTS/D/2011

Date: 30 September 2011

DEPARTMENT OF GENERAL WORKS

DIRECTORATE GENERAL OF WATER RESOURCES

4.4.	Field Adjustments for Mixture Proportions	30
CHAPTER V PROPERTIES OF MILLED SOLID CONCRETE		
5.1.	General	31
5.1.1.	Testing	31
5.1.2.	Strength and Elasticity	31
5.2.	Strength	32
5.2.1.	Compressive Strength (f_c)	33
5.2.2.	Tensile Strength	35
5.2.2.1.	Direct Tensile Strength (direct) f_{dt}	35
5.2.2.2.	Direct Tensile Strength of Joints Between Layers	36
5.2.2.3.	Splitting Tensile Strength f_{dt}	37
5.2.2.4.	Flexural Tensile Strength	38
5.2.2.5.	Dynamic Tensile Strength	39
5.2.3.	Shear Strength	39
5.2.3.1.	Parent Shear Strength	40
5.2.3.2.	Shear Strength of Layer Joints (from core samples)	40
5.3.	Elastic Properties	41
5.3.1.	Modulus of Elasticity (E)	41
5.3.1.1.	Elasticity Modulus Value	41
5.3.1.2.	Tensile Strength (E) Is Estimated to be the Same as Compressive Strength (E _c)	42
5.3.1.3.	Continuous Modulus of Elasticity (E _{sub})	42
5.3.1.4.	ACI Formula	42
5.3.2.	Poisson's ratio	42
5.4.	Crawling	43
5.5.	Tensile Strain Capacity	44
5.6.	Volume Change	45
5.6.1.	Dry Shrinkage	45
5.6.2.	Hydration Shrinkage (autogenous shrinkage)	45
5.7.	Thermal Properties	46
5.8.	Permeability	46
5.9.	Density	46
5.10.	Durability	47
5.10.1.	Resistance to Abrasion or Erosion	47
5.10.2.	Resistance to Freezing – Thawing	47
CHAPTER VI DESIGN AND CONSTRUCTION CONSIDERATIONS		
6.1.	Design and Construction Considerations	49
6.1.1.	General	49
6.1.2.	Application of Rolled Solid Concrete for Various Structures	49
6.2.	Considerations in the Design of Grind Solid Concrete Dam Structures	49
6.2.1.	Lifting Force on the Body of a Grind Solid Concrete Dam	50
6.2.2.	Minimum Safety Value Stability Against Shear	50
6.2.3.	Reinforcement in Rolled Solid Concrete	51
6.2.3.1.	Armature Reinforcement	51
6.2.3.2.	Structural Reinforcement	51
6.3.	Consideration of Seepage	51
6.3.1.	Membrane Systems	52
6.3.2.	Drainage System	53
6.4.	Layout of Rolled Solid Concrete Construction Operations	53
6.4.1.	Aggregate Usage During BPG Deployment Time	53

LIST OF CONTENTS

DECISION LETTER OF THE DIRECTOR GENERAL OF WATER RESOURCES	i
WELCOME	iii
FOREWORD	iv
LIST OF CONTENTS	v
LIST OF TABLES	x
LIST OF FIGURES	xii
CHAPTER I INTRODUCTION	1
1.1.	Background
1.2.	Purpose and Objectives
1.3.	Scope
1.4.	Normative Reference
1.5.	Understanding
CHAPTER II APPLICATION OF MILLED SOLID CONCRETE	
2.1.	General
2.2.	Basic Types of Grind Solid Concrete Dam Mixes
2.3.	Advantages of Using Rolled Solid Concrete
2.3.1.	Cost
2.3.2.	Fast Construction Time
2.3.3.	Overflow Buildings and Complementary Buildings
2.3.4.	Dodge Building
2.3.5.	Other Benefits
2.4.	Disadvantages of Using Grind Solid Concrete Dams
CHAPTER III INVESTIGATION AND SELECTION OF MATERIALS	
3.1.	General
3.2.	Cementitious material (cementitious material)
3.2.1.	Cement
3.2.2.	Pozzolan
3.3.	Aggregate
3.3.1.	Aggregate for Rolled Solid Concrete
3.3.2.	Refined Grains in Aggregate
3.4.	Water
3.5.	Chemical Additives (admixture)
3.5.1.	Additional Materials for Water Reducing and Retarding
3.5.2.	Air Bubble Forming Additives (air-entraining)
CHAPTER IV DESIGN OF MILLED SOLID CONCRETE MIXES	
4.1.	General
4.2.	Selection of Proportions for Solid Rolled Concrete Mixture Durability
4.2.1.	Strength (strength)
4.2.2.	Ease of Work (workability)
4.2.3.	Heat Generation (generation of heat)
4.2.4.	Aggregate
4.2.5.	Water content
4.3.	Procedure for Selection of Proportions for Grind Solid Concrete Mix

6.4.2.	Location of Grind Solid Concrete Production Installation	53
6.4.3.	Densely Populated Areas	54
6.5.	Test Program	54
6.5.1.	Approach to Testing	54
6.5.2.	Material Test	55
6.5.3.	Construction Phase Full-Scale Trial	55
6.5.4.	Strip Test at the Construction Stage	55
6.6.	Facing Systems and Techniques (facing systems and techniques)	55
6.6.1.	Reasons for Using Face Coatings	55
6.6.2.	Face Layer System Type	56
6.6.3.	Simultaneous Placement of Rolled Solid Concrete with Conventional Concrete Face Coating or Base Coating of Support Foundations	57
6.6.4.	Sliding Molding System (slip form) Kerb	57
6.6.5.	Face Layer System with Precast Concrete	57
6.6.6.	Slopes Without Compaction	58
6.6.7.	Rolled Solid Concrete Surface With Molds	59
6.7.	Coating Surface	59
6.7.1.	Design	59
6.7.2.	Quality	60
6.8.	Crack Control	61
6.8.1.	Cracks in Grind Solid Concrete Structures	61
6.8.2.	Cracks Due to Temperature	61
6.8.3.	Temperature Control	61
6.8.4.	Initial Cooling Technique (pre-cooling)	61
6.8.5.	Transverse Contraction Joints (transverse)	62
6.8.6.	Cracks Due to Foundation Impact	62
6.8.7.	Corner Cracks in Embedded Structures (Re-entrant Corner)	62
6.8.8.	Water Block (water stop) and Membrane	62
6.9.	Gallery for Seme Drainage and Injection	64
6.9.1.	Gallery	64
6.9.2.	Gallery Removal	64
6.10	Production Building	66
6.11	Overflow	66
6.11.1	Erosion	66
6.11.2	Surface Improvement for High-Velocity Flow Conditions	67

CHAPTER VII CONSTRUCTION METHODS AND EQUIPMENT69

7.1.	General	69
7.1.1.	Rolled Solid Concrete Production Rate	69
7.1.2.	Coordination of System Activities	69
7.1.3.	Segregation	70
7.2.	Rolled Solid Concrete Production Installation (RCC production plant)	70
7.2.1.	Aggregate Inventory (Stockpile)	70
7.2.2.	Aggregate Supply System (feed system)	71
7.2.3.	Mass Measuring System (mass batch system)	71
7.2.4.	Continuous Supply System	71
7.2.5.	Mixer Measuring Installation (batch mixer)	72
7.2.6.	Continuous Mixer (continuous mixer)	72
7.2.7.	Mixer Uniformity	72
7.3.	Grind Solid Concrete Transportation System	73
7.3.1.	Conveyor Belt System	73
7.3.2.	Motion Conveyor Belt System (mobile)	74

7.3.3.	Transportation System with Vehicles	74
7.3.4.	Combination System	75
7.3.5.	Cable and Gondola Systems	76
7.4.	Rolled Solid Concrete Placement Procedure	77
7.4.1.	Expansion	77
7.4.2.	Compression	78
7.5.	Coating Surface	81
7.5.1.	Surface Moisture Conditions	82
7.5.2.	Coating Surface Preparation	82
7.5.3.	Application of Mortar Base Coating (bedding mortar)	85
7.5.4.	Alternative Base Layer Mixtures (bedding)	85
7.5.5.	Weather Conditions	86
7.6.	Placement of Rolled Solid Concrete on the Foundation	87
7.7.	Rolled Solid Concrete Facing System	87
7.7.1.	Precast Concrete Panels	87
7.7.2.	Simultaneous Placement of BPG, Conventional Concrete Face Coating and Support Coating	88
7.7.3.	Curb Molding System	89
7.7.4.	Systems with Molds	89
7.8.	Installation of Connections, Water Blocks and Drainage	89
7.8.1.	Transverse Contraction Joints	89
7.8.2.	Combined Water Block and Drainage	90
7.8.3.	Facial Drainage (face drain)	90

CHAPTER VIII QUALITY MANAGEMENT AND QUALITY CONTROL93

8.1.	Quality management	93
8.2.	Quality Control	93
8.2.1.	Contractor Quality Control Program (Contractor quality control)	93
8.2.2.	Quality Control in Rolled Solid Concrete	93
8.3.	Activities Before Placement of Grind Solid Concrete	94
8.3.1.	Technical Considerations and Instructions for Field Officers	95
8.3.2.	Coordination of Construction Implementation	95
8.3.3.	Mixer-Mixer Installations (Batch Mixing Plants)	96
8.3.4.	Test Strip (test strip)	96
8.3.5.	Full-Scale Trial	96
8.4.	Activities during Grind Solid Concrete Placement	98
8.4.1.	Placement Inspection	98
8.4.2.	Monitoring Consistency and Ease of Working with BPG	99
8.4.3.	Monitoring the Density of Rolled Solid Concrete	99
8.4.4.	Other Tests	99
8.4.4.1.	Fine and Coarse Aggregate Gradation, CRD-C (ASTM C 136)	100
8.4.4.2.	Finer Gradation Percentage than sieve 75µm (No. 200), CDR-C 105 (ASTM C 17)	100
8.4.4.3.	Determination of Water Content, CRD-C 113 (ASTM 117)	100
8.4.4.4.	Vibe Testing	100
8.4.4.5.	Determination of Mortar Content	101
8.4.4.6.	Determining Density Targets	101
8.4.4.7.	Wet Density Monitoring of Rolled Solid Concrete	102
8.4.4.8.	Temperature, CRD-C 3 (ASTM C 1064)	103
8.4.4.9.	Air Content, CRD-C 41 (ASTM C 231)	103
8.4.4.10.	Making Test Samples for Concrete Strength	103
8.4.5.	Monitoring Test Results with Graphics	105

8.4.6. Visual Observation as an Inspection Tool.....	106
8.5. Post-Construction Activities	107
8.5.1. Drilling Program.....	107
8.5.2. Instrumentation	107
8.5.3. Documentation	107

CHAPTER XI CRAZY SOLID CONCRETE PERFORMANCE.....17

9.1. General	17
9.2. Watertightness and Seepage Control Measures	108
9.2.1. Effect of BPG Mixtures on Seepage	109
9.2.2. Special Repairs and Seepage	110
9.2.2.1. Conventional Concrete Surfaces.....	110
9.2.2.2. Mortar Base Coating (mortar bedding) on Part Width.....	110
9.2.2.3. Mortar Base Coating (mortar bedding) over the Entire Width.....	110
9.2.3. Geomembrane.....	110
9.2.4. Water Block and Drainage	111
9.2.4.1. Water Block.....	111
9.2.4.2. Drainage	111
9.2.4.3. Sealing (sealant)	111
9.2.5. Gallery	112
9.3. Joints and Cracks	112
9.3.1. Transverse Contraction Joints (transverse).....	112
9.3.2. Thermal Cracking.....	113
9.3.3. Foundation-Related Cracks	114
9.4. Durability	114
9.4.1. Erosion – Abrasion.....	115
9.4.2. Frozen and Thawed Process	115
9.5. Chemical Influences.....	116
9.5.1. Calcium carbonate.....	116
9.5.2. Hydrogen Sulfide.....	117
9.5.3. Other Chemical Influences	117

APPENDIX - A : Glossary of Terms and Abbreviations

APPENDIX - B :

- Table B.1: List of Grind Solid Concrete Dams (> 15 m) in the World
- Table B.2: List of RCD Grind Solid Concrete Dams in Japan

APPENDIX - C: Example of Rolled Solid Concrete Mix Design

LIST OF FIGURES

Figure 2.1. Cost of Rolled Solid Concrete (based on prices in USATHG-1998).....	15
Figure 4.1. Equivalent Cement Content VS. Compressive Strength; Average Historical Data For BPG Without Pozzolan	22
Figure 4.2. Equivalent Cement Content VS. Compressive Strength; Average Historical Data For BPG With Pozzolan.....	22
Figure 4.3. Vibe Test Equipment	23
Figure 4.4. Vibrating Consistency (VC) Test Equipment With Large Container	24
Figure 4.5. VC Test Equipment With Standard Size Containers (roller compacted dams)	24
Figure 4.6. Ideal Gradation of Coarse Aggregate and Gradation Limits of Fine Aggregate	27

Figure 6.1. Example of installing a membrane layer with PVC as the base material installed on the village face of Balambano Dam, South Sulawesi.....	52
Figure 6.2. Precast Concrete Panels.....	58
Figure 6.3. Water Blocks in Grind Solid Concrete Dams	63
Figure 6.4. Gallery Construction Using the Method of Replacing Sand Gravel with Wooden Moldings.....	65
Figure 6.5. After Excavating the Sand Gravel, the Gallery Walls Are Uneven and Rough.....	65
Figure 6.6. Detail of Balambano Dam Spillway Section.....	68
Figure 7.1. Padar Grind Concrete Pouring Activity Using Conveyor Belts and Heavy Equipment at Balambano Dam, South Sulawesi.....	76
Figure 7.2. Layout of Rolled Solid Concrete Installation and Transportation with Conveyor Belts at the Gassan Dam in Japan.....	76
Figure 7.3. Use of cables and gondolas as transportation.....	77
Figure 7.4. Activities for pouring rolled solid concrete using a dump truck.....	80
Figure 7.5. Activities for Spreading Rolled Solid Concrete Using a Dozer.....	80
Figure 7.6. Compaction of Rolled Dense Concrete with a Vibrating Roller.....	81
Figure 7.7. Mortar Base Coating Placement Activities (bedding mortar).....	83
Figure 7.8. Example of Applying Base Coating to BPG Layer Joints.....	84
Figure 7.9. Shear Resistance in Layer Joints.....	85
Figure 7.10. Layout of Operations for Placing and Spreading Rolled Solid Concrete.....	86
Figure 7.11. Installation of Water Retainers and Drainage Pipes at Connections.....	91
Figure 7.12. Installation of Sheet Metal in Contraction Joints with Blade Vibrator.....	91
Figure 7.13. Transverse Contraction Joints With Joint Material Wrapped In Plastic.....	92
Figure 8.1. Compaction Trial at Koto Panjang Dam Cofferdam	97
Figure 8.2. Nuclear Density Measuring Instrument (nuclear gauge).....	103

LIST OF TABLES

Table 2.1. Classification of Grind Solid Concrete Dams	12
Table 4.1. Ideal gradation of coarse aggregate	26
Table 4.2. Fine Aggregate Gradation Boundaries	26
Table 4.3. A _r i Content, Sand Content, Mortar Content, Paste - Mortar Ratio, and Air Bubbles for Various Nominal Aggregate Sizes. (Typical numbers used in Estimating BPG Trial Mix Proportions).....	27
Table 5.1. Conventional Period Concrete (Cannon, 1995)	37
Table 5.2. Rolled solid concrete, consistent, easy to work with ≤30 seconds Vebe Vibration (Cannon 1995).....	37
Table 5.3. Rolled Dense Concrete, Low Workability Consistency > 30 Seconds Vebe Vibration (Cannon 1995).....	38
Table 5.4. Typical Tensile Strain Capacity Range.....	44
Table 8.1. Grind Solid Concrete Dam Testing Frequency	104

LIST OF CONTENTS

DECISION LETTER OF THE DIRECTOR GENERAL OF WATER RESOURCES	i
WELCOME	ii
FOREWORD	iv
LIST OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	xi
CHAPTER I INTRODUCTION	1
1.1. General	1
1.2. Purpose and Objectives	1
1.3. Scope	1
1.4. Understanding	2
CHAPTER II APPLICATION OF MILLED SOLID CONCRETE.....	9
2.1. General	9
2.2. Geotechnical Research for Gravity Concrete Buildings	9
2.3. Area. Coverage of the Investigation Area	10
2.4. Stages of Investigation of the Gilas Solid Concrete Dam Foundation	11
2.5. Rock Mass Characteristics	13
2.5.1. Geological Description	14
2.5.2. Rock Core Descriptors	14
2.5.3. Additional Descriptors	18
2.5.3.1. Discontinuity Plane Orientation	18
2.5.3.2. Discontinuity Plane Thickness	19
2.5.3.3. Roughness in Discontinuity Fields	19
2.5.3.4. Continuity From Discontinuity Fields	20
2.5.3.5. Field. Fault Discontinuities and Unconformities	21
2.5.3.6. Caves	21
2.5.4. Rock Laboratory Testing	22
2.6. Rock Mass Classification	23
2.6.1. Available Classification Systems	23
2.6.2. Rock Quality Designation (RQD)	24
2.6.3. Geomechanical Classification	25
2.6.4. Q-System	25
2.6.5. Geological Strength Index (Geological Strength Index)	27
2.7. Shear Strength	29
2.7.1. Characteristics of Rock Collapse	29
2.7.2. Whole Rock (Intact Rock)	29
2.7.3. Discontinuity	29
2.7.4. Discontinuity Fields With Filling	30
2.8. Collapse Criteria	31
2.8.1. Definition of Collapse	31
2.8.2. Linear Criteria	33
2.8.3. Bilinear Criteria	33
2.9. Shear Strength Test	35
2.10. Shear Strength Testing Program	35
2.10.1. Sensitivity	35

BOOK II

ROCK FOUNDATIONS, INSTRUMENTATION SYSTEMS AND WATER BOOTHS OF MILLED SOLID CONCRETE DAM

Decision of the Director General of Water Resources

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MINISTRY OF PUBLIC WORKS

DIRECTORATE GENERAL OF WATER RESOURCES

2.10.2. Loading Conditions.....	36
2.10.3. Shear Test Versus Failure Model.....	36
2.10.3.1. Triaxial Test in the Laboratory.....	36
2.10.3.2. Laboratory Direct Shear Test.....	36
2.10.3.3. In-situ Direct Shear Test.....	36
2.10.3.4. In-situ Uniaxial Compressive Strength Test.....	37
2.10.3.5. Selection of Adequate Test Objects.....	37
2.11. Selection of Shear Strength Design Parameters.....	37
2.11.1. Evaluation Procedure.....	37
2.11.2. Procedure Selection.....	38
2.11.2.1. Massive Rocks (Intact Rock).....	38
2.11.2.2. Discontinuities Without Fill (Clean Discontinuities).....	40
2.11.3. Discontinuity With Filling (Filled Discontinuity).....	40
2.11.4. Combination Model.....	41
2.12. Deformation and Settlement.....	42
2.13. Modulus Definition.....	42
2.13.1. Initial Tangent Modulus.....	43
2.13.2. Modulus of Elasticity.....	43
2.13.3. Modulus Recovery.....	43
2.13.4. Deformation Modulus.....	43
2.14. Test Methods for Estimating Modulus.....	43
2.14.1. Uniaxial Compression Test.....	44
2.14.2. Uniaxial Jacking Test.....	44
2.14.3. Pressure Test (Pressure Meter).....	45
2.14.4. Plate Load Test.....	45
2.14.5. Flat Jack Test (Flat-Jack).....	45
2.14.6. Pressure Chamber Test.....	45
2.14.7. Radial Jacking Test.....	46
2.14.8. Drill Hole Jacking Test.....	46
2.14.9. Tunnel Relaxation Test.....	46
Other Methods For Estimating Modulus.....	46
2.15. 2.15.1. Seismic Method.....	46
2.15.2. Empirical Method.....	47
2.16. Considerations for Selection of Design Modulus Values.....	48
2.16.1. Variability In Modulus Definitions.....	48
2.16.2. Variability In Methods.....	48
2.16.3. Rock Mass Variability.....	48
2.17. Selection of Design Modulus.....	49
CHAPTER III INSTRUMENTATION SYSTEM.....	50
3.1. General.....	50
3.2. Technical Guidelines and Instructions.....	50
3.3. Pressure Monitoring.....	56
3.3.1. Open Piezometer.....	56
3.3.2. Closed Piezometer.....	57
3.3.3. Total Pressure Cell.....	59
3.4. Seepage Monitoring.....	61
3.5. Temperature Measurement.....	63
3.6. Deformation Monitoring.....	64
3.6.1. Survey System.....	64
3.6.2. Deviation Meter.....	67
3.7. Rotational Motion Monitoring.....	69
3.8. Joint and Crack Monitoring.....	71
3.8.1. Mechanical Joint Meter.....	71
3.8.2. Joint Electric Meter.....	71
3.9. Strain Monitoring.....	75
3.10. Seismic Measuring Instruments.....	76
3.11. Minimum Instrumentation.....	78
CHAPTER IV WATER BLOCK (WATERSTOP).....	81
4.1. General.....	81
4.2. Water Block Material.....	81
4.3. Shape and Type of Water Block.....	81
4.3.1. Non-Metal Water Block Fabrication.....	82
4.3.2. Requirements for Dimensions and Sizes of Water Blocks.....	83
4.4. Application.....	83
4.5. Construction execution.....	85
4.6. Installation.....	86
4.7. Design.....	86
4.7.1. Conventional Design Considerations.....	87
4.7.2. Unconventional Design Considerations.....	87
4.8. Sampling (sampling).....	88
4.8.1. Material.....	88
4.8.2. Sampling at the Factory.....	88
4.8.3. Sampling at Project Sites.....	89
4.8.4. Sample Retest.....	89
4.9. Quality Testing and Specifications.....	89
4.9.1. Testing.....	89
4.9.2. Specification.....	89

LIST OF FIGURES

Figure 2.1. Minimum Area for Geotechnical Investigation of Concrete Dams.....	10
Figure 2.2. Geological Survey Flow Chart for Rocks for Dam Foundations.....	13
Figure 2.3. Factors and Parameters of Fractures in Rocks that Influence Geological Mapping of Rock Mass Characteristics (Wyllie, 1999).....	18
Figure 2.4. Discontinuity Plane Roughness.....	20
Figure 2.5. Discontinuity Field.....	21
Figure 2.6. Example of Classifying Rocks Based on RQD Values.....	24
Figure 2.7. Geomechanical Classification System for Rock Mass Rating (RMR) (Bieniawski, 1984, 1989).....	26
Figure 2.8. Q Rating System for Rock Mass Classification (Barton, Lien and Lunde, 1974).....	27
Figure 2.9. Chart for estimating the Geological Strength Index (GSI) (Hoek & Brown, 1997).....	28
Figure 2.10. Effect of Selected Test Object Size on Coarse and Fine Discontinuity Areas (Deere Etal, 1967).....	30
Figure 2.11. Shear Test Failure (Nicholson 1983a).....	32
Figure 2.12. Hypothesis of Stress-Strain Deformation Curve from Directly Drained Shear Test a). Strain softening, b). Elastic-plastic, and c). Strain hardening of the material (strain hardening) (Nicholson 1983a).....	32
Figure 2.13. Mohr-Coulomb Related to Normal Stress and Shear Stress.....	33

Figure 2.14 Typical Bilinear Estimates and Curved Failure Curves in Rock
Discontinuity Modeling.....34

Figure 2.15 Flow diagram illustrating factors that must be considered in selecting shear strength.....38

Figure 2.16 Direct Shear Test Results on Massive Limestone, Illustrating the Upper and Lower Limits of the Scattered Data.....39

Figure 2.17 Division of Discontinuities into Categories of Displacement and No Displacement, and With Normal Consolidation (NC) and With Excessive Consolidation (OC) (After Barton 1974).....41

Figure 2.18 Typical in-situ stress-strain graph with variations in Obtainable Modulus.....44

Figure 3.1. Examples of layouts for installing sliding stakes, standpipe piezometers, temperature gauges and joint meters on dam piers.....52

Figure 3.2. Examples of layouts for installing sliding stakes, pneumatic piezometers, temperature gauges, combined meters and sharp threshold measuring instruments on the front view of the dam.....53

Figure 3.3. Example layout for installing sliding stakes, piezometers, temperature gauges, sharp threshold measuring instruments, and joint meters on pots. Spillway Building.....54

Figure 3.4. Example of layout for installing sliding stakes, piezometers, temperature gauges and combined meters on dam cross sections.....55

Figure 3.5. Examples of Types of Open Standpipe Piezometers.....57

Figure 3.6. Example of Piezometer Installation Below Gallery.....58

Figure 3.7a. Schematic of pneumatic piezometer arrangement.....58

Figure 3.7b. Piezometer Arrangement Schematic.....59

Figure 3.7c. Vibrating Wire Piezometer Head (TIP) Details.....59

Figure 3.8. Example of Total Pressure Cell Installation Location.....60

Figure 3.9. Total Pressure Cell Slab Details.....60

Figure 3.10. Types of Standard Sharp Threshold Discharge Measuring Instruments.....61

Figure 3.11 Example of Layout for Installing a Seepage Discharge Measuring Instrument in a Gallery.....63

Figure 3.12. Example of Layout for Installing a Temperature Measuring Device.....64

Figure 3.13. Example of Triangulation Network Layout for Deformation Monitoring.....65

Figure 3.14. Examples of Bukit Tumpuan Shear Stake (AM), Dam Peak Shear Stake (CM) and Reference Bench Mark (BM) Stake.....66

Figure 3.15. Examples of Installation of Hanging Pendulums and Floating Pendulums.....68

Figure 3.16. Details of the Hanging Pendulum Arrangement.....68

Figure 3.17. Details of the Floating Pendulum Arrangement.....68

Figure 3.18. Example of an Inclinerometer Shell, Principles of Measurement and Plotting Conversion of Measurement Results.....69

Figure 3.19. Servo Accelerometer on an Electric Tiltmeter.....70

Figure 3.20. Example of Inclinerometer and Tiltmeter Installation.....70

Figure 3.21A. Reference Rod Group on Mercu Dam and Gallery for Monitoring Construction Connections.....72

Figure 3.21B. Wire Rod Type Crack Gauge.....73

Figure 3.21C. Calibrated Crack Monitor Type Crack Gauge.....73

Figure 3.22. Monitoring Concrete Joints/Cracks with a Joint Meter, Portable Measuring Needle System.....73

Figure 3.23. Examples of Joint Meter Installation Locations and Details of Electric Joint Meters.....74

Figure 3.24. Electric Type Surface Extensometer (Joint Meter).....75

Figure 3.25. Example of Strain Gauge Installation Location and Details of Vibrating Wire Type Strain Gauge.....77

LIST OF TABLES

Table 2.1. Summary of Rock Descriptions.....15

Table 2.2. Types of Rock Index Laboratory Tests.....22

Table 2.3. Test to measure the shear strength of rocks.....35

Table 3.1. Example of a list of instruments installed at several BPG dams.....79

Table 3.2. Recommended Minimum Instrumentation.....80

Table 4.1. Shape and Dimensions of Non-Metal Water Blocks.....86

Figure 4.1. Various Types and Shapes of Non-Metal Water Blocks.....84

Figure 4.2. Polyvinyl/Chloride Water Block With Different Dimensions That Can Be Used To Withstand Hydrostatic Pressure Of 300,000 Pa.....84

Figure 4.3. Relationship Between Arithmetic Dimensions and Compressive Height.....85

LIST OF CONTENTS

FOREWORD.....	iv
LIST OF CONTENTS	v
CHAPTER I INTRODUCTION	
1.1. Background	1-1
1.2. UBM Developments	1-2
1.3. Purpose and Objectives.....	1-4
1.4. Scope.....	1-4
1.5. Normative Reference	1-5
1.6. Understanding	1-6
CHAPTER II SURVEY AND INVESTIGATION	
2.1. General.....	II-1
2.2. Topographic Survey	II-2
2.3. Geotechnical Investigation	II-3
2.3.1. Preliminary Investigation.....	II-3
2.3.2. Detailed Investigation	II-4
2.3.3. Construction execution	II-5
2.4. Material Source Investigation	II-5
2.5. Earthquake Studies	II-6
CHAPTER III FOUNDATIONS	
3.1. General.....	III-1
3.2. Criteria	III-1
3.3. Strength	III-2
3.4. Compressibility.....	III-3
3.5. Erodibility	III-4
3.6. Permeability	III-4
CHAPTER IV EXCAVATION AND FOUNDATION REPAIR	
4.1. General.....	IV-1
4.2. Excavation	IV-2
4.3. Foundation Preparation.....	IV-2
4.3.1. Slope Repair	IV-2
4.3.2. Cleaning	IV-3
4.3.3. Surface Repair.....	IV-3
4.4. Plinth Foundation Repair.....	IV-4
4.4.1. General	IV-4
4.4.2. Curtain Grouting and Consolidation.....	IV-5
4.4.2.1. Traditional Method.....	IV-5
4.4.2.2. GIN Method	IV-6
4.4.3. Special Improvements.....	IV-8
4.5. Embankment Foundation Repair.....	IV-8
CHAPTER V PLIN	
5.1. General.....	V-1
5.2. Plinth width.....	V-1

GUIDELINES FOR DESIGN AND CONSTRUCTION OF CONCRETE MEMBRANE STONE FILL DAM

Decision of the Director General of Water Resources

Number: 304/ KPTS / D/2011

Date: 30 September 2011

MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES

5.3.	The thickness of the plinth.....	V-4
5.4.	Downstream face height.....	V-4
5.5.	Dimensions for Soft Rock Conditions.....	V-5
5.6.	Alternative Design Concept for Plinth Width.....	V-5
5.7.	Geometry of Downstream Plinth Structures.....	V-6
5.8.	Plinth Geometry and Alignment.....	V-8
5.9.	Reinforcement and Armature.....	V-12
	5.9.1. Concrete.....	V-12
	5.9.2. Reinforcement.....	V-13
5.10	Connection.....	V-14
	5.10.1 Perimetric Connections.....	V-14
	5.10.2 Transverse Connection.....	V-15
5.11	Water stop.....	V-15
	5.11.1 Material.....	V-15
	5.11.2 Water stop on Perimetric Connections.....	V-16
	5.11.3 Water stop in Transverse Connections.....	V-17
5.12	Plinth Stability.....	V-17

CHAPTER VI FILLING MATERIALS

6.1.	General.....	VI-1
6.2.	Sand and Gravel.....	VI-1
6.3.	Rock.....	VI-1
6.4.	Fill Material Requirements.....	VI-2
	6.4.1. Filters and Transitions.....	VI-2
	6.4.2. Stone Fill.....	VI-3

CHAPTER VII FILL ZONE

7.1.	General.....	VII-1
7.2.	Distribution of Fill Zones.....	VII-1
7.3.	Fill Material Criteria.....	VII-3
	7.3.1. General.....	VII-3
	7.3.2. Zone 1A.....	VII-4
	7.3.3. Zone 1B.....	VII-4
	7.3.4. Zone 2A.....	VII-4
	7.3.5. Zone 2B.....	VII-5
	7.3.6. Zone 3A.....	VII-5
	7.3.7. Zone 3B.....	VII-5
	7.3.8. Zone C3.....	VII-6
	7.3.9. Zones 3D, 3E and so on.....	VII-6
7.4.	Details of the UBM Dam Cross-Section Zone.....	VII-6
	7.4.1. Zone 2A (Filter).....	VII-6
	7.4.2. Zone 2B (Membrane plate support).....	VII-9
	7.4.2.1. Slope protection during construction.....	VII-11
	7.4.2.2. Eliminates adhesion between membrane and curb.....	VII-15
	7.4.3. Zones 3A,3B,3C (dam body).....	VII-19
	7.4.4. 3D Zone (Drainage).....	VII-19

CHAPTER VIII CONCRETE MEMBRANES

8.1.	General.....	VIII-1
8.2.	Behavior of Concrete Membranes.....	VIII-1
8.3.	Concrete Membrane Plate Dimensions.....	VIII-3
	8.3.1. Membrane Thickness.....	VIII-3

8.3.2.	Membrane Plate Width.....	I-5
	Connection.....	VIII-5
8.4.1.	General.....	VIII-5
8.4.2.	Vertical Connection.....	VIII-6
8.4.3.	Horizontal Connection Joints.....	VIII-10
8.4.4.	Perimetric Connections.....	VIII-13
8.5.	Water stop.....	VIII-13
8.6.	Membrane Slab Drainage during Construction.....	VIII-15
8.7.	Concrete.....	VIII-15
	8.7.1. Criteria.....	VIII-15
	8.7.2. Cement Content.....	VIII-16
	8.7.3. Water-Cement Ratio.....	VIII-17
	8.7.4. Concrete Aggregate.....	VIII-17
	8.7.5. Ease of Work.....	VIII-18
	8.7.6. Shrinkage.....	VIII-18
	8.7.7. Treatment (curing).....	VIII-18
	8.7.8. Construction Tolerances.....	VIII-18
8.8.	Reinforcement.....	VIII-19
	8.8.1. Function.....	VIII-19
	8.8.2. Types of Reinforcing Iron.....	VIII-19
	8.8.3. Reinforcement Percentage.....	VIII-19
	8.8.4. Reinforcement Spacing and Concrete Covers.....	VIII-20
	8.8.5. Anti-Spalling Reinforcement.....	VIII-21
	8.8.6. Fiber Reinforcement.....	VIII-21
	8.8.7. Special Reinforcement.....	VIII-22
8.9.	Membrane Plate Cracks.....	VIII-22
	8.9.1. Consequences of Decline.....	VIII-22
	8.9.2. Shrinkage.....	VIII-23
	8.9.3. Corrective Action.....	VIII-23
8.10	Membrane Plate Attachment to Curb.....	VIII-23

CHAPTER IX PERIMETRIC JOINTS

9.1.	General.....	IX-1
9.2.	Perimetric Joint Design.....	IX-4
	9.2.1. General.....	IX-4
	9.2.2. Design for a Low UBM Dam.....	IX-5
	9.2.3. Design for a Very High UBM Dam.....	IX-6
9.3.	Water stop.....	IX-7
	9.3.1. Lower Water stop.....	IX-7
	9.3.1.1. Metal Water stop.....	IX-8
	9.3.1.2. PVC water stop.....	IX-9
	9.3.1.3. Lower water stop During Construction.....	IX-10
	9.3.2. Central water stop.....	IX-10
	9.3.3. Upper water stop.....	IX-12
	9.3.3.1. General.....	IX-12
	9.3.3.2. Mastic Sealant (Sealant).....	IX-12
	9.3.3.3. Non-Cohesive Soft Material Seal.....	IX-14
	9.3.3.4. Another Upper Water Retainer.....	IX-15
9.4.	Etc.....	IX-15

CHAPTER X CREST DAM

10.1	General.....	X-1
------	--------------	-----

10.2	Peak Width.....	X-1
10.3	Extra Fill (Camber).....	X-3
10.4	Peak Care and Elevation.....	X-4
10.5	Parapet.....	X-5
	10.5.1 Wall Height.....	X-5
	10.5.2 Wall Connections with Membranes.....	X-5
	10.5.3 Transverse Connection.....	X-8
	10.5.4 Focus Details.....	X-8

CHAPTER XI INSTRUMENTATION

11.1	General.....	XI-1
11.2	Limitation.....	XI-2
11.3	Instrumentation Systems.....	XI-2
	11.3.1 Piezometer.....	XI-3
	11.3.2 Seepage Measuring Equipment.....	XI-3
	11.3.3 Decline Cell.....	XI-4
	11.3.4 Electro-levels.....	XI-4
	11.3.5 Jointmeters.....	XI-5
	11.3.6 Earthquake Measuring Instrument (Accelerometer).....	XI-6
11.4	Monitoring.....	XI-6

CHAPTER XII DESIGN ANALYSIS

12.1	General.....	XII-1
12.2	Design Considerations.....	XII-1
12.3	Static Stability Analysis.....	XII-2
	12.3.1 Shear Strength of Rock Fill.....	XII-2
	12.3.2 Stability Analysis of Infinite Slopes.....	XII-3
	12.3.3 Boundary Equilibrium Stability Analysis.....	XII-3
12.4	Dynamic Stability Analysis.....	XII-4
	12.4.1 Performance of the Batu Embankment Dam during an Earthquake.....	XII-4
	12.4.2 High UBM Dam Performance > 200 m.....	XII-6
	12.4.3 The influence of the earthquake on backfill and drainage materials.....	XII-5
12.5	Deformation of the Upstream Membrane Plate.....	XII-11
12.6	Seepage Through Foundations and Upstream Membranes.....	XII-13
	12.6.1 General.....	XII-13
	12.6.2 Flow Through Cracks.....	XII-13

CHAPTER XIII CONSTRUCTION IMPLEMENTATION

13.1	Planning.....	XIII-1
13.2	Construction considerations and implementation schedule.....	XIII-1
13.3	Construction Stages.....	XIII-3
13.4	Implementation of Plinth Construction.....	XIII-4
13.5	Grouting.....	XIII-5
13.6	Stockpiling of Rock Fill and Transition Materials.....	XIII-5
13.7	Membrane Plate Concrete Casting.....	XIII-7
	13.7.1 General.....	XIII-7
	13.7.2 Sliding Scaffolding.....	XIII-7
	13.7.3 Side Scaffolding.....	XIII-10

CHAPTER XIV PERFORMANCE OF THE UBM DAM

14.1	General.....	XIV-1
14.2	Performance assessment.....	XIV-1

14.3	Acceptable Performance.....	V-1
	14.3.1 Seepage.....	XIV-1
	14.3.2 Dam Deformation.....	XIV-2
	14.3.3 Foundation and Embankment Stability.....	XIV-2
14.4	Performance Prediction.....	XIV-2
	14.4.1 Seepage.....	XIV-2
	14.4.2 Deformation.....	XIV-2
	14.4.3 Fill and Foundation Stability.....	XIV-3
14.5	Performance Measurement.....	XIV-3
	14.5.1 Seepage.....	XIV-3
	14.5.2 Fill Instrumentation.....	XIV-3
	14.5.3 Membrane Plate Instrumentation.....	XIV-4
	14.5.4 Monitoring and Data Collection.....	XIV-5
	14.5.5 Instrument Reading Frequency.....	XIV-6
	14.5.6 Damage and Repair.....	XIV-6

BIBLIOGRAPHY

APPENDIX A Examples of Domestic Cases

APPENDIX B Examples of Cases Abroad

LIST OF TABLES

Table 3.1 Whole Rock Classification from Deere and Miller's (1969).....	I-2
Table 3.2 RQD Criteria and Rock Quality.....	III-3
Table 3.3 Permeability Classification.....	III-4
Table 4.1 Basic grout mixes, grouting pressures, GIN curves and take-up limits.....	IV-7
Table 5.1 Permissible hydraulic gradients.....	V-5
Table 5.2 Relationship between RMR and plinth design index.....	V-6
Table 5.3 Stability and stress criteria.....	V-20
Table 6.1 Strength of Intact Rock according to Deere and Miller's (1969).....	VI-3
Table 7.1 Criteria for embankment material.....	VII-3
Table 7.2 Filter criteria (USBR, 1987).....	VII-8
Table 7.3 Limits of D10f and D90f (filter) to prevent segregation.....	VII-9
Table 7.4 Gradation boundaries, modification of ICOLD Bulletin 70 for zone 2B.....	VII-10
Table 8.1 Thickness of UBM dam concrete membrane (ICOLD, Bulletin, 2005).....	VIII-4
Table 9.1 Perimeter joint movements.....	IX-3
Table 10.1 Types of instruments and parameters measured.....	X-3
Table 12.1 Deformation of rockfill dams due to earthquake effects.....	XII-4
Table 12.2 Drop distribution factors.....	XII-10
Table 12.3 Estimated flow rates through cracks.....	XII-14

**GUIDELINES FOR DESIGN AND CONSTRUCTION
OF CONCRETE MEMBRANE STONE FILL DAM**

Decision of the Director General of Water Resources

Number: 304/ KPTS / D/ 2011

Date: 30 September 2011

**MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF WATER RESOURCES**

LIST OF CONTENTS
APPENDIX A

FOREWORD	iv
LIST OF CONTENTS	v
CHAPTER I INTRODUCTION	
1.1. Background	A-1
1.2. History and Chronology of Development.....	A-1
1.3. Technical Data	A-6
1.4. Seepage/Leaks	A-7
CHAPTER II BATUBESIDAM	
2.1. General.....	A-9
2.2. Technical Data	A-11
2.3. Instrumentation	A-13
2.4. Dam Geology	A-13
2.5. Backfill Material	A-17
2.6. Material Source.....	A-19
2.6.1. Quarry I (Limestone).....	A-19
2.6.2. Quarry II (Peridotite)	A-19
2.6.3. Quarry III (Peridotite).....	A-20
2.6.4. Zone I Materials	A-20
2.6.5. Soil Parameters	A-20
CHAPTER III CIRATA DAM	
3.1. General.....	A-23
3.2. Technical Data	A-24
3.3. Geological Conditions	A-27
3.4. Dam Performance	A-28
CHAPTER IV PONRE-PONRE DAM	
4.1. General.....	A-29
4.2. Technical Data	A-30
4.3. Dam Geology	A-30
4.4. Distribution of Fill Zones	A-33
4.5. Plin	A-34
4.6. Upstream Membrane Plate.....	A-35
CHAPTER V CONCLUSIONS AND RECOMMENDATIONS	
5.1. Conclusion	A-37
5.2. Suggestion.....	A-38

**GUIDELINES FOR DESIGN AND CONSTRUCTION
OF CONCRETE MEMBRANE STONE FILL DAM**

Decision of the Director General of Water Resources

Number: 304/ KPTS / D/ 2011

Date: 30 September 2011

MINISTRY OF PUBLIC WORKS

DIRECTORATE GENERAL OF WATER RESOURCES

LIST OF CONTENTS
APPENDIX B

8.3. Perimetric Joint Movement.....	B-43
8.4. Post-Construction Dam Peak Reduction.....	B-44
8.5. Seepage and Repair.....	B-45
8.6. UBM Dam seepage in Tasmania.....	B-46
8.7. Seepage from UBM Dam in China.....	B-49

FOREWORD.....	iv
LIST OF CONTENTS	v

CHAPTER I FOUNDATION REPAIR

1.1. GIN Method of Grouting.....	B-1
1.2. Alluvial Foundation and Soft Soil.....	B-3
1.2.1. Salvajina Dam, Columbia, 1983.....	B-3
1.2.2. Sugarloaf Dam, Australia, 1979.....	B-7
1.2.3. Mohale Dam, Lesotho, 2001.....	B-8
1.2.4. Puclaro Dam, 2000 and Santa Juana Dam, 1995, Chile.....	B-9
1.2.5. Pichi-Picun-Leufu Dam, Argentina, 1999.....	B-10
1.2.6. Khao Laem Dam, Thailand, 1985.....	B-11

CHAPTER II PLIN

2.1. General.....	B-12
2.2. Shiroro Dam.....	B-14

CHAPTER III FILL ZONE

3.1. Aquamilpa Dam.....	B-15
3.2. Xingo Dam.....	B-15
3.3. Tianshengqiao Dam.....	B-16
3.4. Keenleyside Dam.....	B-17

CHAPTER IV MEMBRANE PLATES

4.1. General.....	B-21
4.2. Cracks in the membrane layer.....	B-22
4.3. Type of crack in the membrane layer.....	B-23
4.4. Control of membrane plate cracks.....	B-24

CHAPTER V PARAPET

5.1. Kangaroo Creek Dam, Australia.....	B-26
5.2. Golillas Dam, Columbia.....	B-27
5.3. Salvajina Dam, Columbia.....	B-28
5.4. Aquamilpa Dam, Mexico.....	B-29
5.5. El Pescador Dam, Columbia.....	B-29

CHAPTER VI INSTRUMENTATION

6.1. Tianshengqiao Dam 1 (TSQ 1).....	B-30
6.2. Aquamilpa Dam.....	B-32

CHAPTER VII EARTHQUAKE AND SUBSTANCE

7.1. Performance of the Batu Embankment Dam during an Earthquake.....	B-30
7.2. Decline.....	B-32

CHAPTER VIII PERFORMANCE

8.1. The UBM Dam that has been built.....	B-41
8.2. Deformation Modulus.....	B-41

CHAPTER IX CONCLUSION

Conclusion	B-50
------------------	------

LIST OF CONTENTS

LIST OF CONTENTS	i
LIST OF TABLES	vi
LIST OF FIGURES	vii

CHAPTER I INTRODUCTION

1.1. Background	I-2
1.2. Purpose and Objectives.....	I-2
1.2.1. Meaning	I-2
1.2.2. Objective	I-2
1.3. Scope of Guidelines	I-2
1.4. Normative Reference	I-2
1.5. Understanding	I-3

CHAPTER II OVERVIEW OF RISK ASSESSMENT

2.1. General.....	II-1
2.2. Elements in the Risk Assessment Process	II-4
2.3. Risk Assessment Concept and Process.....	II-5
2.4. General Views Regarding Traditional Methods and Risk Assessment	II-7
2.5. Difference Between Traditional Approaches and Risk Assessment	II-8
2.6. Benefits and Limitations of Risk Assessment	II-9
2.6.1. Benefits of Risk Assessment.....	II-9
2.6.2. Limitations of Risk Assessment.....	II-11
2.7. Type and Level of Risk Assessment.....	II-13
2.7.1. Risk Assessment Type	II-13
2.7.2. Risk Assessment Levels.....	II-17

MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES

CHAPTER III RISK ASSESSMENT APPLICATION

3.1. Introduction.....	III-1
3.2. Risk Assessment at the Feasibility Study Stage	III-1
3.3. Risk Assessment At The Detailed Design Stage	III-2
3.4. Risk Assessment at the Management Stage (Dam Operation and Maintenance).....	III-2
3.5. Risk Assessment at the Dam Removal Stage	III-3
3.6. Dam Risk Assessment Frequency.....	III-3

CHAPTER IV PREPARATION OF RISK ASSESSMENTS

4.1. Risk Assessment Planning	IV-1
4.1.1. Determining the Objectives of the Risk Assessment Study.....	IV-1
4.1.2. Determining the Type, Level and Stage of Risk Assessment	IV-5
4.1.3. Risk Assessment Study Process	IV-6
4.1.4. Risk Assessment Portfolio	IV-6
4.1.5. Consider a Phased Approach to Risk Assessment.....	IV-13
4.1.6. Key Personnel in Risk Assessment Studies	IV-14
4.1.7. Risk Assessment Study Report	IV-15
4.2. Data Collection	IV-16
4.2.1. Collection of Relevant Data	IV-16
4.2.2. Determination of the System to be Analyzed and Important Events that Impact Risk	IV-16
4.3. Inspection of Dams and Flooding Areas.....	IV-17

4.3.1. Formation of Inspection Team and Inspection Preparation.....	V-17
4.3.2. Inspection of Dams and Flooding Areas.....	IV-18
CHAPTER V RISK ANALYSIS	
5.1. Identify Dam Hazards.....	V-1
5.2. Dam Failure Model Analysis.....	V-2
5.2.1. Identification of Dam Failure Models to be Analyzed.....	V-2
5.2.2. Identify Types of Dam Failures Analyzed.....	V-4
5.3. Determination of Loading Status, Scenarios and Opportunities.....	V-4
5.4. Estimated Probability of Failure.....	V-7
5.4.1. Determination of Dam Failure Mechanisms.....	V-7
5.4.2. Estimated Possibility or Probability of Dam Failure.....	V-8
5.4.3. Combine the Annual Probability of Dam Failure to Get the Overall Annual Probability of Failure.....	V-22
5.4.4. Uncertainty Estimation of Dam Failure Probability Using Sensitivity Analysis.....	V-28
5.5. Estimated Consequences of Dam Failure.....	V-28
5.5.1. Identify dam failure scenarios.....	V-28
5.5.2. Estimated Characteristics of Inundation Downstream of the Dam.....	V-28
5.5.3. Determination of Consequence Assessments in Downstream Areas.....	V-29
5.5.4. Estimated Life Safety Consequences.....	V-29
5.5.5. Estimated Consequences of Economic and Financial Loss (Monetary Loss).....	V-32
5.5.6. Estimated Incommensurable Consequences.....	V-33
5.5.7. Estimated Intangible Consequences.....	V-33
5.5.8. Estimating Consequence Uncertainty With Sensitivity Analysis.....	V-34
5.6. Risk Estimates.....	V-34
5.6.1. Life Risk Report.....	V-34
5.6.2. Economic and Financial Loss Risk Report.....	V-35
5.6.3. Non-Assessable Risk Report.....	V-35
5.6.4. Intangible Risk Report.....	V-36
5.6.5. Risk Uncertainty and Sensitivity Report.....	V-36
5.6.6. Preparation of Risk Summary.....	V-38

CHAPTER VI RISK EVALUATION

6.1. Determination of Tolerated Risk Policies and Criteria.....	VI-1
6.2. Comparison of Risk with Tolerable Risk Criteria.....	VI-6
6.2.1. Comparison of Life Safety Risks with Policies and Criteria Set by Dam Owners.....	VI-6
6.2.2. Comparison of the Risk of Economic and Financial Losses with the Policies and Criteria Set by the Dam Owner.....	VI-6
6.2.3. Comparison of Non-Assessable and Intangible Risks with Tolerated Risk Policies.....	VI-6
6.2.4. Determining Whether the Risk is Tolerable.....	VI-7

CHAPTER VII RISK REDUCTION AND RISK MANAGEMENT

7.1. Risk Reduction Options.....	VII-1
7.1.1. Identification and Description of Risk Reduction Options.....	VII-1
7.1.2. Estimated Treatment Required in Implementing Risk Reduction Options.....	VII-2
7.2. Determination of Whether Risk is Tolerable After Risk Reduction.....	VII-2

7.3. Selection of Risk Reduction Options and Appropriate Implementation Strategies.....	I-3
7.3.1. Selection of Appropriate Risk Reduction Options.....	VII-3
7.3.2. Selection of Appropriate Programs and Implementation Strategies.....	VII-4
7.4. Proper Implementation of Risk Reduction Options and Strategies.....	VII-5
7.5. Risk management.....	VII-6

BIBLIOGRAPHY

LIST OF TABLES

Table 2.1. Qualitative Likelihood Values for Risk Assessment.....	II-15
Table 2.2. Qualitative Value of Consequences (Impact) for Risk Assessment.....	II-15
Table 2.3. Relationship between Equality of Consequences for Dam Downstream Areas and Hazard Classification.....	II-15
Table 2.4. Risk Value Matrix.....	II-16
Table 2.5. Risk Criteria Matrix.....	II-16
Table 2.6. Risk Assessment Levels.....	II-18
Table 2.7. Engineering Input Levels for Risk Assessment.....	II-19
Table 2.8. Levels of Consequence Assessment for Risk Assessment.....	II-21
Table 2.9. Risk Evaluation Methods.....	II-22
Table 5.1. Probability Mapping Scheme (Barneich et al, 1996).....	V-13
Table 5.2. Example of a Method for Estimating the Probability of Failure - Embankment Dam.....	V-18
Table 5.3. Example of a Method for Estimating the Probability of Failure - Concrete Membrane Rock Fill Dam.....	V-24
Table 5.4. Example of a Method for Estimating the Probability of Failure - Concrete and Masonry Dams.....	V-26

LIST OF FIGURES

Figure 2.1 Risk Assessment in the Risk Management Process.....	II-1
Figure 2.2 Risk Assessment Process in the Risk Management Model (According to JCG).....	II-3
Figure 2.3 Elements of the Risk Assessment Process.....	II-6
Figure 4.1 Typical Risk Assessment Process for Dams.....	IV-9
Figure 4.2 Typical Risk Assessment Portfolio Process for Dams.....	IV-10
Figure 4.3 Risk Assessment and Traditional Standards-Based Approach.....	IV-11
Figure 4.4 Overview of Inputs, Targets and Integration of Risk Assessment Portfolio Results into Dam Safety Programs and Dam Owner Business Processes.....	IV-12
Figure 5.1 IDiagram of Failure Mechanisms and Precautions.....	V-7
Figure 5.2 Example of Quantitative Estimation in Event Tree Analysis.....	V-8
Figure 6.1 Recommended Social Risk Criteria for Existing Dams (Old Dams).....	VI-4
Figure 6.2 Recommended Social Risk Criteria for New Dams and Old Dams with Dam Raising.....	VI-5

APPENDIX LIST

- APPENDIX A : Watch List for Risk Assessment Study Report
- APPENDIX B : Example of a Checklist for Dam Inspection
- APPENDIX C : Example of Failure Model Analysis and Explanation
- APPENDIX D : Example of Division of Various Loading Domains
- APPENDIX E : Examples of Event Trees and Fault Trees
- APPENDIX F : Notes for Estimating the Reliability of the Overflow Gate
- APPENDIX G : Example of Calculating the Overall Dam Failure Probability
- APPENDIX H : Life Security Risk Calculations and Reports
- APPENDIX I : Non-Assessable Risk and Intangible Risk Report
- APPENDIX J : Examples of Risk Assessment Applications for Several Dams in Indonesia

Dam Risk Assessment

MINISTRY OF PUBLIC WORKS

DIRECTORATE GENERAL OF WATER RESOURCES

LIST OF CONTENTS

LIST OF CONTENTS.....	i
LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii

CHAPTER I INTRODUCTION

1.1. Background.....	1
1.2. Purpose and Objectives.....	1
1.3. Scope.....	1
1.4. Understanding.....	2
1.5. Normative Reference.....	4

CHAPTER II THE FORMATION OF SOFT SOIL

2.1. General.....	5
2.2. Tunnel selection basis.....	6
2.2.1. Principle of Work Sequence for Dam Implementation.....	6
2.2.2. Dam Complementary and Supporting Buildings.....	6
2.2.3. Flowing or non-flowing buildings.....	12
2.2.4. Selection of Excavation Methods Based on Geological Conditions.....	12
2.3. Tunnel Shape Selection.....	13
2.3.1. Functions and Benefits of Tunnels.....	13
2.3.2. Geological and Geohydrological Conditions.....	15
2.3.3. Competence and Convergence of Rock Masses.....	17
2.3.3.1. Conventional tunnel shape.....	17
2.3.3.2. Unconventional tunnel shape.....	17
2.3.4. Tunnel construction methods.....	19
2.3.4.1. Conventional method.....	19
2.3.4.2. Non-conventional methods.....	19
2.3.4.3. Tunneling Failure Modes and Tunnel Damage.....	19
2.4. Selection of Tunnel Dimensions.....	22
2.4.1. Tunnel dimension requirements.....	22
2.4.2. Consideration of Tunnel Dimension Selection.....	22

CHAPTER III TUNNEL MEASUREMENT

3.1. Introduction.....	24
3.2. Basic Frame Gauge.....	24
3.2.1. National Basic Framework System.....	24
3.2.2. Basic Framework System for Measurements in Dams.....	27
3.2.2.1. Triangular Network Method.....	28
3.2.2.2. Traverse Method.....	30
3.2.2.3. Other Special Methods.....	32
3.3. Tunnel Measurements in Dams.....	33
3.3.1. Tunnel Routes in General.....	33
3.3.2. Topographical Work Criteria for Tunnel Planning.....	34
3.4. Measurements in Tunnel Implementation.....	36
3.4.1. Stages of Work.....	36
3.4.2. Determination of Tunnel Axis Lines.....	36
3.4.3. Straight Tunnel Measurement.....	36
3.4.4. Curved Tunnel Measurements.....	38
3.5. Tying Axis Lines on the Surface into Tunnel Routes.....	39

GUIDELINES FOR PLANNING AND IMPLEMENTING TUNNEL CONSTRUCTION FOR DAM

The decision of the Director General of Resources, Ari

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MINISTRY OF PUBLIC WORKS DIRECTORATE GENERAL OF WATER RESOURCES

3.6.	Precise Measurements in Long Tunnels.....	40
3.6.1.	Horizontal Layout.....	40
3.6.2.	Vertical Layout or Elevation of Long Tunnels.....	42
3.6.3.	Application of Laser Technology.....	43
3.7.	Moving the Reference Point into the Tunnel via Shaft.....	44
3.7.1.	Well Structure (shaft).....	44
3.7.2.	Moving the Reference Point into the Tunnel.....	44
CHAPTER IV GEOLOGY		
4.1.	General.....	33
4.2.	Earthquake Source Characterization.....	33
4.2.1.	View.....	33
4.2.2.	Earthquake Source Characterization Methods.....	34
4.2.3.	Determination of potential fault movements.....	35
4.3.	Determination of Design Intensity of Surface Earthquake Shocks.....	36
4.3.1.	Introduction.....	36
4.3.2.	Deterministic approach.....	36
4.3.3.	Probabilistic approach.....	39
4.3.4.	Approach with a map of Indonesia's earthquake zones.....	41
4.3.4.1.	Subduction earthquake data collection.....	41
4.3.4.2.	The earthquake source area originates from the re-movement of active faults.....	47
4.3.4.3.	Earthquake zone map.....	48
4.3.4.4.	Steps for using the Indonesian Earthquake Zone Map.....	51
CHAPTER V TUNNEL DESIGN		
5.1.	Essential Characterization of Surface Earthquake Shocks.....	54
5.2.	Peak Values.....	54
5.2.1.	Evaluation of Peak Parameters.....	54
5.2.2.	Peak values attenuation function.....	55
5.2.3.	Selection of attenuation function.....	58
5.2.4.	Selection of input (input) parameters of the attenuation function.....	59
5.2.5.	Distribution of output (output) parameter values for surface earthquake shaking.....	59
5.3.	Frequency Level.....	59
5.4.	Energy Amount.....	59
5.5.	Duration.....	61
5.6.	Influence: Local Field Conditions.....	66
5.7.	Selection of Representative Time History.....	69

CHAPTER VI METHODOLOGY FOR IMPLEMENTING TUNNEL CONSTRUCTION		
6.1.	General Explanation.....	71
6.2.	Subsurface Profile Development.....	72
6.2.1.	General.....	72
6.2.2.	Water face.....	72
6.2.3.	Soil stratigraphy.....	73
6.2.4.	Depth of bedrock.....	73
6.3.	Required Soil Parameters.....	74
6.3.1.	General.....	74
6.3.2.	Relative density.....	74
6.3.3.	Shear wave speed.....	75
6.3.4.	Cyclic stress-strain properties.....	75
6.3.5.	Peak and residual shear strength.....	77
6.4.	Evaluation of Soil Properties.....	78

6.4.1.	General.....	78
6.4.2.	Field testing for soil profile.....	78
6.4.2.1.	Standard penetration test (SPT).....	78
6.4.2.2.	Konus penetration test (CPT).....	79
6.4.3.	Soil density.....	81
6.4.4.	Shear wave speed.....	81
6.4.4.1.	General.....	81
6.4.4.2.	Geophysical survey.....	81
6.4.4.3.	Pressure wave speed.....	84
6.4.5.	Evaluation of cyclic stress-strain parameters.....	84
6.4.5.1.	Laboratory test.....	84
6.4.5.2.	Use of Empirical Correlation.....	85
6.4.5.3.	Peak and residual shear strength.....	89
CHAPTER VII INSTRUMENTATION AND MONITORING		
7.1.	General.....	91
7.2.	Dynamic Response Analysis of Special Local Conditions (site-specific site response analysis).....	91
7.3.	Response Simplification Analysis, Dynamic.....	93
7.4.	Equivalent Linear One-Dimensional Dynamic Response Analysis.....	100
7.5.	One and Two-Dimensional Dynamic Response Analysis.....	103
7.5.1.	General.....	103
7.5.2.	Nonlinear one-dimensional dynamic response analysis.....	103
7.5.3.	Two-dimensional dynamic response analysis.....	104
CHAPTER VIII OTHER SUPPORTING FACILITIES		
8.1.	Background.....	106
8.2.	Earthquake Coefficient Analysis.....	107
8.2.1.	General.....	107
8.2.2.	Selection of earthquake coefficients.....	109
8.2.2.1.	Method based on experience.....	109
8.2.2.2.	Probabilistic method.....	110
8.3.	Analysis of Permanent Diversion Due to Earthquakes from Newmark.....	115
8.4.	Unification Methodology (Unified Methodology) for Analysis of Stability and Transfer (Deformation) Due to Earthquakes.....	117
8.5.	Additional Considerations.....	119
BIBLIOGRAPHY..... 188-191		
APPENDIX BOOK (SEPARATE)		

LIST OF TABLES

Table 1	Classification of Rock Loads for Tunnel Planning and Implementation, Terzaghi, 1946 modified, 1970.....	18
Table 2	Requirements for Topographic Maps for Dams.....	25Ta
Table 3	Observation Methods & Limitation of Errors in Measurements.....	29Ta
Table 4	Types of tests and standards used.....	57

Table 5 Qualitative Relationship of Geological Assessment, Safety Figures and Costs.....	61
Table 6 Relationship between Ko values and tangential Stress.....	76
Table 7 Classification of in situ rocks and support estimates according to Terzaghi, 1946.....	82
Table 8 Rock Mass Load on Tunnel Roof (Terzaghi, 1946).....	84
Table 9 Main Factors in Selection of Support Components.....	100
Table 10 Steel Material Parameters for Steel Rib.....	102
Table 11 Effect of Using Rock Anchors.....	105
Table 12 Physical Properties of Rock Bolts (attachment type and expansion type).....	106
Table 13 Effect of Using Shotcrete.....	114
Table 14 Reference for Concrete Mix Design for Saguling Dam.....	123
Table 15 Problems that may arise with the Portal and Design Considerations.....	125
Table 16 Types and Properties of Transport Tunnel Portals in Japan.....	127
Table 17 Classification of Tunnels According to Mass Load of Rock/Soil on the Roof, Type of Rock/Soil & Excavation Method.....	142
Table 18 Soil Classification for Tunnels according to Terzaghi, 1950 & Applications.....	165
Table 19 Convergence Measurement Distance and Tunnel Top Descent.....	176
Table 20 Main Points of Observations and Measurements in Tunnels and Surrounding Land.....	178
Table 21 Frequency of Convergence/Tunnel Peak Lowering Measurements.....	180

LIST OF FIGURES

Figure 1 Tunnels in dams according to their function.....	12
Figure 2 (a) Karangates Dam situation.....	13
Figure 2 (b) Typical Cross Section.....	14
Figure 3 Principle of Work Sequence for Implementing an Embankment Type Dam.....	15
Figure 4 River morphology.....	16
Figure 5 River Morphology & Geology Considerations for Selection of Tunnels as River Avoidance Buildings.....	16
Figure 6 River Morphology & Geology Considerations for Selection of Tunnels as Dam Spillway Buildings.....	20
Figure 7 Relationship between tunnels and open excavations from a geological aspect (Legget, 1988).....	22
Figure 8 Bedding Slope Affects Open Excavation.....	26
Figure 9 Typical cross-sectional shape of a tunnel.....	28
Figure 10 The tunnel route is parallel to the rock bedding.....	30
Figure 11 Tunnel route perpendicular to rock bedding.....	31
Figure 12 Tunnel route through the Anticlinal.....	37
Figure 13 Tunnel route through Sinklinas.....	38
Figure 14 Several examples of discontinuities that affect Tunnel stability (Proctor & White, 1946).....	20
Figure 15 Some examples: discontinuities affecting tunnel stability (Proctor & White, 1946).....	22
Figure 16 Flat rectangular coordinate system in Indonesia.....	26
Figure 17 The ABC triangular mesh and its development on a covered site.....	28
Figure 18 Traverse method with open polygons.....	30
Figure 19 Traverse method with closed polygons.....	31
Figure 20 Straight tunnel measurements (a) and cross-sectional plan (b) of the tunnel.....	37
Figure 21 Curved tunnel measurements.....	38

Figure 22 Curved tunnel layout (curve) with deflection angles.....	41
Figure 23 Layout of horizontal reference points for directional transfer into tunnel.....	45
Figure 24 Rock mass and intact rock.....	62
Figure 25 Longitudinal geological cross-section of the Jatigede Dam bypass tunnel.....	65
Figure 26 Longitudinal cross-section of a tunnel through a mountain with rock weathering zones.....	66
Figure 27 Confinement criteria according to Snowy Mountains - Power Project.....	77
Figure 28 Criteria for restraint in Norway.....	72
Figure 29 Stress behavior at tunnel openings under elastic-plastic conditions.....	74
Figure 30 Changes in horizontal and vertical forces according to tunnel depth.....	77
Figure 31 Sketch of the mechanical process and sequence of collapse around the cavity by stress rearrangement pressure.....	78
Figure 32 Schematic representation of stress around a circular cavity with hydrostatic pressure.....	79
Figure 33 Loading pattern on sand model tunnel supports.....	81
Figure 34 Underground arcing action.....	83
Figure 35 Overbreak (excess digging) in figure (a) and popping.....	86
Figure 36 Grouping of rock properties according to Bieniawski, 1976.....	88
Figure 37 Relationship between RQD, tunnel width and support Requirements.....	89
Figure 38 Relationship between fracture spacing and rock strength and excavation methods.....	90
Figure 39 Geomechanical classification of rock masses for tunneling purposes.....	91
Figure 40 Types of Steel Support Shapes.....	101
Figure 41 Connection types and shoe plates.....	103
Figure 42 Tie beam stirrups.....	103
Figure 43 Typical arrangement of anchors in a longitudinal section of a tunnel shaft.....	105
Figure 44 Rock anchor in detail.....	107
Figure 45 Rock/lamina layers in suspended form.....	108
Figure 46 The rock/lamina layer acts as a beam clamped at both ends.....	110
Figure 47 Radial force sr.....	111
Figure 48 Hypothetical arc in rock with cracks produced by rock anchors.....	111
Figure 49 Rock anchor rods and supporting lifting forces with anchorage.....	112
Figure 50 Anchorage on fault.....	113
Figure 51 Shape of tunnel walls.....	116
Figure 52 Cross-section of a monolithic rigid tunnel without elastic subgrade reaction.....	118
Figure 53 Detailed cross-section supported by sand soil pressure.....	119
Figure 54 Load on tunnel cross-section with lateral bearing support and assumed elastic deformation and subgrade action.....	119
Figure 55 Typical cross-section of the Wadaslantang Dam bypass tunnel for STA 0+112.00 from the portal at STA 080.00 (EE cross-section).....	121
Figure 56 Typical cross-section of the Wadaslantang Dam circumvention tunnel in the portal section (STA 080.00) and enlargement of the D-D section in front of STA +112.00.....	121
Figure 57 Standard tunnel portal zone.....	124
Figure 58 Portal excavation and support system in the H-3 Oahu tunnel, Hawaii.....	128
Figure 59 Typical drilling in the tunnel roof at the portal section.....	129
Figure 60 Typical grouting for a tunnel roof in the portal section.....	130
Figure 61 Types of rock arcing and rock stress in tunnels.....	131
Figure 62 Stress from a vertical well.....	131

Figure 63 Tensions in a sloping well roof.....	131
Figure 64 Davis Bridge Dam spillway in the United States.....	134
Figure 65 Comparison between standard type well spillway and flat crested.....	135
Figure 66 Work sequence flow chart in tunnel construction.....	137
Figure 67 Relationship between time, overbreak and rock load in lumpy and interbedded rocks.....	138
Figure 68 Acreing period and excavation sequence	
Figure 69 Operation cycle chart for one rotation.....	138
Figure 70 Rock pressure development with the Belgian method for slow and fast progress in the construction phase.....	139
Figure 71 Relationship between time, overbreak and rock load according to Terzaghi.....	139
Figure 72 Step method (bench method) in rock tunnel excavation.....	145
Figure 73 Hallway method (drift method).....	145
Figure 74 Formation of the blast cone.....	147
Figure 75 Principle & pattern of a shot delay blasting.....	148
Figure 76 Explosion hole ignition pattern.....	148
Figure 77 Burn cut pattern, consisting of box cuts and line cuts.....	149
Figure 78 Angle cut pattern, consisting of a) Pyramid, b) Triple and c) Draw.....	149
Figure 79 Excavation variations on the final horseshoe shape for a large tunnel.....	153
Figure 80 Comparison between wooden and steel supports.....	154
Figure 81 Comparison between wood-steel combination supports and roof bolting anchors.....	155
Figure 82 Working principle of roof bolt anchors (roof bolting) according to Rabcewicz.....	156
Figure 83 Anchor spacing for flat roofs.....	156
Figure 84 Natural rock arches/rolags by roof anchors/bolts.....	156
Figure 85 Tunnel with wooden supports.....	157
Figure 86 Wooden supports with wall reinforcement (skeleton lagging).....	157
Figure 87 Initial excavation (drift) with foreboding.....	167
Figure 88 Various variations of foreboding methods with wooden scaffolding.....	167
Figure 89 Flowchart of objectives and rules for tunnel observation and monitoring.....	175
Figure 90 Relationship between the position of the excavation working surface and the soil properties around the tunnel.....	177
Figure 91 Measuring points on the surface correspond to the relationship between the area affected by the excavation and the position of the working surface.....	181
Figure 92 Example of setting up a settlement measurement point for the top of a convergent tunnel.....	181
Figure 93 Example of measuring instrument setup.....	181
Figure 94 Measurement of land subsidence from the ground surface and setting of land subsidence measurement points.....	182
Figure 95 Hazard rating from periods of being in an atmosphere polluted with CO (monoxide) gas.....	185
Figure 96 Ventilation method by blowing and exhausting.....	186
Figure 97 Tunnel with multiple ventilation systems.....	187

SNI

Indonesian National Standards

Procedure for calculating planned flood discharge

SNI 2415:2016

National Standardization Boards (BSN)

Appendix F (informative) Reference B- Flood discharge calculation method requiring further testing.....	71
Appendix G (informative) Reference C - Example of calculating flood discharge using a method that requires further study.....	75
Bibliography.....	79

LIST OF CONTENTS

List of contents.....	i
List of Figure.....	iii
List of Table.....	iv
Foreword.....	v
Introduction.....	vi
1. Scope.....	1
2. Normative reference.....	1
3. Terms and definitions.....	1
4. Terms and conditions.....	4
4.1. Provision.....	4
4.1.1. Watershed Characteristics Data.....	4
4.1.2. Rain data.....	4
4.1.3. River discharge data.....	4
4.1.4. Flood hydrographic data.....	4
4.1.5. River morphology data.....	5
4.2. Condition.....	5
4.2.1. Data.....	5
4.2.2. Data testing.....	5
4.2.3. Determination of the calculation method.....	5
4.2.4. calibration.....	5
5. Calculation of flood discharge.....	8
5.1. Availability of instantaneous maximum discharge data for a period ≥ 20 years.....	8
5.1.1. Analysis of Planned Flood Discharge Frequency.....	8
5.1.2. Selection of distribution function.....	9
5.1.3. Testing the suitability of the distribution function (goodness of fit).....	9
5.1.4. Graphical approach to calculate the magnitude of planned floods.....	11
5.1.5. Analytical way.....	11
5.2. Availability of instantaneous maximum discharge data for a time period < 20 years.....	18
5.2.1. Peaks Overa Threshold method (Peaks Overa Threshold).....	18
5.2.2. The MAF method uses watershed characteristics data.....	20
5.3. The condition is that there is no/very little data on instantaneous flood discharge.....	23
5.4. Momentary maximum data availability is not available / very poor.....	23
5.4.1. Practical Rational Method.....	23
5.4.2. Empirical method.....	29
5.4.3. Comparison of parameters of flood hydrograph calculation methods.....	41
5.4.4. Mathematical model.....	44
5.5. Summary and recommendations for flood discharge calculations.....	44
Appendix A (informative) Example of calculating planned flood discharge using the unit hydrograph method.....	46
Appendix B (informative) Table of examples of data testing and calculation examples.....	50
Appendix C (informative) How to calculate the annual average flood discharge using the flood peak above threshold method.....	55
Appendix D (informative) Flood discharge using the rational method.....	56
Appendix E (informative) References A - Rainfall analysis to support flood analysis.....	59

List of Figures

Figure 1- Diagram of planning flood discharge calculations using various methods depending on data availability.....	6
Figure 2 - Procedure for calculating planned floods using frequency analysis.....	8
Figure 3 - Determination of threshold limits on the flow hydrograph.....	19
Figure 4 - Regional flood frequency curve.....	22
Figure 5 - Distribution of rain in 24 hours (according to Melchior).....	27
Figure 6 - \emptyset index method.....	30
Figure 7 - Horton method.....	30
Figure 8 - Base flow discharge.....	31
Figure 9 - Base flow discharge is drawn from the rainfall onset point to the inflexion point at the end of the flow hydrograph.....	31
Figure 10 - Base flow discharge is divided into two parts.....	31
Figure 11 - Hydrograph flow.....	32
Figure 12 - Flow hydrograph.....	32
Figure 13 - Superposition flow hydrograph.....	32
Figure 14 - Unit hydrograph.....	33
Figure 15 - Flow hydrograph calculation process.....	33
Figure 16 - SCS synthetic unit hydrograph.....	37
Figure 17 - Unit hydrograph.....	39
Figure 18 - WF Determination Sketch.....	40
Figure 19 - Sketch of RUA Determination.....	40
Figure 20 - Unit hydrograph.....	40

List of Tables

Table 1 Kolmogorov Smirnov critical values.....	10
Table 2 Relationship between distribution function, parameters and magnitude of planned flood discharge.....	16
Table 3 Gamma Standard (W).....	17
Table 4 Area under the standard normal distribution curve.....	18
Table 5 Watershed area with ARF.....	20
Table 6 V Prices for various DAS Areas.....	21
Table 7 Growth Factors GF (T, Area).....	22
Table 8 Runoff coefficient and waterproof percentage.....	23
Table 9 Cr coefficient.....	24
Table 10 Roughness coefficient (n).....	25
Table 11 Runoff coefficient values.....	25
Table 12 Coefficient values.....	26
Table 13 SCS dimensionless unit hydrograph coordinates.....	37
Table 14 Comparison of input, output and parameters of the synthetic unit hydrograph method.....	42
Table 15 Summary of approaches and methods used.....	45

CALCULATION METHOD
INITIAL RATE OF RESERVOIR SEDIMENTATION
SNI 03-6737-2002

SCOPE: This standard establishes a method for the initial calculation of reservoir sedimentation rates, which addresses requirements, provisions, methods of calculation and reporting, and initial calculation of reservoir sedimentation rate, especially based on data on flow volume and river sediment volume entering the reservoir.

SUMMARY: The standard objective of the initial reservoir sedimentation rate calculation method is to calculate the reservoir sedimentation rate for reservoir planners and managers.

The reservoir sedimentation rate is the speed of the volume of river sediment deposition in the reservoir per year.

Data for calculating sedimentation rates in reservoirs must meet the following conditions:

- 1) The volume of river flow entering the reservoir with a minimum data period of 10 years;
- 2) The volume of river sediment entering the river

SCOPE: This standard covers procedures for designing geotextiles as filters and transitions in embankment dams. It includes a description of the use of geotextiles in general, geotextiles as filters and transitions in embankment dams, filtration principles, criteria, and the use of geotextiles as sliding surfaces.

SUMMARY: Mechanical reinforcement in the use of geotextiles is intended to provide additional strength to the geotextile soil composite system and the contact area between the embankment and the foundation.

Use of geotextiles in dam Filling by Payoux (1981) outlines the main functions of geotextiles in civil engineering, including the following:

- 1) Separation and anti-contamination can involve filtration, but can also involve resistance to stress due to loading.
- 2) Filtration is preventing the migration of basic soil particles into the filter due to the drag force on the particles by flowing water.
- 3) Drainage allows for permeability along the geotextile plane so that it functions well as a filter when water flows into it, and this drainage is only limited to low fill (maximum height around 10 m).

PROCEDURES
GEOTECTIONAL DESIGN AS A FILTER AND TRANSITION
IN THE IMPAIRMENT DAM
SNI 03-6720-3-2002
Pd T-24-1999-03

The potential use of geotextiles in dams can be divided into:

- a) Temporary use during construction, which includes:
 - (a) Temporary haul roads;
 - (b) Temporary spillway protection
 - (c) Fill drainage to accelerate consolidation;
 - (d) Filter or drainage media to maintain the desired profile.
- b) Permanent use during construction. The main functions of geotextiles in civil engineering are as follows;
 - a) Separation and anti-contamination can involve filtration but can also involve resistance to stress due to loading;
 - b) Filtration prevents the migration of basic soil particles into the filter due to the flowing water's drag force on the particles.
 - c) Drainage allows for permeability along the geotextile plane so that it functions well as a filter when water flows along the geotextile;

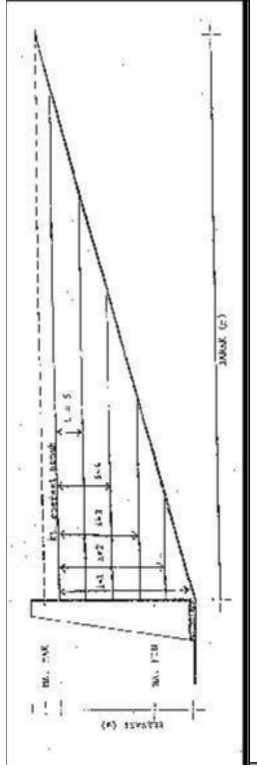
Reservoir with a minimum period of 10 years of data.

3) Reservoir volume was measured based on reservoir topography mapping during planning.

The formulas used include the Reservoir section volume formula; (view image)

$$VB = V_r - \frac{I-1}{5} V_w$$

Description:
VB = volume of reservoir section (m³)
V_w = reservoir volume (m³)



LIST OF CONTENTS

List of contents.....	i
Foreword	ii
Introduction	iii
1. Scope.....	1
2. Normative reference	1
3. Terms and Definitions	1
4. General requirement	13
4.1. General Design Requirements	13
4.2. General requirements for material durability.....	16
4.3. General requirements for calculations in design	16
4.3.1. General requirements for the forces at work.....	16
4.3.2. General requirements for soil properties	17
4.3.3. General requirements for geometric data.....	18
4.4. General requirements for geotechnical design reports	18
5. Geotechnical data	19
5.1. Scope of geotechnical data	19
5.2. Geotechnical investigation design	19
5.2.1. Geotechnical information	19
5.2.2. Soil investigation	20
5.2.3. Preliminary investigation.....	21
5.2.4. Design stage investigation.....	21
5.2.5. Checking the suitability of investigation results during construction.....	36
5.3. Soil, rock, and groundwater sampling	36
5.3.1. General	36
5.3.2. Taking soil or rock samples by drilling.....	36
5.3.3. Taking soil or rock samples by digging	36
5.3.4. Soil sampling	37
5.3.5. Rock sampling.....	38
5.3.6. Design and implementation of measurements.....	40
5.3.7. Evaluation of the Results of Groundwater Level Measurements	41
5.4. Field tests on soil and rock.....	41
5.4.1. General	41
5.4.2. Standard penetration test (Standard Penetration Test, SPT).....	43
5.4.3. Sondir test (CPT, CPTU, CPTM).....	43
5.4.4. Pressuremeter Test (PMT).....	43
5.4.5. Flat dilatometer test (Flat Dilatometer Test, DMT)	44
5.4.6. Field vane shear test (FV/T).....	44
5.4.7. Plate loading test (Plate Loading Test, PLT).....	44
5.4.8. Dynamic estimation test (Dynamic Probing Test, DP).....	44
5.5. Laboratory tests on soil.....	44
5.5.1. General	44
5.5.2. Preparation of soil test samples	45
5.5.3. Soil classification, identification, and description tests	46
5.5.4. Test the chemical and organic content of soil and water	48
5.5.5. Soil strength index test	50
5.5.6. Soil compressibility and deformation test.....	51
5.5.7. Soil compaction test.....	53
5.5.8. Soil permeability test.....	53

SNI

Indonesian National Standards

Backfill geotechnical design requirements

SNI 8460-2017

National Standardization Boards

(BSN)

5.6. Laboratory tests on rocks	54	6.10.1. Scope of work Prefabricated Vertical Drain (PVD) using vacuum method	115
5.6.1. Preparation of rock test samples	54	6.10.2. Application	116
5.6.2. Rock classification test	55	6.10.3. Materials and equipment	116
5.6.3. Swelling test of rock materials	57	6.10.4. Job process	116
5.6.4. Testing the strength of rock materials	58	6.10.5. Design criteria	118
5.7. Soil Investigation Report	62	6.10.6. Information required for job design	118
5.7.1. General	62	6.10.7. Design results	118
5.7.2. Submission of geotechnical information	62	6.10.8. Geotechnical investigations for vacuum PVD work	120
5.7.3. Evaluation of geotechnical information	63	6.10.9. Material and Installation Requirements	121
5.7.4. Determination of parameter values	64	6.10.10. Other considerations in design	125
6. Soil improvement	64	7. Stability of excavation and embankment slopes	12
6.1. Scope of land improvement	64	7.1. Scope of excavation and embankment slope stability	126
6.2. Criteria for land improvement design needs	64	7.2. Description	12
6.3. Preliminary geotechnical investigations for ground improvement works	65	7.3. Application	126
6.4. Criteria for determining the type of soil improvement	66	7.3.1. Natural slope	126
6.5. Cement injection (grouting)	67	7.3.2. Man-made slope	127
6.5.1. Scope of cement injection work	67	7.4. Data required for slope design	128
6.5.2. Technical requirements	67	7.4.1. Topographic data	128
6.5.3. Special field investigation for cement injection work	69	7.4.2. Engineering Geological Data	128
6.5.4. Material and product requirements	70	7.4.3. Soil and rock investigation data for slope stability	129
6.5.5. Sampling and testing	71	7.5. Slope design criteria	132
6.5.6. Other considerations in design	71	7.5.1. Loading criteria	132
6.6. Jet grouting	74	7.5.2. Loading and unloading criteria (stress history)	133
6.6.1. Scope of jet grouting work	74	7.5.3. Plan age criteria	133
6.6.2. Jet method	74	7.5.4. Deformation criteria	133
6.6.3. Jet yield structure	76	7.5.5. Safety factor criteria	134
6.6.4. Jet grouting parameters	77	7.6. Soil slope analysis	134
6.6.5. Custom data	77	7.6.1. Empirical and Graphical Methods	135
6.6.6. Planning	78	7.6.2. Analytical/Numerical Methods	135
6.6.7. Geotechnical investigation for jet grouting work	78	7.6.3. Analysis of slopes that have the potential to experience liquefaction	136
6.6.8. Material and product requirements	79	7.6.4. Flow analysis	136
6.6.9. Other considerations in design	80	7.6.5. Analysis of settlement and deformation of embankment slopes	136
6.7. Deep mixing	84	7.7. Rock Slope Stability Analysis	136
6.7.1. Deep mixing scope of work	84	7.7.1. Determination of parameters for Rock Slope Analysis	137
6.7.2. Information necessary for the implementation of work	85	7.7.2. Slope Stability Analysis	137
6.7.3. Geotechnical investigations	86	7.8. Instrumentation design for slope safety	138
6.7.4. Material and product requirements	87	7.8.1. Types of Slope Monitoring Instrumentation	138
6.7.5. Other considerations in design	87	7.8.2. Selection of instrumentation type	139
6.8. Deep compaction	95	7.8.3. Minimum requirements for geotechnical instrumentation for slope safety	139
6.8.1. Scope of deep compaction work	95	7.8.4. Monitoring and reporting (including interpretation, analysis, and evaluation)	139
6.8.2. Information required for the design and implementation of work	95	8. Tunnel	139
6.8.3. Geotechnical investigations for deep compression works	96	8.1. Scope of tunnel work	139
6.8.4. Material and Product Requirements	97	8.2. Mountain/rock tunnel design requirements	141
6.8.5. Other considerations in design	98	8.2.1. Design requirements	141
6.9. Prefabricated Vertical Drain (PVD)	104	8.2.2. Design procedure	141
6.9.1. Scope of work Prefabricated Vertical Drain (PVD)	104	8.2.3. Design conditions	142
6.9.2. Information required for the design and implementation of work	104	8.2.4. Design method	143
6.9.3. Geotechnical investigations for PVD work	106	8.2.5. Rock research	143
6.9.4. Material requirements	107	8.2.6. Portal and portal area requirements	144
6.9.5. Design criteria	112	8.2.7. Excavation requirements	145
6.9.6. Other considerations in design	112	8.2.8. Reinforcement requirements	146
6.10. Prefabricated Vertical Drain (PVD) with vacuum preloading method	11		

8.2.9. Tunnel wall requirements.....	152
8.2.10. Waterproofing and drainage system requirements.....	152
8.2.11. Influence of construction of adjacent structures.....	154
8.3. Shield tunnel design requirements.....	154
8.3.1. Design requirements.....	154
8.3.2. Design conditions.....	155
8.3.3. Additional facilities on the Shield Tunnel.....	160
8.3.4. Other additional methods.....	160
8.3.5. Environmental protection.....	161
8.3.6. Observing, measuring, and recording work.....	161
8.4. Underpass tunnel design requirements (dig-and-cover method).....	161
8.4.1. Investigation.....	161
8.4.2. Design basics.....	164
8.4.3. Design procedure.....	167
8.5. Other considerations in design.....	169
8.5.1. Monitoring and measurement design.....	170
8.5.2. Types of monitoring and measurement.....	171
8.5.3. Monitoring and measuring positions.....	172
8.5.4. Monitoring and measurement frequency.....	174
8.5.5. Implementation of monitoring and measurement.....	175
8.5.6. Evaluation of monitoring and measurement results.....	175
9. Foundation.....	175
9.1. Scope of foundation work.....	175
9.2. Foundation design requirements.....	175
9.2.1. Basic requirements.....	175
9.2.2. Soil characteristics.....	175
9.2.3. Permit carrying capacity.....	175
9.2.4. Decline.....	177
9.3. Structural requirements.....	178
9.3.1. Load on the foundation.....	178
9.3.2. Structural strength and serviceability.....	178
9.3.3. Resistance to shearing, lifting, and rolling.....	179
9.3.4. Resistance to buoyancy.....	179
9.4. Foundation Design Report Criteria.....	179
9.4.1. Foundation Design Analysis Report.....	179
9.4.2. Shallow foundation design report.....	180
9.4.3. Raft Foundation Design Report.....	180
9.4.4. Pile foundation design report.....	180
9.4.5. Foundation system design report, which is a combination of pile-raft foundations.....	181
9.4.6. Field investigation report.....	181
9.5. Field survey.....	182
9.5.1. General.....	182
9.5.2. Field survey.....	182
9.5.3. Soil investigation.....	182
9.6. Shallow foundation.....	183
9.7. Pile foundation.....	184
9.7.1. General.....	184
9.7.2. Single pile bearing capacity.....	186
9.7.3. Lateral load.....	187
9.7.4. Pole type.....	187
9.8. Pile foundation test (loading and integrity).....	187

9.8.1. Compressive axial load test on pile foundations.....	188
9.8.2. Tensile axial load test on pile foundations.....	189
9.8.3. Horizontal/lateral load test on pile foundations.....	189
9.8.4. Dynamic loading test (Pile Driving Analyzer, PDA) on pile foundations.....	190
9.8.5. Test the integrity of the pile on the pile foundation.....	190
9.8.6. Sonic Echo method (Pile Integrity Test, PIT) integrity test on pile foundations.....	19
10. Earth retaining structure.....	191
10.1. Scope of work of earth retaining structures.....	191
10.2. Retaining wall.....	191
10.2.1. Scope of work for retaining walls.....	191
10.2.2. Description.....	191
10.2.3. Application.....	191
10.2.4. Retaining wall type.....	192
10.2.5. Retaining wall technical requirements.....	193
10.2.6. Drainage system.....	194
10.2.7. Expansion joints and contraction joints.....	195
10.2.8. Verify the design through monitoring wall deflection/movement.....	196
10.3. Embedded walls.....	197
10.3.1. Scope of work for embedded walls.....	197
10.3.2. Description.....	197
10.3.3. Types of Embedded Walls.....	198
10.3.4. Application.....	200
10.3.5. Embedded Technical Requirements.....	201
10.3.6. Fundamental analysis and design.....	205
10.3.7. Various modes of collapse/failure.....	211
10.3.8. Tolerance for lowering the groundwater level and wall deflection tolerance.....	213
10.3.9. Design verification: monitoring wall movement, soil around the excavation, and decrease in groundwater level.....	213
10.4. Soil nailing.....	215
10.4.1. Scope of soil nailing work.....	215
10.4.2. Description.....	215
10.4.3. Other considerations in Design.....	215
10.4.4. Soil nailing technical requirements.....	217
10.4.5. Analysis and design of soil nailing walls.....	221
10.4.6. Design verification.....	229
10.5. MSE walls (MSE walls).....	232
10.5.1. MSE wall scope of work.....	232
10.5.2. Description.....	232
10.5.3. Application.....	233
10.5.4. Technical requirements.....	233
10.5.5. Basic design.....	237
10.5.6. Drainage system.....	244
10.5.7. MSE wall acceptance criteria.....	244
10.5.8. Design verification.....	245
10.6. Ground anchors.....	246
10.6.1. Scope of work for ground anchors.....	246
10.6.2. Description.....	246
10.6.3. Technical requirements.....	247
10.6.4. Soil anchor design.....	249
10.6.5. Acceptance criteria.....	254
10.6.6. Design verification.....	256

11. 10.6.7. Conformity tests and acceptance tests on production anchors.....	257
11.1. Deep Digging.....	259
11.1.1. Scope of work for Deep Excavation.....	259
11.1.2. Technical requirements for Deep Excavation design.....	259
11.1.3. Open excavation construction.....	260
11.1.4. Retaining wall construction.....	260
11.4.1. Static ground pressure.....	261
11.4.2. Dynamic condition earth pressure.....	262
11.5. Subsidence of the land surface around the excavation.....	262
11.6. Instrumentation and monitoring.....	263
12. Seismicity.....	263
12.1. Scope of Seismicity.....	263
12.2. Technical requirements for seismic design.....	263
12.2.1. Earthquake resistance requirements.....	263
12.2.2. Design response spectrum requirements.....	266
12.2.3. Design response spectrum requirements are based on site-specific evaluation.....	273
12.2.4. Earthquake design requirements for Foundations.....	275
12.2.5. Seismic provisions for retaining Walls.....	277
12.2.6. Earthquake requirements for dams.....	278
12.2.7. Seismic requirements for slopes.....	278
12.2.8. Earthquake requirements for buried Structures.....	279
13. Hydraulic collapse.....	279
13.1. Scope of hydraulic collapse.....	279
13.2. Destruction due to uplift forces.....	280
13.3. Demolition of the excavation base due to boiling.....	282
13.4. Body erosion.....	283
13.4.1. Downstream erosion (backward erosion).....	283
13.4.2. Suffosi (suffosion).....	284
13.4.3. Hydraulic failure due to dispersive soils.....	285
13.5. Hydraulic failure by the decline of building foundations.....	285
13.5.1. Hydraulic failure of earth fill dam foundations and embankments.....	285
13.5.2. Hydraulic failure in concrete dams.....	286
13.6. Erosion at the embankment interface with a closed channel across the dam.....	288
13.7. Rockfill dam collapse due to hydraulic fracturing.....	289
13.7.1. Factors that influence the occurrence of hydraulic cracks (hydraulic fracturing).....	289
13.7.2. Design of hydraulic fracturing free rock fill dams.....	290
13.8. Design earthfill dams and embankments to prevent hydraulic collapse.....	290
13.8.1. Installation of filters and internal drainage in earth fill dams and embankments.....	290
13.8.2. Limitations on the height of earth fill dams and embankments and the internal shape of the filter.....	290
13.8.3. The use of diaphragm filters in the construction of closed channels across dams.....	293
13.8.4. Filter design.....	294
Bibliography.....	297
Table 1 - Summary of application of field investigation methods.....	24
Table 2 - Minimum number of soil investigations.....	25
Table 3 - Soil sample quality classes for laboratory tests and soil sampling categories.....	30
Table 4 - Recommended minimum number of test specimens.....	33

Table 5 - Classification test.....	34
Table 6 - Laboratory tests for determining geotechnical parameters.....	35
Table 7 - Classification tests, recommendations for the minimum number of samples to be tested in one soil layer.....	46
Table 8 - Minimum number of tests for one soil layer in the oedometer test with increasing load.....	52
Table 9 - Minimum number of test objects for permeability tests on one soil layer.....	54
Table 10 - Preliminary field tests for soil improvement works.....	66
Table 11 - Preliminary laboratory tests for soil improvement work.....	66
Table 12 - Recommended list of jet grouting design activities.....	78
Table 13 - Common binders and fillers used in deep mixing (BS EN 14679:2005).....	93
Table 14 - Construction parameters (BS EN 14679:2005).....	94
Table 15 - Typical filler gradations.....	98
Table 16 - Minimum flow capacity (BS EN 15237:2007).....	109
Table 17 - Test frequency for quality control (BS EN 15237:2007).....	110
Table 18 - Geotextile classes for separators (AASHTO M-228-96).....	122
Table 19 - Geotextile classes for separators (AASHTO M-228-96).....	122
Table 20 - Properties, requirements, and test methods.....	123
Table 21 - Field tests for slope stability investigation.....	129
Table 22 - Laboratory tests for investigating soil slope stability.....	130
Table 23 - Laboratory tests for investigating the stability of rock slopes.....	130
Table 24 - Traffic loads for stability analysis (DPU, 2001) and off-road loads.....	133
Table 25 - Safety factor values for soil slopes.....	134
Table 26 - Recommended safety factor values for rock slopes.....	134
Table 27 - Comparison of tunnel types (JSCE, 2007).....	140
Table 28 - Criteria for selecting the type of tunnel reinforcement.....	146
Table 29 - Types of tunnel strengthening patterns based on RMR rock classification (Bieniawski, 1989).....	147
Table 30 - Minimum requirements for reinforcement patterns for road tunnels (JSCE, 2007).....	147
Table 31 - Typical reinforcement changes during the construction phase (JSCE, 2007).....	147
Table 32 - Minimum compressive strength requirements for spray concrete for road tunnels.....	148
Table 33 - Typical classification of damage based on maximum building slope and settlement (CIRIA PR30, 1996).....	159
Table 34 - Concepts applied when combining design loads (JSCE, 2008).....	168
Table 35 - Loads to be evaluated.....	168
Table 36 - Standards for Materials.....	169
Table 37 - Typical crown settlement and convergence measurement intervals.....	173
Table 38 - Guidelines for surface and soil/rock movement Measurements.....	174
Table 39 - Variables (δ/ρ) and C as a function of soil conditions (FHWA-NHI-14-007).....	228
Table 40 - Loading schedule and dial gauge readings.....	230
Table 41 - Permissible nail movements in creep tests.....	231
Table 42 - Face covering immersion requirements (FHWA, 2009).....	234
Table 43 - Embankment material requirements in reinforced zones.....	237
Table 44 - Summary of minimum safety factors for four potential external failures (extracted from FHWA NHI 00 043).....	238
Table 45 - Settlement difference limits as a function of joint gap width.....	245
Table 46 - Differential reduction limits for various types of face coverings.....	245
Table 47 - Monitoring parameters and instrumentation that can be used.....	246
Table 48 - Anchorage coefficient, K_s (Canadian Foundation Engineering Manual).....	253
Table 49 - Recommended minimum safety factors (BS 8081).....	254
Table 50 - Acceptance criteria for the residual load vs time relationship (BS 8081).....	256
Table 51 - Maximum limits of lateral deformation of walls.....	262

Table 52 – Earthquake Design Criteria based on Infrastructure Designation	264
Table 53 - Site classification (AASHTO, 2012)	267
Table 54 - Parameters and test methods used to obtain site class parameters	267
Table 55 - Amplification factor for PGA and 0.2 second period (F _{pga} and F _a) (AASHTO, 2012) 269	269
Table 56 - Amplification factor value for 1 second period (F _v) (AASHTO, 2012)	269
Table 57 – Prediction of crack systems (joints) in rocks from Lugeon values	288
Table 60 – Filter criteria from USBR (2011) and FEMA (2011)	296
Table 61 – Filter gradation limits to prevent filter segregation	296
Figure 1 – In-depth soil investigation	27
Figure 2 – Types of Soil Improvement Methods	67
Figure 3 – Cement injection pipe and packer	68
Figure 4 - Jet grouting system (BS EN 12716:2001)	76
Figure 5 – Jet grouting structure (BS EN 12716:2001)	77
Figure 6 – Some jet grouting applications (BS EN 12716:2001 and others)	81
Figure 7 – Pattern and configuration of deep mixing columns (BS-EN 1479:2005)	84
Figure 8 – General classification of deep mixing methods (BS EN 14679:2005)	85
Figure 9 – Some applications of deep mixing methods (BS EN 14679:2005)	88
Figure 10 – Process flow diagram for designing and implementing deep mixing work (BS EN 14679-2005)	90
Figure 11 – Detailed iterative process flow diagram for deep mixing design (BS EN 14679-2005)	91
Figure 12 – Scheme of repair with PVD	113
Figure 13 – PVD job design process diagram	113
Figure 14 – Schematic instrumentation for PVD performance monitoring (modified from FHWA, 1986)	115
Figure 15 – Position of drill points for slopes with small failure area widths	131
Figure 16 - Piece AA in Figure 15	131
Figure 17 – Position of drill points for slopes with large failure area widths	132
Figure 18 – Failure patterns and determination of rock strength in slope stability analysis	137
Figure 19 - Mountain/rock tunnel design procedure	142
Figure 20 - Typical tunnel portal area (JSCE, 2007)	145
Figure 21 – Classification of locking systems for rock bolts (JSCE, 2007)	149
Figure 22 – Distribution of rock bolts in transverse profile (JSCE, 2007)	150
Figure 23 – Distribution of rock bolts in longitudinal profile (JSCE, 2007)	150
Figure 24 - Variations in the shape of steel support systems (JSCE, 2007)	151
Figure 25 - Tunnel wall shape (JSCE, 2007)	152
Figure 26 - Waterproofing and drainage system for road tunnels (JSCE, 2007)	153
Figure 27 - Road tunnel drainage system	154
Figure 28 - Cross section of predicted settlement above the tunnel (FHWA-IF-05-023)	160
Figure 29 – Basis for determining the size of internal sections	165
Figure 30 - Objectives and roles of monitoring and measurement	170
Figure 31 – Arrangement of crown settlement/convergence measurement lines (for excavation width D approx. 10 m)	173
Figure 32 - Arrangement of various instruments (for excavation width D = +10m)	173
Figure 33 – Surface movement measurements and examples of the arrangement of soil/rock movement measurement points	174
Figure 34 - Load-settlement curve for shallow foundations	177
Figure 35 – Typical dimensions of a retaining wall	193
Figure 36 – Drainage system on retaining wall	195
Figure 37 – Joints in a retaining wall: (a) loose joints, (b) contraction joints	196
Figure 38 – Several failure modes of retaining walls	197
Figure 39 – Various types of embedded walls	199
Figure 40 – Various types of support systems	200
Figure 41 - Flowchart for designing embedded walls	206
Figure 42 – Pressure diagram for free earth support and fixed earth support	207
Figure 43 - Illustration of the beam-column model	209
Figure 44 – Various failure modes of embedded walls	212
Figure 45 – Typical section of a soil nailing wall and details around the nail head (FHWA0-IF-03-017)	215
Figure 46 – Typical stages of carrying out soil nailing (drilled and grouted soil nailing) walls (FHWA-NHI-14-007)	217
Figure 47 – Nail bar installation pattern: a) rectangular pattern, b) triangular pattern (FHWA-NHI-14-007)	218
Figure 48 – Complementary materials: a) centralizer (FHWA-NHI-14-007), b) nail bar wrapped in the corrugated sheath (BS 8006-2, 2011)	219
Figure 49 – a) Internal stability, b) Global stability (FHWA-NHI-14-007)	222
Figure 50 – a) Location of maximum tensile force on the nail bar; b) Potential slip area and changes in tensile force on the nail bar along with the excavation stages; c) Critical condition during excavation in the middle, sprayed concrete and nail bars have not been installed, and there is seepage (FHWA-NHI-14-007)	223
Figure 51 – Inspection of the punch on the face wall	226
Figure 52 – Drainage system and waste edge channel details (FHWA-NHI-14-007)	227
Figure 53 – Illustration of soil nailing wall deformation (FHWA-NHI-14-007)	229
Figure 54 – Set up of tensile test equipment on nail bars (FHWA0-IF-03-017)	230
Figure 55 – Minimum instrumentation installation locations	231
Figure 56 – Typical section of MSE wall (FHWA NHI-10-024)	232
Figure 57 – Illustration of face covering immersion requirements (GEO Hong Kong, 2002)	234
Figure 58 – Movement of MSE walls due to decrease in foundation soil consolidation (GEO Hong Kong, 2002)	236
Figure 59 – External stability calculation flow diagram	239
Figure 60 – Soil pressure for external stability analysis	240
Figure 61 – Internal stability calculation flow diagram	243
Figure 62 – One alternative surface and subsurface drainage system (GEO Hong Kong, 2002)	244
Figure 63 – Anchorage system and anchor heads	24
Figure 64 - One example of a permanent ground anchor with a single corrugated sheet	249
Figure 65 – Fixed length position requirements (BS 8081)	250
Figure 66 – Flow diagram of design and implementation of ground anchors	251
Figure 67 – Tendon elastic elongation criteria (BS 8081)	255
Figure 68 – Investigation test loading procedure (BS 8081)	257
Figure 69 – Conformity test loading procedure (a) permanent anchors (b) temporary anchors (BS 8081)	258
Figure 70 – Acceptance test loading procedure (a) permanent anchors (b) temporary anchors (BS 8081)	258
Figure 71 – Design response spectrum (SNI 1726:2012)	271
Figure 72 - Design response spectrum, formed using the three-point method (AASHTO, 2012)	271
Figure 73 – Mononobe-Okabe method style diagram (AASHTO, 2012)	277
Figure 74 – Example of a building with an uplift that needs to be checked	281
Figure 75 – Collapse of a concrete dam foundation due to buoyancy	281
Figure 76 – Examples of possible conditions for boiling to occur	282

Table 52 – Earthquake Design Criteria based on Infrastructure Designation	264
Table 53 - Site classification (AASHTO, 2012)	267
Table 54 - Parameters and test methods used to obtain site class parameters	267
Table 55 - Amplification factor for PGA and 0.2 second period (F _{pga} and F _a) (AASHTO, 2012) 269	269
Table 56 - Amplification factor value for 1 second period (F _v) (AASHTO, 2012)	269
Table 57 – Prediction of crack systems (joints) in rocks from Lugeon values	288
Table 60 – Filter criteria from USBR (2011) and FEMA (2011)	296
Table 61 – Filter gradation limits to prevent filter segregation	296
Figure 1 – In-depth soil investigation	27
Figure 2 – Types of Soil Improvement Methods	67
Figure 3 – Cement injection pipe and packer	68
Figure 4 - Jet grouting system (BS EN 12716:2001)	76
Figure 5 – Jet grouting structure (BS EN 12716:2001)	77
Figure 6 – Some jet grouting applications (BS EN 12716:2001 and others)	81
Figure 7 – Pattern and configuration of deep mixing columns (BS-EN 1479:2005)	84
Figure 8 – General classification of deep mixing methods (BS EN 14679:2005)	85
Figure 9 – Some applications of deep mixing methods (BS EN 14679:2005)	88
Figure 10 – Process flow diagram for designing and implementing deep mixing work (BS EN 14679-2005)	90
Figure 11 – Detailed iterative process flow diagram for deep mixing design (BS EN 14679-2005)	91
Figure 12 – Scheme of repair with PVD	113
Figure 13 – PVD job design process diagram	113
Figure 14 – Schematic instrumentation for PVD performance monitoring (modified from FHWA, 1986)	115
Figure 15 – Position of drill points for slopes with small failure area widths	131
Figure 16 - Piece AA in Figure 15	131
Figure 17 – Position of drill points for slopes with large failure area widths	132
Figure 18 – Failure patterns and determination of rock strength in slope stability analysis	137
Figure 19 - Mountain/rock tunnel design procedure	142
Figure 20 - Typical tunnel portal area (JSCE, 2007)	145
Figure 21 – Classification of locking systems for rock bolts (JSCE, 2007)	149
Figure 22 – Distribution of rock bolts in transverse profile (JSCE, 2007)	150
Figure 23 – Distribution of rock bolts in longitudinal profile (JSCE, 2007)	150
Figure 24 - Variations in the shape of steel support systems (JSCE, 2007)	151
Figure 25 - Tunnel wall shape (JSCE, 2007)	152
Figure 26 - Waterproofing and drainage system for road tunnels (JSCE, 2007)	153
Figure 27 - Road tunnel drainage system	154
Figure 28 - Cross section of predicted settlement above the tunnel (FHWA-IF-05-023)	160
Figure 29 – Basis for determining the size of internal sections	165
Figure 30 - Objectives and roles of monitoring and measurement	170
Figure 31 – Arrangement of crown settlement/convergence measurement lines (for excavation width D approx. 10 m)	173
Figure 32 - Arrangement of various instruments (for excavation width D = +10m)	173
Figure 33 – Surface movement measurements and examples of the arrangement of soil/rock movement measurement points	174
Figure 34 - Load-settlement curve for shallow foundations	177
Figure 35 – Typical dimensions of a retaining wall	193
Figure 36 – Drainage system on retaining wall	195

Figure 77 – Illustration of hydraulic failure by downstream erosion	284
Figure 78 – Illustration of hydraulic collapse by suction	284
Figure 79 – Illustration of hydraulic failure by dispersive fill material	285
Figure 80 – Illustration of hydraulic failure in rock-fill dam foundations and embankments	286
Figure 81 – Illustration of hydraulic failure of a dam foundation starting from the dam body	286
Figure 82 – Collapse of concrete dam foundation due to erosion	287
Figure 83 – Illustration of curtain grouting and blanket grouting	287
Figure 84 – Illustration of hydraulic failure in embankment interaction with a closed channel structure	288
Figure 85 – Sketch of hydraulic fracturing in a rockfill dam	289
Figure 86 – Typical cross-section of a homogeneous earth dam	291
Figure 87 – Cross section of a typical earthen dam with toe drain	292
Figure 88 – Cross section of a typical earth dam with horizontal drainage	292
Figure 89 – Cross section of a typical earth dam with vertical and horizontal drainage	293
Figure 90 – Sketch of a diaphragm filter in a closed channel across a dam (Cooper, 2007)	294
Figure 91 – Diaphragm filter dimensions in a secure channel across the dam	294
Figure 92 – Rockfill dam filter zone (Foster and Fell, 2001)	295

SNI

Indonesian National Standards

Procedures for Designing the Body of an Embankment-Type Dam

SNI 8062_2015

National Standardization Boards (BSN)

LIST OF CONTENTS

List of contents.....	i
Foreword	ii
Introduction	iii
1. Scope.....	1
2. Normative reference	1
3. Terms and Definitions	3
4. General terms and conditions	6
5. Data and information.....	7
6. Considerations in the Design of embankment type dam.....	10
7. Engineering geotechnical and geological investigations.....	14
8. Foundation and embankment design.....	19
9. Dam body design.....	23
Appendix A.....	30
Appendix B.....	39
Appendix C.....	52
Appendix D.....	56
Bibliography.....	64

SNI

Indonesian National Standards

How to test field penetration with SPT

SNI 4153:2008

National Standardization Boards

(BSN)

LIST OF CONTENTS

List of contents.....	i
Foreword	ii
Introduction	iii
1. Scope.....	1
2. Normative reference	1
3. Terms and definitions	1
4. Function and Conditions.....	3
5. Procedure for determining the gradation of protective filter materials in embankment- type dams.....	3
Appendix A (informative)	12
Appendix B (informative)	13
Appendix C (normative).....	16
Appendix D (informative)	17
Appendix E (informative).....	18
Bibliography	18

SNI

Indonesian National Standards

How to test field penetration with SPT

SNI 4153:2008

National Standardization Boards (BSN)

LIST OF CONTENTS

List of contents	i
Foreword	ii
Introduction	iii
1. Scope	1
2. Normative reference	1
3. terms and definitions	1
4. Terms and conditions	2
4.1. Equipment	2
4.2. Material	3
4.3. Testing	3
4.3.1. Penetration testing with SPT	3
4.3.2. calibration	3
4.3.3. Officer	3
4.3.4. Responsible for testing	3
5. Testing	3
5.1. Test preparation	4
5.2. Test procedure	5
5.3. Correction of SPT test results	8
6. Test Report	9
Appendix A: Flow chart of field penetration test method with SPT (normative)	9
Appendix B: Example of field penetration test form with SPT (informative)	11
Appendix C: Table listing technical deviations and their explanations (informative)	13
Bibliography	14

SNI

Indonesian National Standards

How to test pressurized water in the field

SNI 2411:2008

National Standardization Boards (BSN)

LIST OF CONTENTS

List of contents.....	i
Foreword	ii
Introduction	iii
1. Scope.....	1
2. Normative reference.....	1
3. Terms and definitions.....	1
4. Terms and conditions.....	2
4.1. Equipment.....	2
4.2. Water.....	3
4.3. calibration.....	3
4.4. Work safety.....	3
4.5. Officers and people in charge.....	3
5. Testing method.....	4
5.1. Preparation.....	4
5.2. Drilling work.....	4
5.3. Determination of maximum pressure.....	4
5.4. Water pass testing.....	4
5.5. Data recording.....	5
6. Calculation.....	5
6.1. Calculation of water passing coefficient (k).....	5
6.2. Lugeon value calculation.....	6
7. Determination of the value of the Lugeon.....	6
8. Special thing.....	7
8.1. Unconsolidated soil/borehole collapse.....	7
8.2. Angled drill hole.....	7
8.3. Causes of test errors.....	8
9. Report.....	8
Appendix A Flow Chart (normative).....	9
Appendix B Pictures of how to pass pressurized water tests in the field (normative).....	11
Appendix C Example of a form (normative).....	17
Appendix D List of technical deviations and explanations (Informative).....	20
Bibliography.....	21

SNI

Indonesian National Standards

Attenberg Limit

SNI 1966_2008

National Standardization Boards (BSN)

LIST OF CONTENTS

List of contents.....	i
Foreword	ii
Introduction	iii
1. Scope.....	1
2. Normative reference	1
3. Terms, definitions and notation.....	1
4. General requirements.....	1
4.1. Equipment.....	1
5. Test Objects.....	3
6. Working method.....	3
7. Calculations and Reporting.....	4
7.10 Calculation.....	4
7.11 Reporting.....	5
Appendix A (Normative) Example of test formula.....	6
Appendix B (Informative) Example of filling in the test formula.....	7
Appendix C (Informative) Figure.....	8
Bibliography	9
Figure 1 Plastic limit shaking tool.....	2
Figure C.1 Braiding Method.....	8

SNI

Indonesian National Standards

SNI 1726-2019

Structural Concrete Requirements for Buildings

National Standardization Boards

(BSN)

LIST OF CONTENTS

List of contents.....	i
List of Figures.....	iii
List of Tables.....	iv
Foreword.....	vi
1. Scope.....	1
1.1. General.....	1
1.2. Performance-based analysis procedures.....	1
2. Normative reference.....	3
3. Terms, definitions, and notation.....	3
4. General requirements.....	23
4.1. Earthquake planning, earthquake priority factors and building structure risk Categories.....	23
4.2. Combination of factored load and service load.....	25
5. Site classification procedures for seismic design.....	28
5.1. Site classification.....	29
5.2. Site response analysis for SF site class soils.....	29
5.3. Site class definition.....	29
5.4. Definitions for site class parameters.....	31
6. Earthquake area and response spectrum.....	32
6.1. Earthquake acceleration parameters.....	33
6.2. Site coefficients and maximum considered risk-targeted earthquake acceleration (MCER) spectral response parameters.....	34
6.3. Design spectral acceleration parameters.....	35
6.4. Response spectrum.....	35
6.5. Design Category.....	36
6.6. Design requirements for seismic design category A.....	37
6.7. Geological hazards and geotechnical investigations.....	38
6.8. The maximum risk-targeted earthquake response spectrum (MCER).....	40
6.9. Site-specific ground motion procedures.....	40
6.10. Site-specific ground motion procedures for seismic design.....	40
6.11. Vertical ground motion for earthquake planning.....	44
7. Requirements for seismic design of building structures.....	45
7.1. Upper structure and lower structure.....	45
7.2. Seismic force resisting structural system.....	47
7.3. Diaphragm flexibility, configuration irregularity and redundancy.....	56
7.4. Combination and influence of seismic Loads.....	64
7.5. Loading direction.....	66
7.6. Selection of Analytical Procedures.....	67
7.7. Modelling criteria.....	68
7.8. Equivalent lateral force procedure.....	69
7.9. Dynamic Linear Analysis.....	77
7.10. Diaphragm, chord and collector.....	81
7.11. Structural walls and their anchorage.....	86
7.12. Deviation between levels and deformation.....	88
7.13. Foundation design.....	90
8. Simplified structural design criteria for supporting walls or simple building frame systems.....	97
8.1. General.....	97
8.2. Basic design.....	100
8.3. Effect of seismic and combined loads.....	100
8.4. Seismic force resisting system.....	103
8.5. Diaphragm flexibility.....	104
8.6. Application of loading.....	104
8.7. Design and detailing requirements.....	104
8.8. Simplified lateral force analysis procedure.....	106
9. Seismic design requirements for nonstructural elements.....	108
9.1. Scope.....	108
9.2. Seismic planning for nonstructural components.....	110
9.3. Anchorage of nonstructural features.....	114
9.4. Architectural elements.....	116
9.5. Mechanical and Electrical Elements.....	122
9.6. Consensus standards and other reviewed documents.....	132
10. Seismic design requirements for non-building structures.....	132
10.1. General.....	132
10.2. A non-building structure that is supported by another structure.....	134
10.3. Structural design requirements.....	135
10.4. Non-building structures resemble buildings.....	142
10.5. General requirements for non-building structures that do not resemble buildings.....	146
10.6. Tanks and vessels.....	148
10.7. Consensus standards and other reviewed documents.....	164
11. Nonlinear response time history analysis.....	165
11.1. General requirement.....	165
11.2. Basic ground movement.....	166
11.3. Modelling and analysis.....	168
11.4. Analysis results and acceptance criteria.....	169
11.5. Review design.....	171
11.6. Consensus standards and other reviewed documents.....	172
12. Structure with base isolation.....	172
12.1. Scope.....	172
12.2. General Planning Requirements.....	172
12.3. Seismic ground motion criteria.....	178
12.4. Selection of Analytical Procedures.....	179
12.5. Equivalent lateral force procedure.....	180
12.6. Dynamic analysis procedures.....	185
12.7. Planning review.....	189
12.8. Testing.....	189
13. Seismic design requirements for structures with damping systems.....	194
13.1. Scope.....	194
13.2. General design requirements.....	194
13.3. Nonlinear response history procedure.....	199
13.4. Seismic load Conditions and acceptance criteria for Nonlinear Response Procedures.....	200
13.5. Design studies.....	201
13.6. Testing.....	201
13.7. Alternative procedures and their acceptance criteria.....	205
14. Soil-structure interaction for seismic resistant building design.....	222
14.1. Scope.....	222

14.2 Adjustment of soil-structure interactions/tailored structural requirements for soil-structure interactions	222
14.3 Foundation damping effect	225
14.4 Effects of kinematic soil-structure interactions	230
14.5 Consensus standards and other reference documents	231
15. Seismic ground motion maps and risk coefficients	231
Supporting information regarding standard formulators	239

List of Figures

Figure 1 – Illustration of a dividing rod (stud) in a wall	7
Figure 2 – Fault distances for various project site locations	33
Figure 3 – Design response spectrum	36
Figure 4 – Flexible diaphragm	57
Figure 5 – Horizontal irregularities	60
Figure 6 – Vertical irregularities	62
Figure 7 – Determination of the height-to-length ratio of shear walls and wall pillars	64
Figure 8 – Illustration of the ground surface (grade plane)	71
Figure 9 – Torque magnification factor, A_x	75
Figure 10 – Determination of deviation between levels	75
Figure 11 – Collector	83
Figure 12 – Calculation of the design acceleration coefficient C_{px} in buildings with $N \leq 2$ and in buildings with $N \geq 3$ (N is the number of floors)	84
Figure 13 – Dynamic amplification factors for Components	112
Figure 14 – Nominal properties for a bilinear force-displacement model insulator	193
Figure 15 – Ground motion parameter S_s , maximum earthquake considered a targeted risk (MCER) for the Indonesian region for a 0.2-second response spectrum (critical attenuation 5 %)	233
Figure 16 – Ground motion parameter, S_1 , maximum considered targeted-risk earthquake (MCER) for the Indonesian region for a 0.2-second response spectrum (critical attenuation 5 %)	234
Figure 17 – PGA. The maximum earthquake considered is the geometric average (MCEG) of the Indonesian region	235
Figure 18 – CRS, Mapped risk coefficient, 0.2-second response spectrum period	236
Figure 19 – CRI, Mapped risk coefficient, 1 second spectral response period	237
Figure 20 – Long period transition map, NE, region of Indonesia	238

List of tables

Table 1 – Reliability targets (conditional probability of failure) for structural stability due to earthquake loads	1
Table 2 – Reliability Target (conditional probability of failure) for ordinary non-critical structural components due to earthquake loads	2
Table 3 – Building and non-building risk categories for earthquake loads	24
Table 3 – Building and non-building risk categories for earthquake loads (continued)	25
Table 4 – Main Earthquake Factors	25
Table 5 – Site classification	29
Table 6 – Site coefficients, F_a	34
Table 7 – Site coefficient, F_v	34
Table 8 – Seismic design categories based on acceleration response parameters in short periods	37
Table 9 – Seismic design categories based on acceleration response parameters in 1 second	37

Table 10 – FPGAs Site Coefficients	39
Table 11 – Vertical Coefficient Value C_v	45
Table 12 – Factors R , C_d , and Ω for seismic force-resisting systems	49
Table 13 – Horizontal irregularities in Structures	59
Table 14 – Vertical abnormalities in Structures	61
Table 15 – Requirements for individual stories resisting more than 35 % of the base shear force	63
Table 16 – Permitted analysis procedures	68
Table 17 – Coefficients for the upper bound in the calculated period	72
Table 18 – Approach period parameter values C_t and x	72
Table 19 – Diaphragm design force reduction factor, R_s	86
Table 20 – Deviations between clearance levels, $\Delta_{aa,b}$	88
Table 21 – Upper limits of horizontal soil displacement due to lateral creep for shallow foundations	95
Table 22 – Limit difference reduction	95
Table 23 – Coefficients and design factors for seismic force-resisting systems for simplified design procedures	99
Table 23 – Coefficients and design factors for seismic force-resisting systems for simplified design procedures (continued)	100
Table 24 – Coefficients for architectural elements	116
Table 25 – Reference standards for sealing glass structures	118
Table 26 – Seismic coefficients for mechanical and electrical components	123
Table 27 – Seismic coefficients for non-building systems similar to buildings	138
Table 28 – Seismic coefficients for non-building-like systems	139
Table 29 – Design minimum deflections for piping connections	151
Table 30 – Anchorage ratio	151
Table 31 – Minimum guard height required	155
Table 32 – Maximum material strength	162
Table 33 – Load factors for force-controlled behavior	171
Table 34 – Seismic resistance factors for critical and ordinary controlled actions	171
Table 35 – Damping factor, B_M	181
Table 36 – Damping coefficient, $BV+I$, BID , BIE , BR , BIM , BmD , BmM (when structural period $\geq T_0$)	210
Table 37 – Force coefficients, ${}^a b C_{mFD}$	221
Table 38 – Force coefficient, ${}^{ab} C_{mFD}$	222
Table 39 – Effective shear wave velocity ratio (V_s/V_{s0})	228
Table 40 – Effective shear modulus ratio (G/G_0)	228
Table 41 – Soil hysteretic damping ratio β_s	229

SNI

Indonesian National Standards

**Procedures for controlling sedimentation in
reservoirs**

SNI 19-6459-2000

**National Standardization Boards
(BSN)**

LIST OF CONTENTS

1. Scope	1
2. Reference	1
3. Understanding	1
4. Introduction	1
5. Sediment handover	2
6. Sediment deposits	13
7. Sediment control	20
8. Secondary influences	31
Appendix A: Glossary of Terms	38
Appendix B: Figures	39
Appendix C: List of Names and Institutions	57

SNI

Indonesian National Standards

Preparation of Geological Maps

SNI 13-4691-1998

National Standardization Boards (BSN)

LIST OF CONTENTS

BACKGROUND.....	ii
LIST OF CONTENTS.....	iii
LIST OF FIGURES.....	iv
LIST OF TABLES.....	iv
1. GENERAL REQUIREMENTS.....	1
1.1. Purpose and Objectives.....	1
1.1.1. Meaning.....	1
1.1.2. Objective.....	1
1.2. Scope.....	1
1.3. Definition.....	1
1.4. Understanding.....	1
2. TECHNICAL REQUIREMENTS.....	3
2.1. Symbol.....	3
2.1.1. Abbreviation.....	3
2.1.2. Color layout.....	4
2.1.3. Geological symbols and patterns.....	5
2.2. Term.....	5
2.3. Map Description.....	5
2.4. Map presentation.....	5
2.5. Publishing.....	6
2.5.1. Raw material.....	6
2.5.2. Size.....	6
2.6. Specification.....	6
2.7. System geological map sheet size.....	6
3. MAIN ADDITIONAL ELEMENTS.....	8
3.1. Map preparation.....	8
3.1.1. Data collection and preparation.....	8
3.1.2. Data preparation.....	8
3.1.3. Map review.....	10
3.2. Quality.....	10
3.3. Packaging.....	10
3.4. Documentation.....	11

LIST OF FIGURES

Figure 1. Letter abbreviation of chronostratigraphic units used on geological maps.....	12
Figure 2. Default color chart for geological maps.....	13
Figure 3. Colors that differentiate the type and age of rocks and the fundamental patterns used on geological maps.....	14
Figure 4. Symbols used on geological maps.....	15
Figure 5. Work stages of geological mapping activities.....	22
Figure 6. Layout of marginal information on a geological map.....	23
Figure 7. Example of correlation of stratigraphic units on a geological map.....	24

LIST OF TABLES

Table 1. Recommendations for the number of path lengths, sampling and number of samples analysed when making geological maps.....	25
---	----

LIST OF CONTENTS

List of contents.....i

1. Scope.....	1
2. Reference.....	1
3. Understanding.....	1
4. Types of connections.....	3
5. Selection of Type and Material.....	3
6. Water retaining material specifications.....	6

APPENDIX A Glossary of Terms..... 9

APPENDIX B Tables.....13

APPENDIX C List of Names and Institutions.....14

SNI

Indonesian National Standards

**Specifications for connection materials in concrete
dams part 1**

SNI 03-64161-2000

**National Standardization Boards
(BSN)**

SNI

Indonesian National Standards

**Procedures for hydraulic design of a fixed weir
body with an MDL-type energy reducer**

SNI 03-7043-2004

**National Standardization Boards
(BSN)**

LIST OF CONTENTS

List of contents.....	i
Foreword.....	ii
Introduction	iii
1. Scope.....	1
2. Normative Reference.....	1
3. Terms and definitions.....	1
4. Symbols.....	3
5. Provision.....	3
6. Condition.....	6
7. How to plan Engineering.....	6
Bibliography	8
APPENDIX A Fig.....	9
APPENDIX B Flowchart.....	13
APPENDIX C Calculation example.....	14
APPENDIX D Example Image.....	16

LIST OF CONTENTS

List of contents..... i
Foreword..... ii
1. Scope..... 1
2. Reference..... 1
3. Geotextile hole dimension gauge..... 1
4. Geotextile transverse permeability measurement..... 2
5. Filter permeability requirements..... 3

APPENDIX A: Glossary of terms..... 6

SNI

Indonesian National Standards

**Geotextiles - Part 2:
Procedures for measuring hole diameter and
permeability of geotextiles as filters and
transitions in embankment dams
SNI 03-6720.2-2002**

National Standardization Boards (BSN)

LIST OF CONTENTS

List of contents..... i
Foreword..... ii
1. Scope 1
2. Normative Reference 1
3. Construction Issues and strength requirements 1
4. Geotextile durability 5
5. Conclusion 7

APPENDIX A 9

SNI

Indonesian National Standards

Geotextiles - Part 1:

**Procedures for installing geotextiles as filters and
transitions in embankment dams**

SNI 03-6720.1-2002

National Standardization Boards (BSN)

SNI

Indonesian National Standards

PROCEDURES

QUALITY CONTROL OF EMBANKMENT DAM

SNI 03-6465-2000

**National Standardization Boards
(BSN)**

LIST OF CONTENTS

1. Scope	1
2. Reference	1
3. Understanding	1
4. Utility	1
5. Preparation for Construction Implementation	3
6. Quality Control at Construction Sites	5
7. Quality Control Responsibilities	8
APPENDIX A: LIST OF TERMS	14
APPENDIX B: Special Testing	15
APPENDIX C: List of Names and Institutions	16

LIST OF CONTENTS

SNI
Indonesian National Standards
SNI 03-6460.1-2000
Tunneling Safety Procedures for Civil Construction
Part 1
Planning And Organization
National Standardization Boards
(BSN)

	Matter.
1. Scope.....	1
2. References.....	1
3. Understanding.....	1
4. Inundation.....	1
5. Methane Gas.....	5
6. Fire Prevention.....	7
7. Fire Fighting and Rescue.....	11
8. Work Environment.....	13
9. Dust.....	21
10. Lighting Quality.....	23
Appendix A: Glossary of Terms.....	25
Appendix B: List of Names and Institutions.....	27

LIST OF CONTENTS

1. Scope.....	1
2. Reference.....	1
3. Understanding.....	1
4. Organization and Administration.....	1
4.1. General.....	1
4.2. Precontractual Arrangements.....	1
4.3. Implementation of Contracts in the Field.....	2
4.3.1. Contract Implementation Management.....	2
4.3.2. Temporary Work.....	2
4.3.3. Supervision and Inspection.....	3
4.3.4. Applicable laws and regulations.....	3
4.4. Accidents and dangerous events.....	5
4.4.1. Accident.....	5
4.4.2. Protective/Safety Equipment.....	5
4.4.3. First Aid Organization.....	6
4.4.4. First aid kit.....	6
4.4.5. Stretcher.....	6
4.4.6. Ambulance.....	6
4.4.7. First aid room.....	7
4.4.8. First aid training.....	7
4.5. Workers: Recruitment and training.....	7
4.5.1. Recruitment.....	7
4.5.2. Training.....	7
4.6. Notes and Reports.....	8
5. Information and Investigation.....	8
5.1. General.....	8
5.2. Preliminary studies.....	9
5.2.1. Topography.....	9
5.2.2. Geology.....	9
5.2.3. Hydrology.....	9
5.2.4. Existing Buildings, Facilities, and Old Works.....	9
5.2.5. Weather.....	10
5.3. Special Field Study.....	10
5.3.1. Borehole.....	10
5.3.2. Continuous "probe" estimation.....	11
5.3.3. Geophysical Research.....	11
5.3.4. Topographic and Surface Surveys.....	11
5.3.5. Subsurface survey.....	12
5.3.6. Survey of the building structure above the tunnel.....	12
5.3.7. Groundwater testing.....	12
5.3.8. Gas.....	12
5.3.9. Soil Investigation During Construction.....	12
6. Planning for the unexpected.....	12
6.1. Assessment of the presence of danger.....	12
6.2. The need to review work methods.....	13
6.3. Types of Emergencies.....	13
6.4. Authority relationships.....	14
6.5. Priority.....	14
6.6. Emergency entrance.....	15
6.7. Backup equipment.....	15
7. Initial excavation and shoring.....	15
7.1. General.....	15
7.2. Basic principles.....	16
7.3. Soil Characteristics.....	16
7.3.1. The land has no cohesion.....	16
7.3.2. Sand and gravel.....	17
7.3.3. Cohesive soil.....	17
7.3.4. Clay.....	17
7.3.5. Silt.....	17
7.3.6. Chalk.....	18
7.3.7. Rock failure.....	18
7.4. Initial ground support method.....	18
7.5. Small tunnel head.....	18
7.5.1. General.....	18
7.5.2. Special.....	19
7.6. Small tunnel.....	19
7.6.1. General.....	19
7.6.2. Special.....	19
7.7. Tunneling Shield.....	20
7.7.1. General.....	20
7.7.2. The shield opens.....	21
7.7.2.1. General.....	21
7.7.2.2. Special.....	21
7.7.2.3. Cutter Booms.....	22
7.7.2.4. Jack Pipe.....	22
7.8. Compartment shield.....	22
7.8.1. General.....	22
7.8.2. Special.....	23
7.9. Soft soil drilling machine.....	23
8. Water Management.....	29
9. Permanent Buffer.....	32
10. Work With Compressed Air.....	35

APPENDIX A: LIST OF TERMS 42

APPENDIX B: List of Names and Institutions 43

LIST OF CONTENTS

LIST OF CONTENTS 1

1. Scope 1

2. Reference 1

3. Understanding 2

4. Types of Connections 3

5. Selection of Type and Material 3

6. Water Retaining Material Specifications 6

APPENDIX A: LIST OF TERMS 7

APPENDIX B: Tables 8

APPENDIX C: List of Names and Institutions 9

SNI

Indonesian National Standards

**Specifications for connection materials in concrete
dams - part 1 selection of water retaining
materials**

SNI 03-6416-1-2000

**National Standardization Boards
(BSN)**

LIST OF CONTENTS

1. Scope.....	1
2. Reference.....	1
3. Understanding.....	1
4. Shape and Dimensions	1
4.1. Form	1
4.2. Dimensions.....	1
5. Functions and Requirements.....	2
5.1. Function.....	2
5.2. Condition.....	3
6. Performance.....	3
APPENDIX A: LIST OF TERMS	3
APPENDIX B: Table.....	4
APPENDIX C: List of Names and Institutions	4

SNI

Indonesian National Standards

**Cipoletti discharge measuring building
specifications**

SNI 03-6381-2000

**National Standardization Boards
(BSN)**

LIST OF CONTENTS

CHAPTER I DESCRIPTION	1
1.1. Scope.....	1
1.1.1. Meaning.....	1
1.1.2. Terms and definitions	1
1.2. Scope.....	1
1.3. Understanding.....	1
CHAPTER II REQUIREMENTS	2
2.1. Material.....	2
2.2. Equipment.....	2
2.3. Implementation	2
CHAPTER III PROVISIONS	3
3.1. Material.....	3
3.1.1. Water.....	3
3.1.2. Cement.....	3
3.1.3. Aggregate	3
3.1.4. Additional Materials for Concrete.....	3
3.1.5. Air Bubble Forming Additives for Concrete	3
3.2. Equipment.....	3
3.3. Implementation	3
3.3.1. Preparation	3
3.3.2. Measuring.....	4
3.3.3. Stirring	4
3.3.4. Transportation	5
3.3.5. Casting and Compaction	5
3.3.6. Maintenance	6
3.3.7. Inspection.....	6
CHAPTER IV HOW TO WORK	7
CHAPTER V REPORTING	9
APPENDIX A: LIST OF TERMS	10
APPENDIX B: OTHERS	11

SNI

Indonesian National Standards

PROCEDURE FOR MIXING CONCRETE CASTING

SNI 03-3976-1995

**National Standardization Boards
(BSN)**

LIST OF CONTENTS

Minister of Public Works Decree Number:	i
List of contents	iii
Foreword	iv
Introduction	iv
1. Scope	1
2. Normative reference	1
3. Terms and definitions	1
4. Data and information	2
4.1. Map	2
4.2. Hydrological Data	2
4.2.1. Live stream data	2
4.2.2. Rain data	2
4.3. Geotechnical data and seismic zone maps	2
4.4. River geometry data	3
4.5. Building data	3
4.6. River morphology data	3
4.7. Building material data	3
5. Functions and requirements	4
5.1. The function of a sediment retaining weir	4
5.2. The function of the dam's completeness to retain sediment	4
5.2.1. Body bending	4
5.2.2. Overflow	4
5.2.3. Wing	4
5.2.4. Edge wall	4
5.2.5. Stilling pool floor	4
5.2.6. Drainage hole	4
5.3. Security and stability requirements	4
6. Terms	5
6.1. Layout	5
6.2. Shape and dimensions	5
6.2.1. The total length of the sediment retaining weir	5
6.2.2. Main weir	5
6.2.3. Sub weir	6
6.2.4. Stilling pool	7
6.2.5. Complementary buildings	7
6.3. The styles at work	7
7. Technical planning of sediment retaining weirs	7
7.1. Formulas and Equations	7
7.1.1. The formula for determining overflow dimensions	8
7.1.2. The equation to determine the slope of the main weir body	8
7.1.3. The formula for calculating stability	9
7.1.4. The formula for determining the critical path length	10
7.1.5. Formula to determine the length of a stilling pool	11
7.1.6. The formula for determining the thickness of a stilling pool floor	12
7.2. Test the hydraulic model	12
7.3. Hydraulic design	13
7.4. Structural design	13
Appendix A Flow diagram (normative)	14
Appendix B Images (informative)	16
Appendix C Tables (informative)	25
Appendix D Example of calculation (normative)	29
Appendix E List of names and institutions (informative)	50
Bibliography	51

SNI

Indonesian National Standards

Procedures for engineering planning for sediment retaining weirs

National Standardization Boards (BSN)

LIST OF CONTENTS

Minister of Public Works Decree Number:	1
List of contents	1
CHAPTER I DESCRIPTION	1
1.1. Purpose and Objectives	1
1.1.1. Meaning	1
1.1.2. Objective	1
1.2. Scope	1
1.3. Understanding	1
CHAPTER II REQUIREMENTS	2
2.1. Data and Information	2
2.2. Types of Engineering Geological Maps	2
2.3. Officer	3
CHAPTER III PROVISIONS	4
3.1. Location	4
3.2. Equipment and Supplies	4
3.3. Base Map	4
CHAPTER IV HOW TO WORK	6
4.1. Preparation	6
4.2. Mapping Stages	6
CHAPTER V ENGINEERING GEOLOGICAL MAPPING REPORT	8
APPENDIX A: LIST OF TERMS	9
APPENDIX B: MISCELLANEOUS	10
APPENDIX C: LIST OF NAMES AND INSTITUTIONS	29

Procedures

Field engineering geological mapping

National Standardization Board (BSN)

DAM SAFETY GUIDELINES

SKBI - 1.7.10. 1987

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LIST OF CONTENTS

Foreword	i-1
List of contents	i-2
Minister of Public Works Decree No. 378/KPTS/1987	i-8
A. GENERAL ASPECTS	1
CHAPTER 1 Introduction	1
Article 1 Purpose and Objectives	1
Article 2 Scope of Guidance	1
Article 3 Definition	1
CHAPTER 2 GENERAL PROVISIONS	4
Article 4 Commission	4
Article 5 Dam Owners and Managers	4
Article 6 Inspection Team	5
Article 7 Documentation	6
Article 8 Border Rivers	7
Article 9 Legal Aspects	8
Article 10 Updates to Regulations and Procedures	9
Article 11 Financing	9
B. DESIGN	9
CHAPTER 3 HYDROLOGY AND HYDRAULIC DESIGN	9
Article 12 Design Methods and Standards	9
Article 13 Design Flood Discharge	10
Article 14 Downstream Water Conditions	11
Article 15 Flooding Downstream	11
CHAPTER 4 STRUCTURAL DESIGN	12
Article 16 Methods, Standards and Design Plans	12
Article 17 Loads and Safety Factors	14
Article 18 Foundation Stability	14
Article 19 Building Deformation	14
Article 20 Deterioration of Material Quality	15
Article 21 Seepage	16
Article 22 Earthquake	16
CHAPTER 5 MONITORING	17
Article 23 Hydrological Observation System	17
Article 24 Structural Monitoring	17
Article 25 Seismic Monitoring	18
CHAPTER 6 RESERVOIR PLANNING AND DESIGN	18
Article 26 Flood Management	18
Article 27 Stability of Reservoir Cliffs	19
Article 28 Sedimentation in Reservoirs	19
Article 29 Floating Solid Objects	20
Article 30 Environmental Safety	20
Article 31 Flood Warning	21
CHAPTER 7 SAFETY INSPECTION INSTRUCTIONS	21
Article 32 Inspection Schedule	21
Article 33 Supervision Methods and Procedures	21
CHAPTER 8 EMERGENCY PLANS AND PROCEDURES	22
Article 34 Emergency Operation Plan	22
Article 35 Emergency Warning	22

CHAPTER 9 SECURITY ASPECTS OF DESIGN RELATING TO BORDER RIVERS.....	23
Article 36 Building Safety and Exploitation.....	23
Article 37 Coordination of Emergency Warning Systems.....	23
CHAPTER 10 PLANNING AND DESIGN FOR EXPANSION, ALTERATION, REHABILITATION, REPAIR AND REMOVAL OF DAM.....	24
Article 38 Design Procedures.....	24
Article 39 Design Principles and Standards.....	24
CHAPTER 11 DESIGN APPROVAL.....	25
Article 40 Original Design.....	25
Article 41 Design work to expand, change and repair dams.....	26
C. CONSTRUCTION EXECUTION.....	26
CHAPTER 12 CONSTRUCTION IMPLEMENTATION ASPECTS REGARDING DESIGN.....	26
Article 42 Construction Changes to Design.....	26
Article 43 Construction Methods and Equipment.....	27
Article 44 Construction Supervision and Inspection.....	27
CHAPTER 13 RIVER MANAGEMENT AND RESERVOIR FILLING.....	30
Article 45 River Avoidance.....	30
Article 46 First Filling of the Reservoir.....	31
CHAPTER 14 EMERGENCY PREVENTION MEASURES DURING CONSTRUCTION.....	32
Article 47 Prevention of Emergency Situations.....	32
Article 48 Observation and Notification of Emergency Situations.....	32
CHAPTER 15 PUBLIC HEALTH AND ENVIRONMENTAL RISKS.....	33
Article 49 Health Care.....	33
Article 50 Sanitary Measures.....	33
CHAPTER 16 CONSTRUCTION WORK FOR ALTERATION OR REPAIR OF EXISTING DAM AND RESERVOIRS.....	34
Article 51 Construction Activities.....	34
Article 52 Minor Repair Work.....	34
D. EXPLOITATION AND MAINTENANCE.....	35
CHAPTER 17 FLOOD DISCHARGE AND FLOOD CONTROL.....	35
Article 53 Flood Patterns and Reservoir Exploitation.....	35
Article 54 Flood Discharge.....	35
Article 54 Flood Warning and Flood Control.....	36
CHAPTER 18 STRUCTURAL STRENGTH AND OPERATIONAL SECURITY.....	37
Article 55 Building Loading and Deformation.....	37
Article 57 Visual Inspection of Dams.....	37
Article 58 Underwater Investigation.....	38
Article 59 Seepage and Drainage.....	39
Article 60 Electrical and Mechanical Equipment.....	39
Article 61 Foundations and Hill/Cliff Support.....	40
Article 62 Response to Earthquake Activities.....	41
CHAPTER 19 RESERVOIR EXPLOITATION AND ENVIRONMENTAL SAFETY.....	41
Article 63 Reservoir Exploitation Safety.....	41
Article 64 Environmental Safety Supervision.....	42
CHAPTER 20 MONITORING AND INSPECTION.....	43
Article 65 Monitoring by Dam Management.....	43
Article 66 Inspection.....	44
CHAPTER 21 PREVENTIVE MEASURES AND EMERGENCY OPERATIONS.....	45
Article 67 Preventive and Protective Measures.....	45

Article 68 Emergency Operation Requirements.....	47
Article 69 Coordination of Emergency Operations in DPS that cuts across Provincial/State Boundaries.....	48
CHAPTER 22 CLASSIFICATION OF VULNERABILITY; EVENTS AND DISASTERS.....	48
Article 70 Classification of the Vulnerability of Existing Dams.....	48
Article 71 Events and Disasters.....	49
E. DAM REMOVAL.....	49
CHAPTER 23 THE LEADING BUILDINGS.....	49
Article 72 Approval to Cease Activities.....	49
Article 73 Removal of Buildings.....	50
CHAPTER 24 RIVER FLOW AND FLOOD DISCHARGE.....	50
Article 74 Restoration of Natural Conditions.....	50
Article 75 Floods and Sedimentation Downstream.....	51

LIST OF CONTENTS

List of contents.....	i
Foreword.....	ii
Introduction.....	iii
1. Scope.....	1
2. Normative reference.....	1
3. Terms and Definitions.....	1
4. Loading conditions and safety factors.....	2
5. Shear strength of material.....	7
6. Calculation of pore water pressure.....	13
7. Slope Stability Analysis.....	14
Appendix A Determination of embankment material parameters for slope stability analysis.....	18
Appendix B Example of Jatibarang dam stability analysis (informative).....	19
Bibliography.....	28
Figure B.1 – Geological cross-section of the dam foundation.....	19
Figure B.2 – Foundation stratification based on field test parameters.....	19
Figure B.3 – Profile of the Jatibarang dam, Central Java assuming strong foundations.....	20
Figure B.4 – Gradation of impermeable core zones (1).....	20
Figure B.5 – Gradation of semi-impermeable zones (2).....	20
Figure B.6 – Chart pq of backfill material 1.....	21
Figure B.7 – P'-q graph of backfill material 1.....	21
Figure B.8 – P'-q graph of filter backfill material 2.....	21
Figure B.9 – Pq graph of filter backfill material 2.....	21
Figure B.10 – Relationship graph σ_3 with ϕ'	21
Figure B.11 – Results of village slope stability analysis after construction.....	23
Figure B.12 – Results of downstream slope stability analysis after construction.....	23
Figure B.13 – Results of village slope stability analysis for continuous flow conditions.....	24
Figure B.14 – Results of downstream slope stability analysis for continuous flow conditions.....	24
Figure B.15 – Results of stability analysis of village slopes under fast receding conditions.....	25
Figure B.16 – Types of hyperbolic model materials for stress-strain analysis.....	26
Figure B.17 – Mohr-Coulomb model material types for stress-strain analysis.....	26
Figure B.18 – Deformation of the element mesh until construction is complete.....	26
Table 1 – Requirements for minimum safety factors for the stability of embankment-type dams.....	6
Table 2 – Characteristics of soil as embankment and dam foundation material.....	9
Table 3 – Clay soil compaction parameters in Indonesia (NAJOAN 1990).....	10
Table 4 – Shear strength of clay embankments in Indonesia (NAJOAN 1990).....	10
Table 5 – Stability analysis using limit balance.....	15
Table 6 – Finite element programs that can be used for analysis.....	16
Table A.1 – Overview of testing of landfill materials to determine design parameters for stability analysis.....	18
Table B.1 – Gradation of rock fill zones.....	20
Table B.2 – Parameters used for slope stability analysis.....	22
Table B.3 – Results of Jatibarang Dam Slope Stability Analysis.....	22

SNI

Indonesian National Standards

Static Slope Stability Analysis Method for Embankment-

Type Dams

SNI 8064-2016

Backfill National Standardization Boards

(BSN)

IRRIGATION PLANNING STANDARDS

LIST OF CONTENTS

1. INTRODUCTION	
1.1. General	1
1.2. Validity/Validity and Limitations	3
1.3. Irrigation Network Levels	5
1.3.1. Network elements and levels	5
1.3.2. Simple Irrigation	8
1.3.3. Semi-technical irrigation network	9
1.3.4. Technical Irrigation Network	9
2. IRRIGATION NETWORK	
2.1. Introduction	13
2.2. Overview Plot	13
2.2.1 Tertiary Plot	14
2.2.2 Secondary Plot	15
2.2.3 Primary Plot	16
2.3. Building	16
2.3.1 Main building	16
2.3.2 Irrigation network	18
2.3.3 Building for and tapping	20
2.3.4 Measuring and regulating buildings	20
2.3.5. Water level control structures	22
2.3.6 Carrier building	23
2.3.7 Protected buildings	26
2.3.8 Roads and bridges	27
2.3.9 Additional buildings	28
2.4. Nomenclature Standards	28
2.4.1 Irrigation areas	29
2.4.2 Primary irrigation network	29
2.4.3 Nomenclature system	32
2.4.4 Waste network	34
2.4.5 Map color layout	35
2.5. Definition of irrigation areas	35
3. IRRIGATION PLANNING STAGES	
3.1. Introduction	39
3.2. Study Phase	44
3.2.1 Preliminary study	49
3.2.2 Identification study	50
3.2.3 Introduction study	51
3.2.4 Feasibility study	56
3.3. Planning stage	58
3.3.1 Preliminary planning stage	59
3.3.2 Final planning level	66
4. DATA, MEASUREMENTS AND INVESTIGATIONS FOR IRRIGATION PLANNING	
4.1. General	71
4.1.1 Data collection	71

PLANNING CRITERIA PART 1

IRRIGATION NETWORK

KP-1

IRRIGATION PLANNING STANDARDS

4.1.2	Data properties	72
4.1.3	Data accuracy	72
Hydrometeorology		
4.2.1	Data	73
4.2.2	Rainfall	75
4.2.3	Evapotranspiration	76
4.2.4	Flood plan	77
4.2.5	Mainstay discharge	79
Topographic Measurements		
4.3.1	Topographic map	81
4.3.2	River measurements and bending locations	83
4.3.3	Channel alignment map	85
4.3.4	Building location measurements	86
Engineering Geological Data		
4.4.1	Study stage	86
4.4.2	Detailed investigation	89
Building material		
4.5.	Hydraulic Model Investigation	91
4.6.	Farmland	92
4.7.	Farmland	94

CHAPTER V CLOSING

5.1.	Planning stages	97
5.1.1	Outline planning	97
5.1.2	Preliminary planning	98
5.1.3	Final planning	101
Water Balance Calculation		
5.2.1	Availability of water	105
5.2.2	Water requirements	105
5.2.3	Water balance	108
Layout		
5.3.1	Preliminary planning level	109
5.3.2	Final planning level	111
Channel Planning		
5.4.1	Preliminary planning level	112
5.4.2	Final planning level	122
Main Building Planning for the Weir		
5.5.1	Preliminary planning level	124
5.5.2	Final planning level	134

BIBLIOGRAPHY

ATTACHMENTS

LIST OF IRRIGATION TERMS

PLANNING CRITERIA

PART

MAIN BUILDINGS

KP-2

DECEMBER 1986

LIST OF CONTENTS

1. INTRODUCTION	
1.1. General.....	1
1.2. Definition.....	1
1.3. Validity/Validity.....	2
1.4. Irrigation Network Levels.....	2
1.4.1. Diversions building.....	4
1.4.2. Intake.....	7
1.4.3. Rinsing.....	7
1.4.4. Mud bag.....	9
1.4.5. River regulation work.....	9
1.4.6. Complementary work.....	10
2. DATA	
2.1. Introduction.....	11
2.2. Topographic data.....	12
2.3. Hydrological data.....	14
2.3.1 Flood discharge.....	14
2.3.2 Reliable low discharge.....	15
2.3.3 Water balance.....	16
2.4. Morphological Data.....	16
2.5. Technical Geological Data.....	17
2.5.1. Geology.....	17
2.5.2. Soil Mechanics Data.....	18
3. DIVERSIONS BUILDINGS	
3.1. General.....	19
3.2. River.....	19
3.2.1 River bed slope and bed material.....	20
3.2.2 River morphology.....	25
3.3. Water surface.....	28
3.4. Topography.....	29
3.5. Engineering Geological Conditions.....	29
3.6. Implementation method.....	29
3.7. Building Type.....	30
3.7.1 General.....	30
3.7.2 Water level control structures.....	32
3.7.3 Free water front buildings.....	33
4. HYDRAULIC PLANNING	
4.1. General.....	37
4.2. Overflow Dam.....	37
4.2.1 Weir width.....	37
4.2.2 Mercuri planning.....	40
4.2.3 Base of weir.....	52
4.2.4 Energy dissipation.....	53
4.2.5 Diving pool (Vlugter).....	56

4.2.6 Sink-type energy dissipation.....	61
4.2.7 Vlugter Pool.....	66
Stop the movement.....	66
4.3.1 Layout.....	66
4.3.2 Gates.....	67
4.4. Free Intake.....	69
4.5. Pump.....	72
4.6. Lower Filter Weir.....	77
5. COLLECTION AND RINNING BUILDINGS	
5.1. Layout.....	83
5.2. Intake Building.....	84
5.3. Rinsing.....	88
5.4. Bottom rinse.....	92
5.5. Gates.....	95
5.5.1 General.....	95
5.5.2 Collection gate.....	98
5.5.3 Rinse gate.....	99

6. BUILDING PLANNING

6.1. General.....	103
6.2. Use of special materials.....	103
6.2.1. Surface protection.....	103
6.2.2. Bare masonry protection.....	104
6.2.3. Filter.....	106
6.2.4. Gabions.....	108
6.3. Foundation Materials.....	109
6.4. Stability Analysis.....	111
6.4.1. Forces acting on buildings.....	111
6.4.2. Water pressure.....	111
6.4.3. Mud pressure.....	116
6.4.4. Earthquake force.....	117
6.4.5. Building Weight.....	117
6.4.6. Foundation reaction.....	118
6.5. Stability Needs.....	120
6.5.1 Slip resistance.....	120
6.5.2 Bolster.....	122
6.5.3 Stability against underground erosion (piping).....	124
6.6. Building Details.....	128
6.6.1 Retaining walls.....	128
6.6.2 Protection against Underground Erosion.....	130

7. MUD BAG PLANNING

7.1. Introduction.....	135
7.2. Sediment.....	136
7.3. Boundary conditions.....	137
7.3.1. Intake Building.....	137
7.3.2. Channel network.....	137
7.3.3. Topography.....	138
7.4. Mud Bag Dimensions.....	139
7.4.1. Mud bag length and width.....	140
7.4.2. Storage volume.....	143

IRRIGATION PLANNING STANDARDS

7.5. Cleaning	145
7.5.1. Hydraulic cleaning	145
7.5.2. Manual/mechanical cleaning	149
7.6. Checking the Functioning of Mud Bags	149
7.6.1. Deposition efficiency	149
7.6.2. Rinsing efficiency	152
7.7. Sludge Bag Layout, Flushing and Collection in Primary Channels	152
7.7.1. Layout	152
7.7.2. Rinsing	154
7.7.3. Primary channel retrieval	156
7.7.4. Flushing Channel	157
7.8. Building Planning	157
8. ARRANGEMENT OF THE RIVER AND COMPLETE BUILDINGS	
8.1. Protection Against Scour	159
8.1.1. River bed protection	159
8.1.2. River embankment protection	160
8.2. Embankment	164
8.2.1. Length and elevation	164
8.2.2. Axis direction	165
8.2.3. High Security	165
8.2.4. Cross section	166
8.2.5. Waster	167
8.3. River cut	168
9. INVESTIGATION OF HYDRAULIC MODELS	
9.1. General	171
9.2. Model investigation for the Diversions Building	172
9.2.1. Location and layout	172
9.2.2. River regulation work	172
9.2.3. Spillway bending lighthouse shape	175
9.2.4. Door bending motion and threshold bending	175
9.2.5. Stilling pool	176
9.2.6. Exploitation of motion weir doors	177
9.2.7. Picking and rinsing	177
9.2.8. Directional channels and mud pockets	178
9.3. Criteria for. Research with models	178
10. INVESTIGATION OF HYDRAULIC MODELS	
10.1. General	171
10.2. Implementation on the river	172
10.3. Implementation in a dry place	172
BIBLIOGRAPHY ATTACHMENTS	

PLANNING CRITERIA PART 3 CHANNEL KP-3

LIST OF CONTENTS

1. INTRODUCTION 1

2. IRRIGATION PLANNING DATA

2.1. Topographic Data..... 3

2.2. Plan capacity 4

2.2.1 Plan data..... 4

2.2.2 Water requirements in rice fields..... 5

2.2.3 Efficiency..... 6

2.2.4 Technical rotation (group system)..... 9

2.3. Geotechnical Data..... 10

2.4. Sediment Data..... 11

3. GROUND CHANNEL WITHOUT PAIR

3.1. Stable Channel Planning..... 13

3.2. Hydraulic Formulas and Criteria..... 15

3.2.1 Flow formula..... 15

3.2.2 Strickler roughness coefficient..... 16

3.2.3 Sedimentation..... 18

3.2.4 Erosion..... 19

3.3. Channel Cross Section..... 22

3.3.1 Geometry..... 22

3.3.2 Channel slope..... 23

3.3.3 Channel curvature..... 25

3.3.4 Guard height..... 26

3.3.5 Width of embankment..... 26

3.3.6 Land acquisition limits..... 27

3.4. Longitudinal Cut..... 29

3.4.1 Required water level..... 29

3.4.2 Longitudinal slope..... 31

4. COUPLE CHANNEL

4.1. Uses of Couple Channels..... 35

4.2. Types of couples..... 36

4.3. Hydraulic planning..... 39

4.3.1 Maximum speed..... 39

4.3.2 Roughness coefficient..... 40

4.3.3 Planning for subcritical flow..... 41

4.3.4 Channel curvature..... 42

4.3.5 Guard height..... 43

5. TUNNEL AND CLOSED CANALS

5.1. Usage..... 45

5.2. Form and hydraulic criteria..... 46

5.2.1 Tunnels..... 46

5.2.2 Closed channels..... 52

5.3. Hydraulic Planning..... 54

6. SEWER PLANNING DATA

6.1. Topographic Data..... 61

6.2. Plan Debit..... 61

6.2.1. Waste network..... 63

6.2.2. The need for wasters for rice plants..... 68

6.2.3. The need for waste for non-rice fields..... 71

6.2.4. Discharge discharge..... 72

6.3. Soil Mechanics Data..... 72

7. SEWER LINE PLANNING

7.1. Stable Sewer Channel Planning..... 75

7.2. Hydraulic Formulas and Criteria..... 76

7.2.1. Flow formula..... 76

7.2.2. Stickler hardness coefficient..... 77

7.2.3. Maximum permitted speed..... 78

7.2.4. Water level height..... 79

7.3. Sewer Line Cross Section..... 81

7.3.1. Geometry..... 81

7.3.2. The slope of the drain pipe..... 82

7.3.3. Curved drain pipe..... 82

7.3.4. High guard..... 83

**BIBLIOGRAPHY
ATTACHMENTS**

IRRIGATION PLANNING STANDARDS

LIST OF CONTENTS

1. INTRODUCTION	
1.1. Scope	1
2. DISCHARGE MEASURING BUILDING	
2.1. General	3
2.2. Wide threshold measuring tool	5
2.2.1 Type	5
2.2.2 Hydraulic planning	7
2.2.3 Flat bottom flume	9
2.2.4 Modular Limits	9
2.2.5 Amount of debit	11
2.2.6 Guess board	11
2.2.7 Debit table	12
2.2.8 Characteristics of wide threshold measuring instruments	13
2.2.9 Advantages of wide threshold measuring instruments	14
2.2.10 Weaknesses of wide threshold measuring instruments	14
2.2.11 Use of width threshold measuring instruments	14
2.3. Romijn measuring instrument	15
2.3.1 Types. Romijn measuring instrument	15
2.3.2 Hydraulic planning	17
2.3.3 Dimensions and standard discharge table	20
2.3.4 Guess board	21
2.3.5 Characteristics of the Romijn measuring instrument	21
2.3.6 Advantages of the Romijn measuring instrument	22
2.3.7 Disadvantages of the Romijn measuring instrument	22
2.3.8 Use of the Romijn measuring instrument	22
2.4. Crump-de Gruyter measuring instrument	23
2.4.1 Hydraulic planning	24
2.4.2 Characteristics of the Crump-de Gruyter measuring instrument	26
2.4.3 Advantages of the Crump-de Gruyter measuring instrument	27
2.4.4 Disadvantages of the Crump-de Gruyter measuring instrument	27
2.4.5 Use of the Crump-de Gruyter measuring instrument	27
2.5. Simple Tapping Pipe	27
2.5.1. The use of tapping pipes is simple	28
3. WATER LEVEL REGULATING BUILDINGS	
3.1. General	31
3.2. Scotch Beam Door	31
3.2.1 Hydraulic planning	32
3.2.2 The advantages of scotch beam doors	34
3.2.2 Weaknesses of scotch beam doors	34
3.3. Sliding door	34
3.3.1 Hydraulic planning	34
3.3.2 Advantages of the bottom flush door	35
3.3.3 Weaknesses	36
3.3.4 Radial doors	36

PLANNING CRITERIA

PART

BUILDING

KP-4

3.3.5 Advantages of radial doors.....	37
3.3.6 Disadvantages of radial doors.....	37
3.4. Mercu remains.....	38
3.4.1 Hydraulic planning.....	38
3.4.2 The advantages of permanent beacons.....	40
3.4.3 Weaknesses of fixed beacons.....	40
3.5. Trapezoidal control gap.....	40
3.5.1 Hydraulic planning.....	42
3.5.2 Advantages of trapezoidal control gap.....	43
3.5.3 Weaknesses of trapezoidal control gaps.....	44
3.6. Use of Water Level Control Buildings.....	44
4. PLANNING FOR DIVISION AND TAPING	
4.1. Share Building.....	47
4.2. Regulating Dam.....	47
4.3. Tapping Building.....	53
4.3.1 Secondary tapping structure.....	53
4.3.2 Tertiary tapping building.....	54
5. CARRIER BUILDING	
5.1. Introduction.....	57
5.2. Subcritical Group.....	57
5.2.1. Hydraulic Planning.....	57
5.2.2. loss due to friction.....	58
5.2.3. Energy loss in switching.....	59
5.2.5. Elbows and corners.....	63
5.3. Channel Switching Standard.....	66
5.4. Water tunnel.....	
5.4.1. General.....	67
5.4.2. Flow speed.....	69
5.4.3. Standard sizes.....	69
5.4.4. Minimum cover.....	72
5.4.5. Rectangular culvert.....	72
5.4.6. High energy losses for full-flow culverts.....	73
5.5. Siphon.....	
5.5.1 General.....	74
5.5.2 Flow velocity.....	76
5.5.3 Seal the pipe inlet.....	76
5.5.4. High loss of energy.....	76
5.5.5. Filter grille.....	78
5.5.6. Overflow.....	79
5.5.7. Siphon Bridge.....	79
5.6. Gutters and Flumes.....	
5.6.1 Cross section.....	80
5.6.2 Slope and speed.....	80
5.6.3 Transition.....	80
5.6.4. High guard.....	82
5.6.5. Material.....	82
5.7. Building Falls.....	
5.7.1 General.....	83
5.7.2 Controller section.....	83
5.7.3 Vertical plunge buildings.....	86

5.7.4. The building is tilted.....	88
5.8. Got Italics.....	
5.7.1 Transition.....	90
5.7.2 Carrier buildings.....	93
5.7.3 Unsteady flow.....	95
6. ROLLING POOL	
6.1. General.....	99
6.2. Diving pool.....	100
6.3. The stilling pool for the Froude number is between 2.5 and 4.5.....	102
6.4. Stilling pool for Froude number >4.5.....	104
6.5. Vlugter Pool.....	105
6.6. Bare masonry protection.....	106
6.6.1 Retaining walls.....	107
7. PROTECTED BUILDINGS	
7.1. General.....	111
7.2. Spillway.....	112
7.2.1. Channel length planning.....	114
7.2.2. Number method.....	116
7.2.3. Notes.....	118
7.2.4. Graphic Method.....	118
7.3. Overflow Siphon.....	121
7.3.1. Determination of dimensions.....	122
7.3.2. Cavitation.....	125
7.3.3. Types of overflow siphons.....	128
7.4. Automatic Overflow Gate.....	132
7.5. Drain Building.....	133
7.5.1. Description.....	133
7.5.2. Drain door planning.....	134
7.6. Checking the Functioning of Mud Bags.....	134
7.6.1. General.....	134
7.6.2. Siphon.....	135
7.6.3. Water tunnel.....	136
7.6.4. Overchute.....	138
7.6.5. Disposal groove.....	140
8. ROADS AND BRIDGES	
8.1. General.....	143
8.2. Inspection Road.....	144
8.2.1. Classification.....	144
8.2.2. Cross section.....	145
8.2.3. Trace.....	145
8.2.4. Implementation.....	147
8.2.5. Waster.....	153
8.3. Bridge.....	154
8.3.1. Type.....	154
8.3.2. Liberation.....	155
8.3.3. Superstructure.....	155
8.3.4. Foundations and piles.....	155
8.3.5. Free space.....	159

9. COMPLETE BUILDINGS

9.1. Embankment.....	161
9.1.1. Utility.....	161
9.1.2. Material.....	161
9.1.3. Trace.....	162
9.1.4. High Security.....	162
9.1.5. Top width.....	163
9.1.6. The mirth is talut.....	163
9.1.7. Embankment stability.....	164
9.1.8. Waster.....	166
9.1.9. Protection.....	167
9.2. Exploitation Facilities.....	167
9.2.1. Communication.....	167
9.2.2. Offices and staff housing.....	169
9.2.3. Hectometer benchmark.....	170
9.2.4. Name plate.....	170
9.2.5. Pasten board.....	171
9.2.6. Water level estimation board.....	171
9.2.7. Door.....	172
9.3. Other Buildings.....	173
9.3.1. Safety equipment.....	173
9.3.2. Washing place.....	174
9.3.3. Livestock bathing pool.....	174
9.4. Other Buildings.....	175
9.4.1. General.....	175
9.4.2. Barrier wall.....	175
9.4.3. Suitcase.....	177
9.4.4. Filter.....	178
9.4.5. Drain hole.....	180
9.4.6. Disposal groove.....	180

BIBLIOGRAPHY ATTACHMENTS

IRRIGATION PLANNING STANDARDS

PLANNING CRITERIA

PART

TERTIARY LAYOUT

KP-5

DECEMBER 1986

LIST OF CONTENTS

1. INTRODUCTION	
1.1. General.....	1
1.2. Background.....	1
1.3. Objective.....	3
1.4. Scope of These Planning Criteria.....	3
1.5. Applicability and Limitations.....	4
1.6. Terminology and Nomenclature (Nomenclature).....	5
1.6.1. Terminology.....	5
1.6.2. Nomenclature System.....	6
2. APPROACH TO THE PROBLEM	
2.1. Introduction.....	9
2.2. Planning Activities and Procedures.....	11
2.2.1. Preparation.....	11
2.2.2. Data collection and investigation.....	12
2.2.3. Preliminary Layout.....	13
2.2.4. Preliminary layout check.....	14
2.2.5. Detailed measurements.....	15
2.2.6. Detailed planning.....	15
2.2.7. Implementation.....	16
Links to Main Network Development Stages.....	16
2.3. Special considerations.....	18
2.4. 2.4.1. Attitudes towards tertiary plot development.....	18
2.4.2. Approach in the inventory stage.....	18
2.4.3. Approach in the planning stage.....	20
3. BASIC DATA	
3.1. Introduction.....	21
3.2. Topographic Mapping.....	21
3.3. Pictures of existing Network Planning and Post-Implementation.....	23
3.4. Inundation and drought that occur regularly.....	24
3.5. Distribution of water in tertiary plots.....	24
4. TERTIARY PLOT LAYOUT	
4.1. Introduction.....	27
4.2. Ideal Tertiary Plot.....	28
4.3. Size and Shape of Tertiary and Quaternary Plots.....	30
4.4. Plot Boundaries.....	33
4.5. Identify areas that are not irrigated.....	33
4.6. Channel Trace.....	35
4.6.1. Irrigation Channels.....	35
4.6.2. Sewer.....	36
4.7. Road Network Layout.....	37
4.8. Layout in various types of terrain.....	38
4.8.1. Layout on steep terrain.....	39
4.8.2. The layout on the terrain is quite steep.....	43

4.8.3. Layout on bumpy terrain.....	45
4.8.4. Layout on flat terrain.....	47
4.9. Fish pond.....	49
4.10. Completed checking and settlement.....	53
4.10.1. Completed preliminary layout.....	53
4.10.2. Field check.....	53
5. CHANNEL PLANNING	
5.1. Introduction.....	55
5.2. Irrigation Channels.....	56
5.2.1. Irrigation water requirements.....	56
5.2.2. Plan capacity.....	58
5.2.3. Design water level elevation.....	59
5.2.4. Channel characteristics.....	63
5.2.5. Quaternary irrigation/waste channels.....	66
5.3. Exhaust duct.....	68
5.3.1. Waste modulus.....	69
5.3.2. Plan debit.....	70
5.3.3. Excess irrigation water.....	72
6. SHARE BOX	
6.1. General.....	79
6.2. Flexibility.....	81
6.3. Threshold.....	83
6.4. Door.....	90
7. PLANNING OF COMPLETE BUILDINGS	
7.1. Introduction.....	93
7.2. Water tunnel.....	94
7.3. Building falls.....	97
7.4. Gutter.....	100
7.5. Siphon.....	100
7.6. Partner.....	102
7.7. Got Italics.....	107
7.8. Road.....	111
7.9. Final Building.....	114
8. ARRANGEMENT OF THE RIVER AND COMPLETE BUILDINGS	
8.1. Picture.....	117
8.2. Explanatory Note.....	120
8.3. E&P Manual.....	120

BIBLIOGRAPHY ATTACHMENTS

IRRIGATION PLANNING STANDARDS

LIST OF CONTENTS

1. INTRODUCTION

1.1. General 1
 1.2. SI System 1
 1.3. Requirements and Code of Practice 2

2. DATA

2.1. Material Requirements 3
 2.2. Properties of Building Materials 3
 2.2.1. Volume Weight 4
 2.3. Land 4
 2.3.1 Soil classification system according to the Unified Soil Classification System 4
 2.3.2 Slope stability 7
 2.3.3 Bearing capacity of subsoil for foundations 12
 2.3.4. Subgrade subsidence 15

3. STRETCH THE PLAN

3.1. Burden 17
 3.1.1. Dead load 17
 3.1.2. Live load 21
 3.2. Earth pressure and mud pressure 21
 3.2.1 Earth pressure 21
 3.2.2 Mud pressure 24
 3.3. Water pressure 25
 3.3.1. Hydrostatic pressure 25
 3.3.2. Hydrodynamic pressure 26
 3.3.3. Seepage 27
 3.4. Loads due to earthquakes 32
 3.5. Loading combination 37
 3.6. Permissible stress and safety factor 38
 3.6.1. Permissible voltage 38
 3.6.2. Safety factor 39

4. HYDRAULIC PLANNING

4.1. General 41
 4.2. Rock 41
 4.3. Mortel 43

5. CONCRETE

5.1. Classification 45
 5.2. Concrete properties 47
 5.3. Reinforcement 47
 5.4. Reinforced Concrete Limit Strength Analysis 48
 5.4.1. Notation 49
 5.4.2. Use of charts for planning 51
 5.4.3. Limitation 55

BIBLIOGRAPHY

PLANNING CRITERIA

PART

BUILDING PARAMETERS

KP-6

IRRIGATION PLANNING STANDARDS

PLANNING CRITERIA
PART
DEPICTION STANDARDS
KP-7

DECEMBER 1986

LIST OF CONTENTS

1. INTRODUCTION.....	1
2. IMAGE PAPER SIZE.....	3
3. TITLE BLOCK.....	5
4. IMAGE NUMBERING.....	7
5. IMAGE REDUCTION.....	11
6. IMAGE DIRECTIONS.....	13
7. SCALE, LINE THICKNESS, HEIGHT OF LETTERS AND NUMBERS.....	15
8. SIZES AND INDICATIONS.....	19
9. SYMBOLS, SHARE, AND ABBREVIATIONS.....	23
10. DRAWINGS FOR CANALS, WATER AND DIMCHES.....	27
11. MAP COLOR SYSTEM.....	37
12. IMAGE FOLDING.....	39

BIBLIOGRAPHY
ATTACHMENTS

FLOOD MANAGEMENT
GUIDELINES

1987

LIST OF CONTENTS

FOREWORD
LIST OF CONTENTS
CHAPTER I INTRODUCTION

1.1. General.....	1
1.2. Floods and Disasters	1

CHAPTER II. GENERAL REQUIREMENTS

2.1. Terms and Definitions	4
2.2. Flood Management Organization.....	5

CHAPTER III. PREPARATION FOR THE FLOOD SEASON

3.1. Inventory, maintenance and repair of flood control buildings	7
3.2. Flood forecasting and reporting.....	11
3.2.1 Flood Forecasting	11
3.2.2 Flood Reporting	12
Countermeasure planning	14
3.3. 3.3.1 Identification of Hazard Areas.....	14
3.3.2 Planning for Materials, Equipment and Supplies.....	16
3.3.3 Energy Requirements Planning	16
3.3.4 Countermeasure Implementation Planning	17

CHAPTER IV. FLOOD MANAGEMENT

4.1. Flood Picket	18
4.2. Response Coordination	20
4.3. Coping Techniques.....	20
4.3.1 Runoff Management.....	21
4.3.2 Seepage Mitigation.....	22
4.3.3 Crack Prevention	25
4.3.4 Countermeasures for subsidence of Mercur Embankment.....	26
4.3.5 Scour Mitigation.....	27
4.3.6 Landslide Prevention.....	28
4.3.7 Anti-Breaking.....	30

CHAPTER V. IMPROVING COUNTERMEASURES

5.1. Building Damage Repair.....	33
5.2. Funding.....	33

ATTACHMENTS.....**35**
BIBLIOGRAPHY**46**

IRRIGATION PLANNING MANUAL

SUPPORTING PART FOR IRRIGATION PLANNING
STANDARDS

DECEMBER 1986

LIST OF CONTENTS

FOREWORD

LIST OF CONTENTS

CHAPTER I INTRODUCTION

1.1. Background.....	1
1.2. Objective.....	1
1.3. Approach.....	2
1.4. Validity and Limitations.....	3

CHAPTER II. IRRIGATION NETWORK

2.1. Water Balance.....	5
2.1.1. General.....	5
2.1.2. Irrigation water requirements.....	5
2.1.3. Availability of water.....	17
2.1.4. Plan Debit.....	21
Flood Plans.....	23
2.2.1. General.....	23
2.2.2. Melchior Method.....	40
2.2.3. Der Weduwen flood formula.....	45
Preliminary layout.....	48
2.3.1. General.....	48
2.3.2. Stage I Preliminary Layout Planning Steps.....	48
2.3.2. Stage II Preliminary Layout Planning Steps.....	49
2.3.2. Things to pay attention to in the first stage.....	50

CHAPTER III. MAIN BUILDING

3.1. General.....	55
3.1.1. Required data.....	55
3.1.2. Weir location.....	58
3.1.3. Selection of weir type.....	59
3.1.4. Elevation of the weir lighthouse.....	59
Mud bag.....	60
3.2.1. Planning pieces.....	60
3.2.2. Required data.....	63
3.2.3. Mud bag.....	63
3.2.4. Draining Building.....	71
3.2.5. Draining Channel.....	73
3.2.6. Primary channel intake building.....	75
3.3. Intake and Drain Building.....	76
3.3.1. Intake Building.....	76
3.3.2. Drain Building.....	79
Bend Body.....	80
3.4.1. Mercu Bending.....	80
3.4.2. Stilling Pool.....	84
3.4.3. Seepage and groundwater pressure.....	87
3.4.4. Weir Stability.....	90

CHAPTER IV. CHANNEL

4.1. General.....	107
4.1.1. Required Data.....	107
4.1.2. Steps for planning Irrigation Channels.....	108
4.1.3. Sewerage Planning Steps.....	109
Irrigation Channels.....	110

4.2.1. Channel Trace.....	110
4.2.2. Tapping building location.....	112
4.2.3. The water level required for tapping buildings.....	113
4.2.4. Plan Debit.....	116
4.2.5. Determination of terrain slope.....	117
4.2.6. Existing slope (I ₀).....	119
4.2.7. Planned slope.....	120
4.2.8. Planned water level.....	122
4.2.9. Channel dimensions.....	125
4.2.10. Checking traces in the field.....	127
Detailed Planning of Irrigation Channels.....	128
4.3.1. Investigation.....	128
4.3.2. Trace.....	129
4.3.3. Longitudinal and Transverse Sections.....	129
Preliminary Planning of Sewer Channels.....	131
4.4.1. Trace.....	131
4.4.2. Internal waster.....	133
4.4.3. External waster.....	139

CHAPTER V. BUILDING

5.1. Measuring instrument.....	147
5.1.1. Controller Part.....	147
5.1.2. Energy Dissipation.....	153
5.2. Diversions and Intake Building.....	156
5.2.1. Data.....	156
5.2.2. Layout.....	157
5.2.3. Selection of measuring and regulating tools.....	157
5.2.4. Planned water level for tapping Structures.....	158
5.2.5. Tap Building.....	159
5.2.6. Regulatory Building.....	162
Siphon.....	163
5.3.1. Data.....	163
5.3.2. Transverse double (wet area of siphon pipe).....	164
5.3.3. Longitudinal profile.....	165
5.3.4. Hydraulic Calculations.....	167
5.4. Side spillway.....	169
5.5. Gutter.....	173
5.6. Drop Structure.....	175
5.6.1. Controller section.....	175
5.6.2. Carrying part (irrigation).....	181
5.6.3. Stilling basin for rectangular sloping drop structure.....	181
5.7. Embankment Slope Stability.....	185

CHAPTER VI. TERTIARY LAYOUT

6.1. General.....	191
6.2. Data.....	191
6.3. Channel layout and trace.....	192
6.4. Irrigation Channels.....	195
6.4.1. Water face.....	195
6.4.2. Dimensions.....	198
6.5. Drain Channel.....	202
6.6. Diversions box.....	204

6.7	Building (system)	206
	6.7.1. Water Tunnel.....	206
	6.7.2. Drop Structure	207
	6.7.3. Gutter.....	210
	6.7.4. Masonry	213
	6.7.5. Titled Gutter	214

IRRIGATION PLANNING STANDARDS

TECHNICAL REQUIREMENTS

PART

IRRIGATION NETWORK

PLANNING

PT-01

GEO TECHNICAL

INVESTIGATIONS

PT-03

HYDRAULIC MODEL

INVESTIGATION

PT-04

DECEMBER 1986

PART PT - 03 GEOTECHNICAL INVESTIGATIONS

LIST OF CONTENTS

1. GENERAL	
1.1. Objective.....	2
1.2. Scope.....	2
1.3. Experts needed.....	2
1.4. Tender Images.....	3
1.5. General Information for Tender Participants.....	4
1.6. Field Inspection.....	4
1.7. Pegging.....	4
1.8. Program.....	4
1.9. Staff.....	5
1.10. Accommodation and Warehouse.....	5
1.11. Volume and Cost Details (bill of quantities).....	5
1.12. Transportation includes Mobilization and Demobilization of Personnel, Materials and Equipment.....	5
1.13. Equipment.....	6
1.14. Soil and Rock Mechanics Laboratory.....	6
1.15. Subcontracting.....	6
1.16. Reporting Requirements.....	6
2. RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER	
2.1. Surface Geological Mapping.....	8
2.2. Drilling.....	9
2.3. Groundwater Measurement Records.....	12
2.4. Standard Penetration Test (SPT).....	12
2.5. Permeability Test.....	14
2.6. Packer and Pressure Test.....	15
2.7. Open End Experiment.....	17
2.8. Soil Sampling.....	19
2.9. Test Well.....	20
2.10. Test Trench.....	22
2.11. Adit (a horizontal passage leading into a mine for the purposes of access or drainage).....	22
2.12. Penetration Attempt.....	23
2.13. Hand Drilling.....	24
2.14. Geolistic Research Methods.....	25
2.15. Placement of Concrete Stakes.....	26
3. PRELIMINARY PLANNING	
3.1. Foundation Research.....	27
3.2. Backfill Material Research.....	28
3.3. Concrete Material Research.....	28
3.4. Rock Research.....	29
3.5. Experimental Method.....	29
3.6. Soil Material Testing.....	29
3.7. Examples of Disturbed Land.....	30
3.8. Soil Test Methods and Requirements.....	31
3.9. Sand and Gravel Materials.....	31
3.10. Testing of Sand and Gravel Materials.....	32

PART PT - 01 IRRIGATION NETWORK PLANNING

LIST OF CONTENTS

1. JOB OVERVIEW	
1.1. Scope of work.....	1
1.2. Planning Procedures.....	1
1.3. Basic Planning.....	1
1.4. Data Available.....	2
1.5. Energy Requirements.....	2
1.6. Subcontracting.....	2
1.7. Etc.....	3
2. RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER	
2.1. Preliminary Planning Report.....	4
2.2. Report on Detailed Measurements and Investigations.....	4
2.3. Planning Report.....	5
2.4. Other Reports.....	6
3. PRELIMINARY PLANNING	
3.1. Topographic Measurements.....	8
3.2. Soil Capability Research.....	8
3.3. Final Layout.....	8
3.4. Initial Planning of Channels and Related Buildings.....	9
3.5. Hydrological Analysis and Water Balance Evaluation.....	10
3.6. Detailed Investigation and Measurement Program.....	10
4. MEASUREMENT AND INVESTIGATION OF DETAILS	
12	
5. DETAILED PLANNING	
5.1. General.....	13
5.2. Irrigation and Waste Channels.....	13
5.3. Building.....	14
5.4. Main Building.....	14

**PART PT - 04 INVESTIGATION OF HYDRAULIC
MODELS
LIST OF CONTENTS**

4. REPORTING	
4.1. Contents of the report	33
4.2. Conclusions and Recommendations	33
4.3. Attachment	33
5. EXAMPLE OF TENDER SUBMISSION	
5.1. Proposed Price	35
1. GENERAL DESCRIPTION	
1.1. Objective	1
1.2. Job functions to be investigated	1
2. PURPOSE	
2.1. Reason for conducting the investigation	2
2.2. Expected results	2
3. SCOPE	3
4. INVESTIGATION	
4.1. Data collection and review	4
4.2. Hydraulic Model	6
4.3. Hydraulic research with models	9
5. EXAMPLE OF TENDER SUBMISSION	12
6. SUPERVISION	13
7. REPORTING	14

IRRIGATION PLANNING STANDARDS

CONTENTS

PART I	VERTICAL AERIAL SHOOTING
PART II	CREATION OF ORTHOPHOTO MAP
PART III	PHOTOGRAMMETRIC LINE MAP
PART IV	TERRESTRIAL SITUATION MAPPING SCALE 1: 5,000
PART V	TERRESTRIAL SITUATION MAPPING SCALE 1: 2,000
PART VI	RIVER AND WEIR MEASUREMENT
PART VII	SITUATIONAL SYSTEM CHANNEL TRACE MEASUREMENT
PART VIII	IP SITUATION SYSTEM CHANNEL TRACE MEASUREMENT
PART IX	TERTIARY CHANNEL TRACE MEASUREMENT
PART X	MEASURING THE SITUATION OF SPECIFIC BUILDING LANDS

IRRIGATION PLANNING STANDARDS

TECHNICAL REQUIREMENTS

PART TOPOGRAPHIC MEASUREMENTS PT-02

PART I
VERTICAL AERIAL SHOOTING

LIST OF CONTENTS

1. JOB OVERVIEW

1.1. Scope of work.....1

1.2. Planning Procedures.....1

1.3. Basic Planning.....1

1.4. Data Available.....2

1.5. Energy Requirements.....2

1.6. Subcontracting.....2

1.7. Etc.....3

2. RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER

2.1. Preliminary Planning Report.....4

2.2. Report on Detailed Measurements and Investigations.....4

2.3. Planning Report.....5

2.4. Other Reports.....6

3. PRELIMINARY PLANNING

3.1. Topographic Measurements.....8

3.2. Soil Capability Research.....8

3.3. Final Layout.....8

3.4. Preliminary planning of channels and related buildings.....9

3.5. Hydrological Analysis and Water Balance Evaluation.....10

3.6. Detailed Investigation and Measurement Program.....10

4. MEASUREMENT AND DETAILED INVESTIGATION.....12

5. PRELIMINARY PLANNING

5.1. General.....13

5.2. Irrigation and Waste Channels.....13

5.3. Building.....14

5.4. Main Building.....14

PART II
CREATION OF ORTHOPHOTO MAP

LIST OF CONTENTS

1. JOB OVERVIEW

1.1. Scope of work.....1

1.2. Survey Base.....1

1.3. General.....1

2. RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER 3

3. GROUND CONTROL POINT

3.1. General.....4

3.2. Pillar Installation.....4

4. Controls for Air Triangulation.....8

4. MEASUREMENT METHODS IN THE FIELD

4.1. Polygon Measurement.....1

2

4.1.1. Polygon control: General.....1

2

4.1.2. Horizontal corners.....1

2

4.1.3. Vertical Angle.....1

3

4.1.4. Azimuthal Observation.....1

3

4.1.5. Distance Measurement.....1

4

4.1.6. Polygon measurement accuracy.....1

4

4.2. Flat setup.....5

4.2.1. General.....5

4.2.2. Accuracy of flat surface measurements.....6

4.3. High Point Measurement.....6

4.3.1. Detailed measurements: Method.....1

6	4.3.2. Detailed height measurements: Position	1
8		
	4.3.3. Accuracy of height details	2
1	Recording, Reducing, and Processing Observation Results in the Field	2
1	4.4.1. Recording	2
1	4.4.2. Reduction	2
2		
2	4.4.3. Processing	2
2		

5. PHOTO SELECTION FOR AIR TRIANGULATION AND ORTHOPHOTOS

24	PRODUCTION PURPOSES
5.1	General
4	Diagram of Aerial Photo Selection Results
4	

6. AIR TRIANGULATION

6.1	Printing and Diapositive	2
6	Selection of Model Points and Marking (Preparation)	2
6	Control Point Relocation and Marking	2
7	Preparation Diagram	2
8	Photogrammetric Observations	2
9	Block Adjustment	2
9		

7. ORTHOPHOTO PROCESSING AND ORTHOPHOTO MAP ASSEMBLY

35	
----	--

7.1	Definition	3
5		
7.2	Equipment and Materials	35
7.3	Processing	35
7.4	Orthophoto Accuracy Checking	36
7.5	Orthophoto map assembly	37

8. OVERVIEW OF HIGH-POINT INFORMATION AND CARTOGRAPHIC

CONDITIONS

8.1	High Point Information	40
8.2	Detailed Points and Contour Overlay and Photogrammetric Contours	41
8.3	Fine Delineation of Detailed Points and Contours	43
8.4	Writing Names, Benchmarks, and Grids	44
8.5	Supervision	45

**PART III
PHOTOGRAMMETRIC LINE
MAP**

LIST OF CONTENTS

1. JOB OVERVIEW

2. TECHNICAL REQUIREMENTS FOR MEASUREMENT OF CONTROL POINTS FOR VERTICAL AND HORIZONTAL CONTROL POINTS	1
2.1. Purpose and Objectives	
2.2. Measurements to Obtain Horizontal Data	
2.3. Measurements to Obtain Vertical Data	
2.4. Data Logging	
2.5. Concrete Stakes (BM)	
2.6. Work Supervision	

3. PHOTOGRAMMETRIC MAPPING WORK

3.1. Job volume	
3.2. Photogrammetric Map	
3.3. Input Medium	
3.4. Map Scale and Contour Intervals	
3.5. Work Phase	

4. PHOTOGRAMMETRIC MAPPING REQUIREMENTS

4.1. Data collection	
4.2. Implementation Stages	
4.3. Scope of Interpretation Work	

5. CARTOGRAPHIC REQUIREMENTS IN THE IMPLEMENTATION OF MAP DRAWING

- 5.1 Activities before plotting
- 5.2 Activities after plotting
- 5.3 Line Map Final Product Approval

14

5. DESCRIPTION

16

6. ACCURACY OF DEPICTION

18

7. WORK SUPERVISION..... 19

**PART IV
TERRESTRIAL SITUATION MAPPING 1:5000 SCALE**

LIST OF CONTENTS

1. JOB OVERVIEW

- 1.1. Job Linkup Space
- 1.2. Survey Base
- 1.3. General

LIST OF CONTENTS

1. GENERAL EXPLANATION

- 1.1. Job Purpose
- 1.2. Scope of work
- 1.3. Job Location
- 1.4. Job volume
- 1.5. Reference Point
- 1.6. Equipment
- 1.7. Measure Book
- 1.8. Benchmarks
- 1.9. Report

2. RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER 3

3. GROUND CONTROL POINT

- 3.1. General
- 3.2. Pillar Installation

4. MEASUREMENT METHODS IN THE FIELD

- 4.1. Polygon Measurement
- 4.2. Flat Folding
- 4.3. Detailed Situation Measurement
- 4.4. Recording, Reducing, and Processing Field Observation Results

**PART V
TERRESTRIAL SITUATION MAPPING 1:2000 SCALE**

1.10.	Work implementation	3
2. TECHNICAL REQUIREMENTS FOR WORK IMPLEMENTATION		
2.1.	Installation of Benchmark Stake (BM)	4
2.2.	Polygon measurements (Main and Branch)	4
2.3.	Flat Sipat Measurement (Waterpass)	6
2.4.	Detailed Situation Measurement	7
2.5.	Calculation	7
2.6.	Accuracy of depiction	8
2.7.	Depiction	9
2.8.	Results and data must be submitted to the Employer	10
4.4.	Recording, Reducing, and Processing Observation Results in the Field	16
5. OVERVIEW OF HIGH POINT INFORMATION		
5.1	High Point Information	18
5.2	Fine Delineation of Detailed Points and Contours	19
5.3	Writing Names, Benchmarks, and Grids	19
5.4	Supervision	20
6. DRAWING OF A TOPOGRAPHIC MAP, CROSS-CUTTING, AND LONGITUDINAL THE RIVER		
6.1	Topographic maps	21
6.2	Cross Section	21
6.3	Longitudinal Cut	22
7.	WORK SUPERVISION	23

PART VII
SITUATIONAL SYSTEM CHANNEL TRACE MEASUREMENT

LIST OF CONTENTS

1.	JOB OVERVIEW	1
1.1.	Scope of work	1
1.2.	Survey Base	1
1.3.	General	1

PART VI
RIVER MEASUREMENT AND WEIR LOCATION

LIST OF CONTENTS

1.	JOB OVERVIEW	1
4.1.	Scope of work	1
4.2.	Survey Base	1
4.3.	General	1
2.	RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER	3
3.	INSTALLATION OF CONCRETE STICKS	4
4.	MEASUREMENT METHODS IN THE FIELD	8
4.1.	Polygon Measurement	11
4.2.	Flat Folding	11
4.3.	Topographic Measurements	12

2.	RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER	3
3.	INSTALLATION OF CONCRETE STICKS	4
4.	MEASUREMENT METHODS IN THE FIELD	9
4.1.	Polygon Measurement	12
4.2.	Flat Folding	12
4.3.	Topographic Measurements	13
4.4.	Recording, Reducing, and Processing Observation Results in the Field	13

.....	17
5. OVERVIEW OF HIGH POINT INFORMATION	
5.1 High Point Information.....	19
5.2 Fine Delineation of Detailed Points and Contours.....	20
5.3 Writing Names, Benchmarks, and Grids.....	20
5.4 Supervision.....	21
6. DRAWING OF A TOPOGRAPHIC MAP, CROSS-CUTTING, AND LONGITUDINING THE RIVER	
6.1 Topographic maps.....	22
6.2 Cross Section.....	23
6.3 Longitudinal Cut.....	23
7. WORK SUPERVISION.....	24

**PART VIII
IP SYSTEM CHANNEL TRACE MEASUREMENT**

LIST OF CONTENTS	
1. GENERAL EXPLANATION	
1.1. Job Purpose.....	1
1.2. Scope of work.....	1
1.3. Job Location.....	1
1.4. Reference Point.....	1
1.5. Equipment.....	2
1.6. Measure Book.....	2
1.7. Report.....	2
1.8. Work implementation.....	2
2. TECHNICAL REQUIREMENTS FOR WORK IMPLEMENTATION	

2.1. Installation of Benchmarks (BM) and Wooden Stakes.....	3
2.2. Search.....	3
2.3. Polygon Measurement.....	4
2.4. Solar Azimuth Measurement.....	4
2.5. Water pass Measurement.....	5
2.6. Measurement of longitudinal and transverse sections.....	5
2.7. Detailed Situation Measurement.....	6
2.8. Calculation.....	6
2.9. Accuracy of depiction.....	7
2.10. Depiction.....	7
2.11. Results must be submitted.....	8

**PART IX
TERTIARY CHANNEL TRACE MEASUREMENT**

LIST OF CONTENTS	
1. TERTIARY TISSUE MEASUREMENT.....	1
1.1. Tertiary channel trace measurements.....	1

IRRIGATION PLANNING STANDARDS

1.2.	Polygon measurement	1
1.3.	Flat folding.....	2
1.4.	Cross-sectional measurements.....	2
1.5.	Tertiary channel trace topography measurements.....	3
2.	CALCULATION AND DRAWING.....	4
2.1.	Calculation.....	4
2.2.	Depiction.....	4
3.	TOPOGRAPHIC MAP AND DRAWING OF CHANNEL TRAINS.....	6
4.	RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER.....	7

PART X

MEASUREMENT OF SPECIAL BUILDING LAND SITUATIONS

LIST OF CONTENTS

1.	JOB OVERVIEW	1
1.1.	Scope of work.....	1
1.2.	Survey base.....	1
1.3.	General	1
2.	RESULTS AND DATA THAT MUST BE SUBMITTED TO THE EMPLOYER.....	3
3.	BENCHMARK INSTALLATION.....	4
4.	FIELD MEASUREMENT METHODS	8
4.1.	Polygon measurement	8
4.2.	Leveling measurement.....	9
4.3.	Measuring the situation of planning irrigation building locations	11
5.	DEPICTION	16
5.1.	High point information.....	16
5.2.	Exemplary depiction of point contour details	16
5.3.	Writing benchmark and grid names	17
5.4.	Supervision.....	17
6.	DRAWING OF TOPOGRAPHICAL MAP OF BUILDING PLAN LOCATION, LONGITUDE, AND TRANSVERSE SECTIONS.....	19
6.1.	Longitudinal cut.....	19
6.2.	Cross section	20

IRRIGATION PLANNING STANDARDS PLANNING CRITERIA PART 1 IRRIGATION NETWORK KP-1

LIST OF CONTENTS

1. INTRODUCTION	
1.1. General	1
1.2. Validity/Validity and Limitations	3
1.3. Irrigation Network Levels	5
1.3.1. Network elements and levels	5
1.3.2. Simple Irrigation	8
1.3.3. Semi-technical irrigation network	9
1.3.4. Technical Irrigation Network	9
2. IRRIGATION NETWORK	
2.1. Introduction	13
2.2. Overview Plot	13
2.2.1 Tertiary Plot	14
2.2.2 Secondary Plot	15
2.2.3 Primary Plot	16
2.3. Building	16
2.3.1 Main building	16
2.3.2 Irrigation network	18
2.3.3 Building for and tapping	20
2.3.4 Measuring and regulating buildings	20
2.3.5. Water level control structures	22
2.3.6 Carrier building	23
2.3.7 Protected buildings	26
2.3.8 Roads and bridges	27
2.3.9 Additional buildings	28
2.4. Nomenclature Standards	28
2.4.1 Irrigation areas	29
2.4.2 Primary irrigation network	29
2.4.3 Nomenclature system	32
2.4.4 Waste network	34
2.4.5 Map color layout	35
2.5. Definition of irrigation areas	35
3. IRRIGATION PLANNING STAGES	
3.1. Introduction	39
3.2. Study Phase	44
3.2.1 Preliminary study	49
3.2.2 Identification study	50
3.2.3 Introduction study	51
3.2.4 Feasibility study	56
3.3. Planning stage	58
3.3.1 Preliminary planning stage	59
3.3.2 Final planning level	66
4. DATA, MEASUREMENTS AND INVESTIGATIONS FOR IRRIGATION PLANNING	
4.1. General	71

4.1.1 Data Collection	71
4.1.2 Data Properties	71
4.1.3 Data accuracy	72
Hydrometeorology	73
4.2.1 Data	73
4.2.2 Rainfall	74
4.2.3 Evapotranspiration	75
4.2.4 Flood Plan	76
4.2.5 Mainstay discharge	78
Measurements	80
4.3.1 Topographic Measurement	80
4.3.2 River measurements and weir locations	82
4.3.3 Trace Channel Measurement	83
4.3.4 Building Location Measurements	84
Engineering Geological Data	84
4.4.1 Study Stage	84
4.4.2 Detailed investigation	87
4.5. Building material	88
4.6. Hydraulic Model Investigation	90
4.7. Farmland	91
CHAPTER V ENGINEERING	95
5.1. Planning Stages	95
5.1.1 Outline Planning	95
5.1.2 Preliminary Planning	96
5.1.3 Final Planning	99
5.2. Water Balance Calculation	101
5.2.1 Availability of water	102
5.2.2 Water Requirements	103
5.2.3 Water balance	105
5.3. Layout	106
5.3.1 Preliminary Planning Level	106
5.3.2 Final Planning Level	109
5.4. Channel Planning	109
5.4.1 Preliminary Planning Level	109
5.4.2 Final Planning Level	119
5.5. Main Building Planning for Fixed Weirs, Moving Weirs and Rubber Weirs	121
5.5.1 Preliminary Planning Level	121
5.5.2 Final Planning Level	131

BIBLIOGRAPHY	133
APPENDIX I EMPIRICAL FLOOD FORMULA	135
APPENDIX II WATER REQUIREMENTS IN FIELDS FOR RICE	161
APPENDIX III ANALYSIS AND EVALUATION HYDROMETEOROLOGICAL DATA	189
LIST OF IRRIGATION TERMS	213

IRRIGATION PLANNING STANDARDS

2013

OPENING.....	iii
FOREWORD.....	v
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW.....	x
LIST OF CONTENTS.....	xi
LIST OF TABLES.....	xviii
LIST OF FIGURES.....	xix
1. INTRODUCTION.....	1
1.1. General.....	1
1.2. Definition.....	1
1.3. Validity/Validity.....	1
1.4. Type of Main Building.....	2
1.4.1. Fixed Weirs.....	2
1.4.2. Vertical Moveable Weirs.....	3
1.4.3. Rubber Weirs.....	4
1.4.4. Bottom-Filter Weirs.....	4
1.4.5. Pump.....	5
1.4.6. Free Intake.....	5
1.4.7. Sawtooth Weirs.....	6
Main Building Parts.....	6
1.5.1. Weir Building.....	8
1.5.2. Intake.....	9
1.5.3. Rinsing.....	9
1.5.4. Mud Bag.....	13
1.5.5. River Strengthening Structures.....	13
1.5.6. Auxiliary Building.....	13
2. DATA.....	15
2.1. Introduction.....	15
2.2. Multisector Water Demand Data.....	16
2.3. Topographic data.....	17
2.4. Hydrological data.....	18
2.4.1. Flood discharge.....	18
2.4.2. Reliable low discharge.....	19
2.4.3. Water balance.....	20
2.5. Morphological Data.....	20
2.5.1. Morphology.....	20
2.5.2. River Geometric.....	21
2.6. Technical Geological Data.....	21
4.7.1. Geology.....	21
2.5.2. Soil Mechanics Data.....	22
3. WEIR BUILDINGS.....	23
3.1. General.....	23
3.2. Requirement for Determining Weir Location.....	23
3.2.1. Riverbed slope and base material.....	31
3.2.2. River Morphology.....	35

IRRIGATION PLANNING STANDARDS PLANNING CRITERIA PART MAIN BUILDINGS (HEAD WORKS) KP-2

3.3.	Water surface.....	37
3.4.	Topography.....	38
3.5.	Engineering Geological Conditions.....	38
3.6.	Implementation method.....	39
3.7.	Accessibility and Service Level.....	40
3.8.	Building Type.....	40
	3.8.1 General.....	40
	3.8.2 Water level control Structures.....	42
	3.8.3 Free waterfront buildings.....	44
4.	HYDRAULIC PLANNING.....	47
4.1.	General.....	47
4.2.	Spillway Weir.....	47
	4.2.1 Weir width.....	47
	4.2.2 Mercur planning.....	50
	4.2.3 Sawtooth spillway.....	60
	4.2.4 Layout and shape of sawtooth.....	61
	4.2.5 Base of the Weir.....	63
	4.2.6 Energy Dissipation.....	64
	4.2.7 Water Diving Pool.....	66
	4.2.8 Sink Type Energy Dissipation.....	71
	4.2.9 Vlugter Pool.....	75
	4.2.10 Energy Dissipation Modification.....	76
4.3.	Free Weir.....	85
	4.3.1 Water Level Settings.....	85
	4.3.2 Layout.....	86
	4.3.3 Gates.....	87
	4.3.4 Auxiliary Building of Free Dam.....	89
4.4.	Rubber Weir.....	90
	4.4.1 Width of Weir.....	90
	4.4.2 Mercur Plan (Rubber Tube).....	91
	4.4.3 Detention.....	93
	4.4.4 Reservoirs and discharge.....	94
	4.4.5 Energy Dissipation.....	94
	4.4.6 Floor Length Downstream of the Weir.....	94
4.5.	Pump.....	96
	4.5.1 Layout.....	96
	4.5.2 Pump Auxiliary Building.....	96
	4.5.3 Pump Energy.....	97
4.6.	Lower Filter Weir.....	101
	4.6.1 Layouts.....	101
	4.6.2 Lower Filter Weir Auxiliary Building.....	105
4.7.	Free Intake.....	106
5.	INTAKE AND RINSING (DRAINAGE) BUILDINGS.....	109
5.1.	Layout.....	109
5.2.	Intake Building.....	109
5.3.	Rinsing.....	113
5.4.	Bottom rinse.....	116
5.5.	Gates.....	120
	5.5.1 General.....	120
	5.5.2 Collection gate.....	122

5.5.3	Rinse gate.....	124
6.	BUILDING PLANNING.....	127
6.1.	General.....	127
6.2.	Use of special materials.....	127
	6.2.1. Surface protection.....	127
	6.2.2. Bare masonry protection.....	128
	6.2.3. Filter.....	129
	6.2.4. Gabions.....	131
6.3.	Foundation Materials.....	132
6.4.	Stability Analysis.....	134
	6.4.1. Forces type on buildings.....	134
	6.4.2. Water pressure.....	134
	6.4.3. Mud pressure.....	139
	6.4.4. Earthquake force.....	139
	6.4.5. Building Weight.....	140
	6.4.6. Foundation reaction.....	140
	6.4.7. Rubber Weir Stability Analysis.....	142
6.5.	Stability Needs.....	143
	6.5.1 Slip resistance.....	143
	6.5.2 Bolster.....	145
	6.5.3 Stability against underground erosion (piping).....	146
	6.5.4 Rubber pump of Weir body Force Plan.....	149
6.6.	Building Details.....	152
	6.6.1 Retaining walls.....	152
	6.6.2 Protection against Underground Erosion.....	155
	6.6.3 Energy Dissipation.....	158
7.	MUD BAG PLANNING.....	159
7.1.	Introduction.....	159
7.2.	Sediment.....	159
7.3.	Boundary conditions.....	160
	7.3.1. Intake Building.....	160
	7.3.2. Channel network.....	161
	7.3.3. Topography.....	162
7.4.	Mud Bag Dimensions.....	162
	7.4.1. Mud bag length and width.....	163
	7.4.2. Storage volume.....	165
7.5.	Cleaning.....	168
	7.5.1. Hydraulic cleaning.....	168
	7.5.2. Manual/mechanical cleaning.....	171
7.6.	Checking the Functioning of Mud Bags.....	172
	7.6.1. Deposition efficiency.....	172
	7.6.2. Rinsing efficiency.....	175
7.7.	Sludge Bag Layout, Flushing and Collection in Primary Channels.....	175
	7.7.1. Layout.....	175
	7.7.2. Rinsing.....	177
	7.7.3. Primary channel retrieval.....	179
	7.7.4. Flushing Channel.....	180
7.8.	Building Planning.....	180

IRRIGATION PLANNING STANDARDS

8. ARRANGEMENT OF THE RIVER AND AUXILIARY BUILDINGS	181
8.1. Protection Against Scour	181
8.1.1. River bed protection	181
8.1.2. River embankment protection	182
8.2. Embankment.....	186
8.2.1. Length and elevation.....	186
8.2.2. Axis direction	187
8.2.3. High Security	187
8.2.4. Cross section	187
8.2.5. Waster	188
8.3. River cut	189
9. INVESTIGATION OF HYDRAULIC MODELS.....	193
9.1. General	193
9.2. Model investigation for the Diversions Building	194
9.2.1. Location and layout	194
9.2.2. River regulation work.....	195
9.2.3. Spillway bending lighthouse shape	196
9.2.4. Door bending motion and threshold bending.....	197
9.2.5. Stilling pool.....	198
9.2.6. Exploitation of motion weir doors.....	199
9.2.7. Picking and rinsing.....	199
9.2.8. Directional channels and mud pockets.....	199
9.3. Criteria for Research with Models	200
10. INVESTIGATION OF HYDRAULIC MODELS.....	203
10.1. General	203
10.2. Implementation on the River.....	203
10.3. Implementation in a dry place	205
BIBLIOGRAPHY	207
ATTACHMENTS.....	209

IRRIGATION PLANNING STANDARDS PLANNING CRITERIA PART 3 CHANNEL KP-3

LIST OF CONTENTS

OPENING	iii	4. MASONRY CHANNEL	45
FOREWORD	v	4.1. Uses of Masonry Channels	45
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW	ix	4.2. Types of masonry	47
LIST OF CONTENTS	xi	4.2.1 Hard surface Lining	48
LIST OF TABLES	xv	4.2.2 Soil	49
LIST OF FIGURES	xvii	4.2.3 Lining Ferrocement	49
1. INTRODUCTION	1	4.3. Hydraulic planning	53
1.1. General	1	4.3.1 Maximum speed	53
2. IRRIGATION PLANNING DATA	3	4.3.2 Roughness coefficient	54
2.1. Topographic Data	3	4.3.3 Subcritical Flow Plan	55
2.2. Plan capacity	5	4.3.4 Channel curvature	56
2.2.1 Plan data	5	4.3.5 Freeboard height	56
2.2.2 Water requirements in rice fields	6		
2.2.3 Efficiency	7		
2.2.4 Technical rotation (group system)	10		
2.3. Geotechnical Data	11		
2.4. Sediment Data	12		
3. GROUND CHANNEL WITHOUT PAIR	15	5. TUNNEL AND CLOSED CANALS	57
3.1. Stable Channel Planning	15	5.1. Usage	57
3.1.1 Irrigation Flow Without Sediment in Soil Channels	16	5.1.1 Topography	57
3.1.2 Sedimented Irrigation Water in Installed Channels	17	5.1.2 Geology	57
3.1.3 Sedimented Irrigation Flow in Soil Channels	17	5.1.3 Excavation depth	58
3.2. Hydraulic Formulas and Criteria	17	5.1.4 Ground Water Conditions	58
3.2.1 Flow Formula	17	5.2. Forms and Hydraulic Criteria	58
3.2.2 Strickler roughness coefficient	18	5.2.1 Tunnels	58
3.2.3 Sedimentation	20	5.2.1.1 Flow Conditions	58
3.2.4 Erosion	21	5.2.1.2 Cross-Section Shape	59
Channel Cross Section	26	5.2.1.3 Minimum Size	61
3.3.1 Geometry	26	5.2.1.4 Arch	61
3.3.2 Channel Slope	26	5.2.1.5 Tunnel Buffers and Masonry	61
3.3.3 Channel curvature	27	5.2.1.6 Transition	64
3.3.4 Freeboard height	28	5.2.1.7 Minimum Cover	65
3.3.5 Width of embankment	29	5.2.2 Closed Channels	65
3.3.6 Land Acquisition Limits	31	5.2.2.1 Flow Conditions	66
3.3.7 Irrigation Channel Plan	34	5.2.2.2 Cross-Section Shape	66
3.3.7.1 General description	34	5.2.2.3 Arch	67
3.3.7.2 Procedures and Basis Calculation	35	5.2.2.4 Minimum Size	67
3.3.7.3 Carrying Channel Dimensions	35	5.3. Hydraulic Planning	67
3.3.7.4 Advantages and Weaknesses of Carrying (Irrigation) Channels	37	5.3.1 Flow Formula	67
3.4. Longitudinal Section	37	5.3.2 Roughness coefficient and maximum speed	67
3.4.1 Required water level	37	5.3.3 Hydraulic slope	68
3.4.2 Longitudinal Slope	40	5.3.4 Freeboard Height	68
3.4.2.1 Minimum slope	40	5.3.5 Cross-Section Planning	69
3.4.2.2 Maksimum Slope	41	5.3.6 Total High Loss Energy	69
3.4.2.3 Slope Channel Plan	41	5.3.7 High Loss Energy at Closed Channel Elbows and Bends	70
Cross-section of Land Channels Lining	43		
3.5. Cross-section of Land Channels Lining	43	6. DISCHARGE CHANNEL PLANNING	73
		6.1. Topographic Data	73
		6.2. Plan Debit	74
		6.2.1. Waste system	74
		6.2.2. The Rice plant wasters need	75
		6.2.3. The non-rice field wasters need	80
		6.2.4. Wasters Discharge	82
		6.3. Soil Mechanics Data	85

IRRIGATION PLANNING STANDARDS

7. DISCHARGE CHANNEL PLAN.....	87
7.1. Stable Discharge Channel Planning.....	87
7.2. Hydraulic Formulas and Criteria.....	88
7.2.1. Flow Formula.....	88
7.2.2. Stokler hardness coefficient.....	88
7.2.3. Maximum permitted speed.....	89
7.2.4. Water level height.....	91
7.3. Discharge Channel Cross Section.....	94
7.3.1. Geometry.....	94
7.3.2. The drainpipe slope.....	95
7.3.3. Curved drainpipe.....	95
7.3.4. Free guard Height.....	96
8. CARRYING CHANNEL PLANNING.....	99
8.1. General Description.....	99
8.2. Procedures and Basis for Calculation.....	100
8.2.1. Rational Method.....	100
8.2.2. Rain Duration and Rain Frequency Method.....	102
8.2.3. Complex Hydrograph Method.....	104
8.3. Procedures and Basis for Calculations.....	106
8.3.1. Irrigation Channel Capacity Standards.....	106
8.3.2. Irrigation Channel Characteristics.....	106
8.3.3. Advantages and disadvantages of Irrigation channels.....	106
BIBLIOGRAPHY.....	107
ATTACHMENTS.....	109

IRRIGATION PLANNING STANDARDS PLANNING CRITERIA PART BUILDING KP-4

LIST OF CONTENTS

OPENING	iii
FOREWORD	v
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW	ix
LIST OF CONTENTS	xi
LIST OF TABLES	xv
LIST OF FIGURES	xvii
1. INTRODUCTION	1
1.1. Scope	1
2. DISCHARGE MEASURING BUILDING.....	3
2.1. General	3
2.2. Board Crested Weir.....	4
2.2.1 Type	6
2.2.2 Hydraulic Planning.....	8
2.2.3 Flat bottom Flume	10
2.2.4 Modular Limits	10
2.2.5 Amount of debit	12
2.2.6 Staff Gauges	12
2.2.7 Debit Table	13
2.2.8 Characteristics of Board Crested Weir Instruments	14
2.2.9 Advantages of Board Crested Weir Instruments	15
2.2.10 Weaknesses of Board Crested Weir Instruments	15
2.2.11 Use of Board Crested Weir Instruments	15
2.3. Orifice Constand Head	16
2.3.1 Orifice Constand Head Instrument.....	16
2.3.2 Hydraulic Planning.....	16
2.3.3 Capacity and Characteristics	17
2.3.4 Hydraulics Calculations	18
2.3.5 Dimensions.....	18
Throated Flume	18
2.4.1 Throated Flume Measuring Instrument.....	18
2.4.1.1. Hydraulics Plan.....	20
2.4.1.2. Modular Limits	23
2.4.1.3. Advantages of the Throated Flume Measuring Instrument	24
2.4.1.4. Disadvantages of the Throated Flume Measuring Instrument.....	24
2.4.1.5. Limit Use of the Throated Flume Measuring Instrument.....	25
2.4.2 Cut-throated Flume measuring instrument.....	25
2.4.2.1. Determination of Discharge under Free Flow conditions.....	27
2.4.2.2. Installation of Cut-throated flume to obtain Free Flow conditions.....	28
2.5. Ronijn measuring Instrument.....	32
2.5.1. Types of Ronijn measuring instruments	32
2.5.2. Hydraulic Planning.....	34
2.5.3. Standard dimensions and discharge tables	36
2.5.4. Staff Gauges	37
2.5.5. Characteristics of the Ronijn Measuring Instrument.....	38
2.5.6. Advantages of the Ronijn Measuring Instrument	38
2.5.7. Disadvantages of the Ronijn Measuring Instrument.....	38
2.5.8. Use of the Ronijn Measuring Instrument.....	39
2.6. Crump-de Gruyter.....	39
2.6.1. Hydraulic Planning.....	40
2.6.2. Characteristics of the Crump-de Gruyter Measuring Instrument.....	42
2.6.3. Advantages of the Crump-de Gruyter Measuring Instrument.....	43
2.6.4. Disadvantages of the Crump-de Gruyter Measuring Instrument.....	43
2.6.5. Use of the Crump-de Gruyter Measuring Instrument.....	43
Neyrpic Module	43
2.7.1. General.....	43
2.7.2. Advantages of the Neyrpic Module	45
2.7.3. Disadvantages of the Neyrpic Module.....	45
Simple tapping pipe	46
2.8.1. Hydraulics Planning.....	46
2.8.1.1. Submerged.....	46
2.8.1.2. Free fall.....	48
2.8.2. Use of Simple Tapping Pipe.....	49
3. WATER LEVEL REGULATING BUILDINGS.....	51
3.1. General	51
3.2. Scotch Beam Door.....	51
3.2.1 Hydraulic Planning.....	52
3.2.2 The advantages of scotch beam doors.....	54
3.2.2 The Disadvantages of Scotch Beam Doors	54
Sliding door	54
3.3.1 Hydraulic Planning.....	54
3.3.2 Advantages of the Bottom Flush Door.....	55
3.3.3 Weaknesses.....	56
Radial doors	56
3.4.1 Advantages of Radial Doors.....	56
3.4.2 Disadvantages of Radial Doors	56
Fixed Mercu.....	57
3.5.1 Hydraulic Planning.....	57
3.5.2 The advantages of permanent Mercu.....	58
3.5.3 Weaknesses of fixed Mercu	59
U type Mercu.....	59
3.6.1 General.....	59
3.6.2 Structure Plan	60
3.6.3 Hydraulic Analysis	61
3.6.4 Considerations and Requirements	63
Trapezoidal control gap.....	65
3.7.1 Hydraulic Planning.....	67
3.7.2 Advantages of trapezoidal control Gap	68
3.7.3 Weaknesses of trapezoidal control Gaps.....	68
Use of Water Level Control Buildings.....	69
4. PLANNING FOR DIVISION AND TAPING	71
4.1. Diversions Building	71
4.2. Regulating Building	71
4.3. Tapping Building	77
4.3.1 Secondary tapping Building.....	77
4.3.2 Tertiary Tapping Building.....	78
4.3.3 Diversion Building and Tap Combination of Proportional System	79
4.3.4. Layout of Diversions and Tapping Buildings	80

6. STILLING BASIN.....	149
6.1. General.....	149
6.2. Diving pool.....	150
6.2.1. Graphical Hydraulic Calculations.....	150
6.2.2. Hydraulic Calculations.....	151
6.2.2.1. Basic Values of Hydraulic Jumps.....	152
6.3. The stilling pool for the Froude number is between 2.5 and 4.5.....	153
6.4. Stilling pool for Froude number >4.5.....	155
6.5. Vlugter Pool.....	156
6.6. Energy Dissipation Modification.....	157
6.7. Bare masonry protection.....	167
6.7.1. Retaining walls.....	168
7. PROTECTED BUILDINGS.....	171
7.1. General.....	171
7.2. Spillway.....	172
7.2.1. Spillway Channel Length Planning.....	174
7.2.2. Number method.....	176
7.2.3. Notes.....	177
7.2.4. Graphic Method.....	178
7.3. Spillway Siphon.....	180
7.3.1. Determination of dimensions.....	181
7.3.2. Cavitation.....	183
7.3.3. Types of Spillway siphons.....	186
7.4. Automatic Spillway Gate.....	189
7.5. Drain Building.....	191
7.5.1. Description.....	191
7.5.2. Drain door planning.....	191
7.6. Cross Thrower Building.....	192
7.6.1. General.....	192
7.6.2. Siphon.....	192
7.6.3. Water Tunnel.....	193
7.6.4. Overchute.....	193
7.6.5. Disposal groove.....	195
7.7. Sediment Excluder.....	198
7.7.1. General.....	199
7.7.2. Use of Sediment Excluder.....	202
7.7.3. Determining Building Location.....	202
7.7.4. Factors that influence the determination of the location of Sediment Excluder.....	203
7.7.5. Vortex Tubes.....	205
7.7.6. Tunnel Sediment Excluder.....	208
8. ROADS AND BRIDGES.....	213
8.1. General.....	213
8.2. Inspection Road.....	213
8.2.1. Classification.....	214
8.2.2. Cross section.....	215
8.2.3. Trace.....	215
8.2.4. Implementation.....	217
8.2.5. Drainage.....	221
8.3. Bridge.....	223
8.3.1. Type.....	223

5. CARRIER BUILDING.....	83
5.1. Introduction.....	83
5.2. Subcritical Group.....	83
5.2.1. Hydraulic Planning.....	83
5.2.2. Loss due to friction.....	84
5.2.3. Energy loss in transition.....	85
5.2.4. High Losses in Standard Elbows and Bends of Transition Channel.....	89
5.3. Channel Transition Standard.....	91
5.4. Water tunnel.....	92
5.4.1. General.....	92
5.4.2. Flow speed.....	95
5.4.3. Standard sizes.....	95
5.4.4. Minimum cover.....	98
5.4.5. Rectangular culvert.....	98
5.4.6. High energy losses for full-flow culverts.....	99
5.4.7. Standards for Size and Reinforcement of Rectangular Culverts.....	100
5.4.7.1. Loading Analysis.....	100
5.4.7.2. Parameter Design.....	100
5.4.7.3. Reinforcement.....	101
5.4.7.4. Implementation Basics.....	102
5.5. Siphon.....	105
5.5.1. General.....	105
5.5.2. Flow velocity.....	106
5.5.3. Seal the pipe inlet.....	106
5.5.4. High loss of energy.....	106
5.5.5. Filter grille.....	108
5.5.6. Overflow.....	109
5.5.7. Siphon Bridge.....	109
5.6. Gutters and Flumes.....	110
5.6.1. Gutters.....	110
5.6.1.1. Cross section.....	110
5.6.1.2. Slope and speed.....	110
5.6.1.3. Transition.....	111
5.6.1.4. Free guard Height.....	113
5.6.1.5. Material.....	113
5.6.1.6. Size Standard and Gutters Reinforcement.....	114
5.6.2. Elevated Flume Building.....	123
5.6.2.1. Determination of Dimensions.....	124
5.6.2.2. List of Elevated Flume Dimensions.....	128
5.7. Plunge Buildings.....	133
5.7.1. General.....	133
5.7.2. Controller Section.....	133
5.7.2.1. Hydraulic Measurements (figure 5-24).....	135
5.7.3. Vertical Plunge Buildings.....	137
5.7.4. Tilted Plunge Buildings.....	139
5.8. Tilted Gutters.....	141
5.8.1. Transition.....	141
5.8.2. Carrier Buildings.....	143
5.8.3. Unsteady flow.....	145

8.3.2. Liberation	223
8.3.3. Superstructure	223
8.3.4. Foundations and Piles	224
8.3.5. Open space	226
9. AUXILIARY BUILDINGS	299
9.1. Embankment	299
9.1.1. Utility	299
9.1.2. Material	299
9.1.3. Discharge Plan	230
9.1.4. Trace	230
9.1.5. Freeboard Height	230
9.1.6. Top width	231
9.1.7. Slope tilt	231
9.1.8. Embankment stability	232
9.1.9. Disposal	234
9.1.10. Protection	235
9.2. Exploitation Facilities	235
9.2.1. Communication	235
9.2.2. Offices and staff housing	237
9.2.3. Farmers Hall	238
9.2.4. Hectometer benchmark	238
9.2.5. Boundary Marks	239
9.2.6. Signage (Name Plate)	240
9.2.7. Pasten board (Operation Board)	241
9.2.8. Peischaal	241
9.2.9. Gates	242
9.2.10. AWLR (Automatic Water Level Recorder)	243
9.3. Other Buildings	244
9.3.1. Safety Equipment	244
9.3.2. Washing place	245
9.3.3. Livestock Bathing Pool	245
9.4. Seepage Prevention	246
9.4.1. General	246
9.4.2. Barrier wall	246
9.4.3. Edge Cover	247
9.4.4. Filter	248
9.4.5. Drain hole	249
9.4.6. Disposal groove	250
BIBLIOGRAPHY	251
ATTACHMENTS	255

IRRIGATION PLANNING STANDARDS

IRRIGATION PLANNING STANDARDS PLANNING CRITERIA PART TERTIARY LAYOUT KP-5

2013

LIST OF CONTENTS

OPENING	iii
FOREWORD	v
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW	ix
LIST OF CONTENTS	xi
LIST OF TABLES	xv
LIST OF FIGURES	xvii
1. INTRODUCTION	1
1.1. Background	1
1.2. Objective	2
1.3. Scope of These Planning Criteria	2
1.4. Applicability and Limitations	3
1.5. Terminology and Nomenclature (Nomenclature)	4
1.5.1. Terminology	4
1.5.2. Nomenclature System	5
2. PROBLEM APPROACH	9
2.1. Introduction	9
2.2. Planning Activities and Procedures	11
2.2.1. Preparation	11
2.2.2. Data collection and investigation	12
2.2.3. Preliminary Layout	13
2.2.4. Preliminary layout check	14
2.2.5. Detailed measurements	15
2.2.6. Detailed planning	15
2.2.7. Implementation	16
2.3. Links to Main Network Development Stages	16
2.4. Special considerations	17
2.4.1. Attitudes Towards Tertiary Plot Development	17
2.4.2. Approach in the inventory stage	18
2.4.3. Approach in the planning stage	19
3. BASIC DATA	21
3.1. Introduction	21
3.2. Topographic Mapping	21
3.3. Pictures of existing Network Planning and Post-Implementation	22
3.4. Inundation and drought that occur regularly	23
3.5. Distribution of water in tertiary plots	23
4. TERTIARY PLOT LAYOUT	25
4.1. Introduction	25
4.2. Ideal Tertiary Plot	26
4.3. Size and Shape of Tertiary and Quaternary Plots	29
4.4. Plot Boundaries	31
4.5. Areas that are not irrigated Identification	32
4.6. Channel Trace	33
4.6.1. Irrigation Channels	33
4.6.2. Excluder Channels	34
Road Network Layout	35
4.7. Layout in various types of terrain	36
4.8. Layout on steep terrain	37
4.8.1. Layout on steep terrain	37
4.8.2. The layout on the terrain is quite steep	41
4.8.3. Layout on bumpy terrain	42
4.8.4. Layout on flat terrain	44
Fish pond	26
4.9. Completed checking and settlement	50
4.10. Completed preliminary layout	50
4.10.1. Field check	50
4.10.2. Field check	50
4.10.3. Final Layout	51
5. CHANNEL PLANNING	53
5.1. Introduction	53
5.2. Irrigation Channels	54
5.2.1. Irrigation water requirements	54
5.2.2. Plan capacity	55
5.2.3. Design water level elevation	56
5.2.4. Channel characteristics	59
5.2.5. Quaternary irrigation/waste channels	62
5.3. Excluder Channel	63
5.3.1. Excluder modulus	65
5.3.2. Plan debit	66
5.3.3. Excess irrigation water	67
6. DIVERSION BOXES	75
6.1. General	75
6.2. Flexibility	76
6.3. Threshold	78
6.4. Door	85
7. PLANNING OF COMPLETE BUILDINGS	89
7.1. Introduction	89
7.2. Water Tunnel	89
7.3. Plunge Building	91
7.4. Gutter	95
7.5. Siphon	95
7.6. Masonry	97
7.7. Tilt Cutter	102
7.8. Road	106
7.8.1. Inspection Road	106
7.8.2. Farmers Road	106
7.8.3. Bridges	107
7.9. Final Building	109
8. ARRANGEMENT OF FINAL PLAN	111
8.1. Picture	111
8.2. Explanatory Note	114
8.3. E&P Manual	114
BIBLIOGRAPHY	116
ATTACHMENTS	118

LIST OF CONTENTS

OPENING.....	iii
FOREWORD.....	v
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW.....	ix
LIST OF CONTENTS.....	xi
LIST OF TABLES.....	xv
LIST OF FIGURES.....	xvii
1. INTRODUCTION.....	1
1.1. Scope.....	1
2. DATA.....	3
2.1. Material Requirements.....	3
2.2. Properties of Building Materials.....	3
2.2.1. Volume Weight.....	4
2.3. Soil.....	4
2.3.1. Soil classification system according to the Unified Soil Classification System.....	4
2.3.2. Slope Stability.....	11
2.3.3. Bearing capacity of subsoil for foundations.....	16
2.3.4. Subgrade subsidence.....	22
2.3.5. Soft ground improvement.....	23
2.3.5.1. Problem.....	23
2.3.5.2. Properties and characteristics of soft soil.....	24
2.3.5.3. Overview of Foundation Engineering.....	28
2.3.5.4. Soft Soil Repair Techniques.....	31
3. STRESS PLAN.....	37
3.1. Load.....	37
3.1.1. Dead load.....	37
3.1.2. Live load.....	37
3.1.2.1. Vehicle load.....	37
3.1.2.2. Man/animal burden.....	43
3.2. Earth pressure and mud pressure.....	43
3.2.1. Earth pressure.....	43
3.2.2. Mud pressure.....	46
3.3. Water pressure.....	47
3.3.1. Hydrostatic pressure.....	47
3.3.2. Hydrodynamic pressure.....	48
3.3.3. Seepage.....	49
3.3.4. Safety Factors for Seepage Downstream of the Back Floor of the Weir.....	67
3.4. Loads due to earthquakes.....	68
3.5. Loading combination.....	72
3.6. Permissible stress and safety factor.....	72
3.6.1. Permissible voltage.....	72
3.6.2. Safety factor.....	73
3.7. Earth Pressure Due to Earthquake.....	74
3.7.1. Normative reference.....	74
3.7.2. Earth Pressure Due to Earthquake.....	74
4. HYDRAULIC PLANNING.....	77

**IRRIGATION PLANNING STANDARDS
PLANNING CRITERIA PART BUILDING
PARAMETERS KP-6**

4.1. General.....	77
4.2. Rock.....	77
4.3. Mortel.....	78
5. CONCRETE.....	81
5.1. Problem.....	81
5.2. Classification.....	82
5.3. Reinforcement.....	84
5.4. Reinforced Concrete Limit Strength Analysis.....	86
5.4.1. Notation.....	86
5.4.1.1. Flexural Strength of Single Reinforced Square Beam.....	86
5.4.1.2. Limitations on Tensile Reinforcement.....	88
5.4.1.3. Double Reinforced Square Beam.....	91
5.4.2. Flexible plate analysis.....	95
5.4.2.1. Flexing One Way.....	95
5.5. Cross-section of T-Beams and Doubly Reinforced Beams.....	98
5.5.1. Problem.....	98
5.5.2. Flexible T Beam Analysis.....	100
5.5.2.1. Calculated As pure T Beam.....	101
5.5.3. Calculated as a square T-Beam If $N_f < N_b$	102
5.5.4. Limitations on T-Beam Tensile Reinforcement.....	103
6. POLE FOUNDATION.....	105
6.1. Problem.....	105
6.2. Requirements.....	106
6.2.1. Geotechnical Conditions.....	106
6.2.2. Supporting Data.....	106
6.2.3. Pole Durability Requirements.....	108
6.3. Provisions.....	108
6.3.1. Axial Bearing Capacity of Vertical Poles.....	108
6.3.1.1. General requirements.....	108
6.3.1.2. Utilimit Axial Carrying Capacity Formula.....	111
6.3.1.3. Reduction of Axial Bearing Capacity.....	116
6.3.1.4. Axial Bearing Capacity of Inclined Piles.....	117
6.3.1.5. Axial Bearing Capacity of Pile Group.....	117
6.3.2. Lateral Resistance.....	118
6.3.2.1. General requirements.....	118
6.3.2.2. Calculating the Utilimit Lateral Resistance of a Single Pole Empirically.....	118
6.3.2.3. Calculating Utilimit Lateral Resistance of Pile Groups.....	119
6.3.2.4. Calculating Utilimit Lateral Resistance Broms Method.....	120
6.3.3. Subsidence of Pile Foundations.....	134
6.3.3.1. Provision.....	134
6.3.3.2. Calculation of Single Pile Drop.....	134
6.3.4. Lateral Deformation.....	142
6.3.4.1. Lateral Deformation of a Single Pile.....	142
6.3.4.2. Lateral Deformation of Pile Groups.....	143
6.3.5. Pole Bending Strength.....	143
6.3.5.1. General requirements.....	143
6.3.5.2. Bending Strength Calculations.....	143
6.3.6. Utilimit and Service styles.....	144
6.3.6.1. Utilimit and Service styles.....	144
6.3.6.2. Lateral Force and Bending Moment.....	144
6.3.7. Foundation Beam Planning.....	145
6.3.7.1. Foundation Beam Structure.....	145
6.3.7.2. Foundation Beam Structure Above Pile Head.....	145
6.3.7.3. Connection Structure Above the Pole Head.....	145
6.3.8. Pole Structure Planning.....	148
6.3.8.1. General requirements.....	148
6.3.8.2. Lateral Force Due to Sidfill Soil (oprit) in Soft Soil.....	149
6.3.9. Pile Foundation Analysis.....	150
6.3.9.1. Linear Analysis.....	150
6.3.9.2. Non-Linear Analysis.....	150
6.3.9.3. Computer Analysis.....	151
6.3.10. Pole End and Head Structure.....	151

**BIBLIOGRAPHY
ATTACHMENTS**

4.1. General.....	77
4.2. Rock.....	77
4.3. Mortel.....	78
5. CONCRETE.....	81
5.1. Problem.....	81
5.2. Classification.....	82
5.3. Reinforcement.....	84
5.4. Reinforced Concrete Limit Strength Analysis.....	86
5.4.1. Notation.....	86
5.4.1.1. Flexural Strength of Single Reinforced Square Beam.....	86
5.4.1.2. Limitations on Tensile Reinforcement.....	88
5.4.1.3. Double Reinforced Square Beam.....	91
5.4.2. Flexible plate analysis.....	95
5.4.2.1. Flexing One Way.....	95
5.5. Cross-section of T-Beams and Doubly Reinforced Beams.....	98
5.5.1. Problem.....	98
5.5.2. Flexible T Beam Analysis.....	100
5.5.2.1. Calculated As pure T Beam.....	101
5.5.3. Calculated as a square T-Beam If $N_f < N_b$	102
5.5.4. Limitations on T-Beam Tensile Reinforcement.....	103
6. POLE FOUNDATION.....	105
6.1. Problem.....	105
6.2. Requirements.....	106
6.2.1. Geotechnical Conditions.....	106
6.2.2. Supporting Data.....	106
6.2.3. Pole Durability Requirements.....	108
6.3. Provisions.....	108
6.3.1. Axial Bearing Capacity of Vertical Poles.....	108
6.3.1.1. General requirements.....	108
6.3.1.2. Utilimit Axial Carrying Capacity Formula.....	111
6.3.1.3. Reduction of Axial Bearing Capacity.....	116
6.3.1.4. Axial Bearing Capacity of Inclined Piles.....	117
6.3.1.5. Axial Bearing Capacity of Pile Group.....	117
6.3.2. Lateral Resistance.....	118
6.3.2.1. General requirements.....	118
6.3.2.2. Calculating the Utilimit Lateral Resistance of a Single Pole Empirically.....	118
6.3.2.3. Calculating Utilimit Lateral Resistance of Pile Groups.....	119
6.3.2.4. Calculating Utilimit Lateral Resistance Broms Method.....	120
6.3.3. Subsidence of Pile Foundations.....	134
6.3.3.1. Provision.....	134
6.3.3.2. Calculation of Single Pile Drop.....	134
6.3.4. Lateral Deformation.....	142
6.3.4.1. Lateral Deformation of a Single Pile.....	142
6.3.4.2. Lateral Deformation of Pile Groups.....	143
6.3.5. Pole Bending Strength.....	143
6.3.5.1. General requirements.....	143
6.3.5.2. Bending Strength Calculations.....	143
6.3.6. Utilimit and Service styles.....	144
6.3.6.1. Utilimit and Service styles.....	144

LIST OF CONTENTS

OPENING.....iii
FOREWORD.....v
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW.....k
LIST OF CONTENTS.....xi
LIST OF TABLES.....xv
LIST OF FIGURES.....xvii
1. INTRODUCTION.....1
2. IMAGE PAPER SIZE.....5
3. TITLE BLOCK.....7
4. IMAGE NUMBERING.....9
5. IMAGE REDUCTION.....13
6. IMAGE DIRECTIONS.....15
7. SCALE, LINE THICKNESS, HEIGHT OF LETTERS AND NUMBERS.....17
8. SIZES AND INDICATIONS.....21
9. SYMBOLS, SHARE, AND ABBREVIATIONS.....25
10. DRAWINGS FOR CANALS, WATER AND DIMCHES.....29
11. MAP COLOR SYSTEM.....39
12. IMAGE FOLDING.....41
13. DRAWING USING A COMPUTER.....43
14. PRINTING IMAGES.....45

IRRIGATION PLANNING STANDARDS

**IRRIGATION PLANNING STANDARDS
PLANNING CRITERIA PART DEPICTION
STANDARDS KP-7**

LIST OF CONTENTS

OPENING.....iii

FOREWORD.....v

TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW.....ix

LIST OF CONTENTS.....xi

LIST OF TABLES.....xv

LIST OF FIGURES.....xvii

1. PLANNING.....1

1.1. Background.....1

1.2. Review of the old Door Plan.....2

1.3. Selection of Doors for Standardization.....4

1.4. Standardization Goals.....5

1.5. General Planning Considerations.....6

1.6. Special Planning Considerations.....8

1.6.1. Tertiary and Quaternary Box Doors.....8

1.6.2. Sliding doors for channels and culverts Span up to 1.20 m.....11

1.6.3. Romijn Door.....12

1.6.4. Sliding Door for Channels, Span 1.20 m to 2.50 m.....13

1.6.5. Water Level Control Doors in Buildings.....14

1.6.6. *Crump-de-Gruyter* door.....19

1.6.7. Radial Door.....19

1.6.8. Balanced Valve Door.....22

1.6.9. Automatic Elevation Adjusting Door with Counterweight.....24

1.6.10. Wooden sliding door.....29

1.7. Use of Electric Motors to Drive Lifting Equipment.....30

1.8. Specifications and Plan Drawings.....31

1.9. Specification.....31

1.10. Plan Drawing.....32

2. INSTALLATION, OPERATION AND MAINTENANCE.....33

2.1. Door Installation.....33

2.1.1. General.....33

2.1.2. Radial Door Installation.....34

2.2. Delivery Phase Trial.....37

2.3. Discharge Measurement.....39

2.4. Guide to Door Inspection and Maintenance.....39

2.4.1. Inspection.....39

2.5. Old Door Repair.....40

2.6. Application for Supply and Storage of Spare Parts.....40

ATTACHMENTS 1.....43

ATTACHMENTS 2.....45

**SECTION PLANNING CRITERIA IRRIGATION
CONTROL GATES STANDARDS: PLANNING,
INSTALLATION, OPERATION AND MAINTENANCE
KP-08**

LIST OF CONTENTS

OPENING	iii
FOREWORD	v
TEAM FORMULATING IRRIGATION PLANNING CRITERIA REVIEW	k
LIST OF CONTENTS	xi
LIST OF TABLES	xv
LIST OF FIGURES	xvii
1. GENERAL	1
1.1. Specification Scope	1
1.2. Limitation	1
1.3. Working Stress and Planning	2
1.4. Standardization and Maintenance	2
1.5. Unit of measure	3
1.6. Nameplate	3
1.7. Alterations and Equipment	3
1.8. Directors' approval	3
1.9. Picture	4
1.10. Drawing Approval Procedures	4
1.11. Advance Shipping for Armatures	5
1.12. Job Standards and Skills	5
1.13. Material Cutting	12
1.14. Cold Dipping and Tempering	12
1.15. Welding Work	12
1.16. Welder Qualifications	13
1.17. Welding Rod	13
1.18. Bolt and Rivet Connections	14
1.19. Field Assembly	14
1.20. Bearing	14
1.21. Design Voltage	15
2. PROTECTION AGAINST CORROSION AND TRANSPORTATION	19
2.1. Protection, Cleaning and Painting	19
2.1.1. General	19
2.1.2. Surface Preparation	20
2.1.3. Implementation of Procedures	21
2.1.4. Unpainted Surface	21
2.1.5. Painting Settings	22
2.2. Door Protection Against Corrosion in Coastal Areas	22
2.3. Galvanized	23
2.4. Inspection Conditions	23
2.5. Assembly and Inspection Procedures	24
2.6. Preparation and Storage of Bolts	25
2.7. Packing and Marking	26
2.8. Installation, Operation and Maintenance Instructions	26
2.9. Spare Parts, Special Tools and others	27
3. INSTALLATION AND MAINTENANCE	29
3.1. Installation	29
3.2. Phase Test Completed	30
3.3. Maintenance period	30

IRRIGATION PLANNING STANDARDS

IRRIGATION WATER CONTROL GATE STANDARDS:
TECHNICAL SPECIFICATIONS KP-09

4.8.4. Door Frame	80
4.8.5. Leaf doors.....	81
4.8.6. Door Drive Gear Unit.....	83
Single Drive Wooden Sliding Door - Handlebar Type	84
4.9.1. General.....	84
4.9.2. Door Size.....	84
4.9.3. Handlebar Support Pad	84
4.9.4. Leaf doors.....	85
4.9.5. Door Drive Gear Unit.....	85
5. WATER LEVEL ADJUSTING DOOR	87
5.1. General.....	87
5.2. Types of Water Level Control Doors.....	87
5.2.1. Stoplog Type Elevation Control Door	87
5.2.2. Double Sliding Door.....	88
5.2.3. Sliding Door Combined with Fixed Threshold.....	91
5.3. Door Frame	92
5.4. Leafdoors.....	93
5.5. Door Drive Gear.....	94
ATTACHMENTS.....	95

4. DISCHARGE CONTROL DOOR.....	31
4.1. Tertiary and Quaternary Box Doors.....	31
4.1.1. Steel Door Leaf Type	31
4.1.2. Glass Fiber Reinforcement Plastic Door Leaf Type	32
Sliding Doors for Channels and Culverts Spanning Up to 1.20 m	35
4.2.1. General.....	35
4.2.2. Door and Drive Gear Size	37
4.2.3. Center bearing and handlebar support.....	38
4.2.4. Door Frame	38
4.2.5. Leaf doors.....	40
4.2.6. Door Drive Gear	40
Channel Sorong Door, Span up to 2.50 m	41
4.3.1. General.....	41
4.3.2. Door and Drive Gear Size	42
4.3.3. Door Frame	43
4.3.4. Leaf doors.....	44
4.3.5. Door Drive Gear.....	44
Romijn Door	45
4.4.1. General.....	45
4.4.2. Door Frame	46
4.4.3. Bottom Door	47
4.4.4. Upper Door.....	48
4.4.5. Drive Gear	49
4.4.6. Measuring instrument.....	50
Crump de Gruyter door	50
4.5.1. General.....	50
4.5.2. Door Frame	51
4.5.3. Leaf doors.....	52
4.5.4. Drive Gear	53
4.5.5. Measuring Instruments and Discharge Plates	53
4.5.6. Type A Drive Gear Unit.....	54
4.5.7. Type B, C and D Door Drive Gear Units	56
Radial Door	60
4.6.1. General	60
4.6.2. Door and Drive Gear Size	61
4.6.3. Embedded Parts.....	62
4.6.4. Door Construction, Door Arms and Swivel Supports.....	63
4.6.5. Work Platform.....	65
4.6.6. Type I and II Drive Gear Units	65
Automatic doors.....	69
4.7.1. General.....	69
4.7.2. Door Size.....	74
4.7.3. Door Frame	75
4.7.4. Turnstiles and Pens.....	75
4.7.5. Counter-Weight	77
4.7.6. Channel Base Elevation	78
Double Drive Handlebar Type Wooden Sliding Door.....	78
4.8.1. General.....	78
4.8.2. Door Size.....	79
4.8.3. Handlebar Support Pad	80

LIST OF CONTENTS

Foreword	i
List of contents	ii
CHAPTER I GENERAL	
1.1. Intent of the Guide.....	1
1.2. Scope of Guidance	1
1.3. Definition, Understanding and Limitations.....	1
1.4. Type of Embankment Dam	1
1.5. Construction Design and Implementation.....	5
1.5.1. Basic Considerations in Design Making	5
1.5.2. Basic Considerations in Construction Implementation	6
CHAPTER II INTRODUCTION	
2.1. Survey and Investigation Plan.....	8
2.1.1. General	8
2.1.2. Survey and investigation stages	8
2.1.3. Survey and Investigation Guidelines	10
2.1.4. Scope of Surveys and Investigations for General Planning (Planning).....	10
2.1.5. Scope of Survey and Investigation for Design	10
2.1.6. Scope of Survey and Investigation for Construction Implementation.....	11
2.1.7. Scope of Investigation for Operations and Maintenance.....	11
2.1.8. Scope of Survey for Compensation.....	11
2.1.9. Scope of Investigation for the Environment.....	12
2.2. Types of Surveys and Investigations	13
2.2.1. Meteorological and Hydrological Surveys.....	13
2.2.1.1. Meteorological and Hydrological Data Collection.....	13
2.2.1.2. Meteorological and Hydrological Observations	15
2.2.1.3. Data Collection and Storage	18
2.2.2. River Condition Investigation	19
2.2.2.1. Scope and Benefits of River State Investigation	20
2.2.2.2. Water Quality Research.....	21
2.2.2.3. Investigation of the state of the river bed	21
2.2.3. Topographic Survey and Investigation.....	21
2.2.3.1. Scope and Plan of Topographic Survey and Investigation	21
2.2.3.2. Topographic Survey	25
2.2.3.3. Investigation of landform classification	32
2.2.4. Geological Investigations	37
2.2.4.1. Scope and Procedures of Geological Investigation	37
2.2.4.2. Geological Investigation and Geotechnical Test Procedures.....	49
2.2.4.3. Laboratory Test.....	78
2.2.4.4. Processing Investigation Results	83
2.2.5. Building Materials Investigation	95
2.2.5.1. Types of Work and Investigation Plans.....	95
2.2.5.2. Investigation of Embankment Type Dam Materials.....	102
2.2.5.3. Material Test.....	110

**EMBANKMENT DAM PLANNING GUIDE. VOLUME I
SURVEY AND INVESTIGATION**

JULY 1999



DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER

LIST OF CONTENTS

Foreword	i
List of contents	ii
I. INTRODUCTION	
1.1. General	1
1.2. Purpose and Objectives	1
1.3. Scope of Guidance	1
1.4. Things that need to be considered	2
1.5. Validity and limitations	2
2. DATA PROCESSING	
2.1. General	3
2.2. Data Processing Activities	5
2.2.1. Manual checking of rain data	5
2.2.2. Statistical examination	6
a. Homogeneity Check with Multiple Mass Curves	6
b. Outlier Check	7
2.2.3. Filling in missing rain data	9
3. Design Flood	
3.1. General	10
3.2. Calculation of design floods from rainfall data	13
3.2.1. Approach Method	13
3.2.2. Rainfall design	16
a. Frequency analysis	16
b. Maximum possible rainfall (PMP)	28
3.2.3. Design flood hydrograph	34
a. DPS rainfall (Basin rainfall)	34
b. Storm rain distribution pattern	36
c. Effective/net rain	39
d. Unit Hydrograph	41
e. Testing the results of Flood discharge calculations	49
f. Flood Hydrograph	49
3.2.4. Searching for Floods Through Reservoirs	53
4. WATER AVAILABILITY	69
4.1. Necessary data	59
4.2. Mathematical Model of Rain and Runoff Relationship (NRECA)	60
a. Model Structure	60
b. DPS Characteristic Parameters	61
c. Parameter calibration	63
d. Calculation steps	64
5. RESERVOIR CAPACITIES	69
5.1. Reservoir reliability	69
5.2. Determination of reservoir capacity	69
5.3. Reservoir water balance simulation	70
6. RESERVOIR SEDIMENTATION	72
6.1. Small DPS Sediment Rate Estimates based on empirical equations	72
6.2. Floating Sediment Load Measurement	79
6.3. Baseline Sediment Load Estimates	83

**EMBANKMENT DAM PLANNING GUIDE VOLUME II
HYDROLOGICAL ANALYSIS**

JULY 1999



DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER

6.4.	Estimated Total Sediment Load	86
6.5.	Trap Reservoir Efficiency	88
6.6.	Sediment Specific Gravity	89
6.7.	Reservoir Age.....	91
	6.7.1. Sediment distribution in the reservoir	93
	APPENDIX A1: 24-hour BMB isohit map (PMP) for West Java	95
	APPENDIX A2: 24-hour BMB isohit map (PMP) for Central Java.....	96
	APPENDIX A3: 24-hour BMB isohit map (PMP) for East Java	97
	APPENDIX B: List of Names and Institutions	98
	APPENDIX C: Glossary of Terms.....	99
	BIBLIOGRAPHY	101

EMBANKMENT DAM PLANNING GUIDE, VOLUME III FOUNDATION AND DAM BODY DESIGN

JULY 1999



DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER

LIST OF CONTENTS

Foreword	i
List of contents	ii
I. Introduction	1
1.1. General	1
1.2. Purpose and Objectives	1
1.3. Scope of Guidance	2
1.4. Things that need to be considered	2
1.5. Validity and limitations	3
CHAPTER I General	4
CHAPTER II Sorting Dam Locations and Dam Types	5
2.1. Dam Location	5
2.2. Dam Type	7
CHAPTER III Selection of Backfill Dam Type	10
3.1. Homogeneous Dam	11
3.2. Zonal Dam	14
CHAPTER IV Foundation of the Urugan Dam	22
4.1. Rock Foundation	22
4.2. Sand and gravel foundation	23
4.3. Soil foundation	23
CHAPTER V Causes of Embankment Dam Failure	26
5.1. Hydraulic failure	26
5.2. Failure due to seepage (Seepage failure)	26
5.2.1. Water-pass foundation	27
5.2.2. Leaks through embankments	27
5.2.3. Seepage in discharge pipe	27
5.2.4. Landslide on the dam body	28
5.2.5. Structural failure	28
5.2.6. Collapse due to foundation	29
5.2.7. Landslide on the dam body	29
CHAPTER VI Basic Criteria for Dam Design	31
6.1. Safe and stable against hydraulic failure	31
6.2. Safe and stable against seepage or filtration flow	31
6.3. Safe and stable against structural failure	32
CHAPTER VII Main Criteria for Dam Design	33
7.1. Spillway building capacity	33
7.2. Guard height (freeboard)	33
7.3. Allowable decline	37
7.4. Upstream slope protection	37
7.4.1. Average diameter and weight of rip-rap rocks by hand	39
7.4.2. Filter technical specifications	40
7.5. Downstream slope protection	43
7.6. Width of dam crest	43
CHAPTER VIII Dam Stability Against Seepage	44
8.1. Seepage line pattern	44
8.2. Creation of a flow trajectory network (seepage flownet)	48
8.3. Filtration flow capacity	53
8.4. Symptoms of sufficiency (piping) and popping (boiling)	56
CHAPTER IX Handling seepage through foundations	58
9.1. Grouting and grouting of curtains	58
9.2. Barrier ditch	59
9.3. Partial barrier ditch	61
9.4. Block fence	62
9.5. Barrier ditch with cement reinforcement	62
9.6. Local cast concrete diaphragm	62
9.7. Upstream blanket layer	62
9.8. Drainage wells (pressure relief wells)	65
CHAPTER X Drainage in Embankment Dam	68
10.1. Horizontal drainage blanket	68
10.2. Chimney drainage	69
10.3. Rock heels (rock toe)	70
10.4. Heel drainage (Toe drainage) and drainage ditch	71
CHAPTER XI Embankment Materials	72
11.1. Waterproof zone material	72
11.2. Materials for filters and transition zones	76
11.3. Stone material	80
11.4. Other Ingredients	83
CHAPTER XII Slope Stability	85
12.1 Slope Stability Assessment	85

LIST OF CONTENTS

Foreword	i
List of contents	ii
I. Introduction	
1.1. General	1
1.2. Purpose and Objectives	1
1.3. Scope of Guidance	1
1.4. Things that need to be considered	1
1.5. Validity and limitations	1
2. Complementary buildings	3
1) Spillway Building (Spillway)	3
2) Outlet Building	3
3) Emergency spillway building	3
3. Spillway Building	4
1) General	4
2) Spillway building type	5
3) Location and characteristics of spillway buildings	5
4) The gate to the Mercur of the spillway building	7
5) Emergency spillway building	8
3.1. Spillway building hydraulics	11
3.2. Spillway with type "Morning Glory"	23
3.3. The spillway is in the form of an "orifice"	34
3.4. Conductor portion (guide portion)	38
3.5. Energy dissipation	44
1) General explanation	44
2) Stilling basin type energy dissipation	48
(1) Flat stilling pool type	48
a. The final threshold for energy dissipation buildings	48
b. USBR type I flat exercise pool	49
c. USBR type II flat stilling pool	50
d. USBR type III flat stilling pool	51
e. USBR type IV flat stilling pool	51
(2) Hydraulic jump depth	54
(3) Determination of the longitudinal size of flat stilling basin	57
(4) Flow transmitter gears (clute blocks)	58
(5) Clashing gears	59
(6) Threshold at the downstream end of the stilling basin	59
(7) Freeboard height for stilling basin	60
(8) Basin type with sloping floor (Sloping apron type)	60
(9) The slope type rises downstream (Moerted sloping type)	61
3) Vortex basin or vortex pool type energy dissipation	62
4) Jump-type energy dissipation or ski jump dissipator	66
Hydraulic test model	69
3.6.1. Implementation of testing	69
3.6.2. Data required for model testing	71
3.6.3. Evaluation of test results	72
Spillway building construction design	72
3.7.1. General	72

**EMBANKMENT DAM PLANNING GUIDE VOLUME IV
AUXILIARY BUILDING DESIGN**

JULY 1999



**DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER**

3.7.2. Inlet channel	74
3.7.3. Chute type	78
3.7.4. Energy dissipation	78
4. Intake Building Construction	79
4.1. Intake building for flood controls	79
4.2. The layout of the mouth (inlet) for the outlet building	79
4.3. Intake type	79
4.4. Inclined conduits	83
4.5. Intake Meru (spillway)	83
4.6. Building facility components for Intake	83
4.7. Gates valve	85
4.8. Selection of location and building type for intake	87
4.9. Characteristics of each type of intake building	85
4.10. Diversion channel	88
4.11. Hydraulic design of intake buildings	88
4.12. Driving canals	90
4.13. Type of outlet building (outlet work)	92
4.14. Selection of outlet building type	94
4.15. Pressurized conduit	95
4.16. Unstressed conduits	95
4.17. Capacity and air holes	96
4.18. Energy dissipation	96
4.19. Hydrodynamic pressure	97
4.20. Protection against erosion and scouring	98
4.21. Outlet building facilities	99
BIBLIOGRAPHY	102
APPENDIX A: List of Names and Institutions	103
APPENDIX B: Glossary of Terms/Definitions	104

EMBANKMENT DAM PLANNING GUIDE VOLUME V HYDROMECHANICAL WORK, INSTRUMENTATION AND AUX BUILDING

JULY 1999



DEPARTMENT OF PUBLIC WORKS DIRECTORATE
GENERAL OF WATER DAM SECURITY CENTER

LIST OF CONTENTS

Foreword	i
List of contents	ii
1. Introduction	1
1.1. General	1
1.2. Purpose and Objectives	1
1.3. Scope of Guidance	2
1.4. Things that need to be considered	2
1.5. Validity and limitations	3
2. Gates and Valves	4
2.1. General	4
2.2. Gate and valve type	5
2.2.1. Gate type and name	5
2.2.2. Valve type	6
2.3. Type of gates and valves on dam	7
2.3.1. Image of gate and valve types	11
2.3.2. Valves	17
2.3.3. Design criteria	23
2.3.3.1. Design load	23
2.3.3.2. Material stress	33
2.3.3.3. Size allowance for corrosion	38
2.3.3.4. Material for gates	39
2.3.3.5. Painting	40
3. DAM INSTRUMENTS	45
3.1. Meaning	45
3.2. Minimal instrument requirements	45
3.3. Instrumentation for embankment dams	46
3.3.1. Piezometers and observation wells	46
3.3.2. Seepage measuring instrument	57
3.3.3. Internal movement measuring instrument	60
3.3.4. Surface motion measuring instrument	71
REFERENCE LIST	77