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# BASIS OF ESTIMATES

National Currency Printing and Secure Banknote Production Facility Project  
(NCPBF)

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**Project Title:**

National Currency Printing and Secure Banknote Production Facility Project  
(NCPBF)

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**Project Sponsor:**

Central Bank

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*Prepared by: PMIC of Lazuli Pamir Consulting – for learning purpose only*

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## **Basis of Estimates (BOE)**

**Project:** National Currency Printing and Secure Banknote Production Facility (NCPBF)

**Prepared By:** PMIC – Project Management Initiatives Center

**Document Type:** Project Cost Management Supporting Document

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### **1. Purpose:**

The Basis of Estimates document provides detailed explanatory information supporting the development of project cost estimates for the National Currency Printing and Secure Banknote Production Facility Project (NCPBF). This document serves as a formal reference describing how the project’s cost estimates were derived and the analytical processes used to determine the overall project budget.

The purpose of this document is to clearly describe the estimation assumptions, estimation methodologies, cost data sources, calculation approaches, and confidence levels used in preparing the project’s cost estimates. By documenting these elements, the Basis of Estimates ensures transparency, traceability, and methodological consistency in the estimation process. This documentation also allows stakeholders and project governance bodies to understand the rationale behind the financial projections associated with the project.

In addition, the Basis of Estimates provides the analytical foundation used for the development of the project cost baseline. It supports effective cost management by enabling project managers, financial analysts, and governance authorities to validate the accuracy of cost estimates, monitor cost performance, and evaluate the financial impact of project changes throughout the project lifecycle.

The document also facilitates alignment between the Work Breakdown Structure (WBS), cost estimates, and resource requirements by demonstrating how individual work packages contribute to the total project cost. This alignment ensures that each project component has a clearly defined financial basis and supports accurate cost aggregation at the control account and project levels.

Furthermore, the Basis of Estimates serves as a reference document for future cost reviews, estimate updates, risk assessments, and change management decisions. If modifications to project scope, schedule, procurement strategies, or technical requirements occur, the documented estimation assumptions and calculation methods allow the project team to reassess cost implications in a structured and consistent manner.

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By providing a comprehensive explanation of how project costs were developed, this document enhances financial accountability, supports governance oversight, and strengthens the credibility of the project's financial planning framework. It also contributes to improved cost forecasting and financial decision-making throughout the implementation of the NCPBF project.

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## **2. Estimation Approach:**

Cost estimates for the National Currency Printing and Secure Banknote Production Facility Project (NCPBF) were developed using a combination of recognized project estimation techniques to ensure accuracy, reliability, and alignment with industry standards for large-scale infrastructure and high-security facility projects. Multiple estimation methods were applied in a complementary manner to balance strategic-level estimates with detailed technical cost calculations. This integrated estimation approach helps improve the confidence level of the project cost estimates and supports effective financial planning and governance oversight.

The estimation process considered the complexity of the project, the specialized nature of currency printing technology, the strict security requirements associated with banknote production facilities, and the long implementation timeline of the project. The following estimation techniques were applied during the development of the project cost estimates.

### **Analogous Estimating**

Analogous estimating was used during the early estimation stages to develop preliminary cost projections based on historical data from similar projects. Reference data from comparable high-security industrial facilities, currency printing plants, and secure government infrastructure projects were analyzed to identify cost benchmarks and cost distribution patterns.

This method provided an initial understanding of the expected cost range for major project components such as facility construction, specialized machinery procurement, security infrastructure deployment, and operational technology systems. Analogous estimating allowed the project team to establish a realistic initial budget framework before detailed engineering design and procurement specifications were finalized.

### **Parametric Estimating**

Parametric estimating techniques were applied to calculate construction and infrastructure costs using quantitative relationships between project parameters and historical cost data. Parametric models were developed based on cost-per-unit

measurements such as cost per square meter of high-security industrial construction, cost per security-controlled access point, and cost per production line capacity.

Engineering design parameters, facility size, production capacity requirements, and infrastructure complexity were used as input variables for parametric cost calculations. This approach helped improve estimation consistency and enabled the project team to scale cost estimates based on facility size, production capacity, and system complexity.

### **Bottom-Up Estimating**

Bottom-up estimating was used to generate the most detailed and accurate cost estimates for the project. This method involved estimating the costs of individual work packages identified in the Work Breakdown Structure (WBS). Each work package was analyzed to determine the required resources, materials, equipment, labor, and services needed for successful completion.

Detailed cost estimates were prepared at the work package level and subsequently aggregated at the control account level and project level to determine the total estimated project cost. This approach ensured that cost estimates reflect the detailed scope of work and resource requirements for each project component.

### **Vendor Quotations**

Budgetary quotations and preliminary proposals from qualified international vendors were used to estimate costs associated with specialized banknote printing equipment, inspection systems, finishing machines, and high-security production technology. Vendor input also supported cost estimation for IT infrastructure, cybersecurity systems, and surveillance platforms.

These vendor quotations provided realistic pricing information for equipment procurement, installation services, system integration, technical support, training programs, and warranty coverage. Vendor-based estimates were particularly important for specialized technologies where historical cost data may be limited.

### **Expert Judgment**

Expert judgment played a critical role in validating and refining the project cost estimates. Subject matter experts with experience in secure facility construction, banknote printing technology, cybersecurity infrastructure, and industrial operations were consulted during the estimation process.

These experts provided professional insights on realistic cost assumptions, resource requirements, procurement risks, and potential technical challenges. Their expertise

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helped ensure that the cost estimates reflect industry best practices and that potential estimation uncertainties were properly considered.

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### **3. Estimation Assumptions:**

The following key assumptions were used during the estimation process:

1. Government funding will be released according to the approved project financing schedule.
  2. Construction costs will remain within expected market ranges during the project duration.
  3. International printing machinery vendors will provide equipment within estimated procurement costs.
  4. Skilled technical personnel will be available for facility construction, equipment installation, and operational training.
  5. Currency production technology will remain stable without major design changes during the project lifecycle.
  6. Logistics and import costs for specialized machinery will remain consistent with current international market rates.
  7. Security infrastructure requirements will remain aligned with national regulatory standards.
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### **4. Estimation Constraints:**

Several constraints were considered while preparing the cost estimates:

1. The project budget must remain within the approved funding ceiling.
2. Strict national security requirements limit vendor selection and procurement options.
3. The facility design must comply with security and operational regulations.
4. Procurement lead times for specialized machinery may impact final installation costs.

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5. The project must be completed within the planned project duration of sixty months.
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### **5. Cost Data Sources:**

The following sources were used to develop the cost estimates:

- Historical data from similar secure production facilities
  - Market price databases for construction materials
  - Vendor quotations for printing equipment
  - Industry benchmarks for cybersecurity and surveillance systems
  - Engineering design estimates
  - Construction industry cost indices
  - Government procurement price references
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### **6. Estimation Methodology by Cost Category:**

#### **6.1 Facility Construction**

Construction cost estimates were developed based on engineering design parameters, building size, structural complexity, and security infrastructure requirements. Cost models included labor, materials, construction equipment, safety systems, and contractor overhead.

#### **6.2 Printing Machinery and Equipment**

Equipment cost estimates were derived from vendor quotations for banknote printing presses, finishing equipment, inspection systems, and packaging machinery. Estimates include installation services, training, warranty, and spare parts packages.

#### **6.3 IT and Cybersecurity Systems**

IT infrastructure estimates include servers, network equipment, cybersecurity systems, production management software, and system integration services.

#### **6.4 Physical Security Systems**

Security system estimates include access control systems, biometric devices, CCTV surveillance systems, intrusion detection systems, and centralized monitoring platforms.

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## 6.5 Training and Capacity Building

Training costs include vendor-led training programs, operational training workshops, security training exercises, and technical certification programs.

## 6.6 Testing and Commissioning

Testing costs include factory acceptance testing, site acceptance testing, trial production runs, system integration testing, and operational readiness validation.

## 7. Cost Estimate Summary:

Cost Category	Estimated Cost (USD)
Facility Construction	120,000,000
Printing Machinery & Equipment	150,000,000
IT & Security Systems	40,000,000
Training & Capacity Building	15,000,000
Contingency Reserve	25,000,000
<b>Total Project Cost</b>	<b>350,000,000</b>

## 8. Contingency and Risk Allowances:

Contingency reserves have been included to address identified project risks. These reserves are calculated based on quantitative risk analysis and expected monetary value assessments for potential cost impacts associated with procurement delays, construction risks, technology integration challenges, and security compliance requirements.

Contingency reserves are managed by the Project Manager and may be used only when approved through established project governance procedures.

## 9. Accuracy Level:

The current project cost estimate represents a **Class II estimate** based on detailed design information and vendor quotations. The expected accuracy range for the estimate is approximately **±10 percent**.

This level of accuracy is considered appropriate for large infrastructure projects at the project planning stage.

### 10. Estimation Review and Validation:

The project cost estimates were reviewed and validated through the following processes:

- Technical review by engineering experts
- Financial review by project finance specialists
- Vendor quotation validation
- Independent cost benchmarking
- Steering Committee review

These validation processes ensure that the cost estimates are realistic and aligned with industry standards.

### 11. Approval:

Name	Role	Signature	Date
Project Manager	NCPBF Project Manager		
Finance Director	Central Bank		
Project Sponsor	Central Bank Governor		