YOOSHIN-VITTI J/V
27/A, SHANGSHAD AVENUE
(6th floor)
DHAKA-1215
TEL: + 880 2 8143471
CELL: + 88 01912888001
FAX: 880 2 8143470
E-mail: vittibd@gmail.com

Memo No. : Vitti/BLPA/2016/36

Date: 30th August, 2016

To
Project Director
Bangladesh Trade and Transport Studies RETF Project
Bangladesh Land Port Authority
TCB Bhaban, 5th Floor, Kawran Bazar,
Dhaka 1215.

Subject: Submission of **Final Feasibility Study (FS) Report, FS Environmental Impact Assessment (EIA), FS Social Impact Assessment (SIA), Detail Design: Environmental Impact Assessment (EIA) and Detail Design: Resettlement Action Plan (RAP) and Construction Documents for SHEOLA LAND PORT** under transport facilitation studies RETF project" (BLPA Component).

Dear Sir,

As per agreement we have completed all related works in accordance with the TOR for the Sheola Land Port. Previously on 17th August we submitted draft Feasibility Study (FS) Report, FS Environmental Impact Assessment (EIA), FS Social Impact Assessment (SIA), Detail Design: Environmental Impact Assessment (EIA) and Detail Design: Resettlement Action Plan (RAP) and Construction Documents for Sheola Land Port incorporating all comments. Now we are submitting after restructuring in the following manner.

1. Feasibility Study (FS) Report of Sheola Land port
2. FS of Environmental Impact Assessment (EIA) Report of Sheola Land port
3. FS of Social Impact Assessment (SIA) Report of Sheola land port
4. Detail Design : Environmental Impact Assessment (EIA) Report of Sheola Land port
5. Detail Design : Resettlement Action Plan (RAP) of Sheola land port
6. Construction documents :
    a. Tender documents :
        Volume -I : Bidding documents
        Volume – II : Bill of quantities (BOQ)
        Volume – III : Technical Specification
        Volume – IV : Drawings.
    b. Pre-qualification documents & Cost estimation.

For your kind approval.

Thanking You

_____
Md. Ishtiaque Zahir
Authorized Signatory
YOOSIN-VITTI-J/V

TABLE OF CONTENTS

TABLE OF CONTENTS i

LIST OF TABLES ..... **v**

LIST OF FIGURES ..... **vi**

LIST OF ABBREVIATIONS OF TECHNICAL SYMBOLS AND TERMS ..... **viii**

EXECUTIVE SUMMARY **0**

Chapter 1: Introduction **1**

1.1. Back ground of the Study / Project 1

1.2. The Project Area /Study Area 1

1.3. Project Objectives 1

1.4. Scope of Works 3

1.5. The StudyTeam 4

1.6. Study Period 5

1.7. Study Schedule 5

1.8. Reviewed Reports 6

Chapter 2: Addressing Growth Potential for Focal Areas **0**

2.1. Major Socio-economic Indicators of Bangladesh 1

2.1.1. Population 1

2.1.2. Number of Registered Vehicle 1

2.1.3. Economic Growth 2

2.2. Export and Import Trends in Bangladesh 3

2.2.1. Current Trade Status ofBangladesh and Forecast of Trade 3

2.2.2. Major import and Export Item in Bangladesh 4

2.2.3. Current State of Import and Export between Bangladesh-India 7

2.3. Current Situation of Land Ports in Bangladesh 8

2.4. New Strategies for Export-led Growth in the 7th Five Year Plan 10

2.5. Summary and Implications 11

Chapter 3: Current Situation **1**

3.1. Introduction 1

3.2. Historical Overview 2

3.3. Border Management and Trade Facilitation Issues 2

3.3.1. Border Management at Bangladesh Border Side 4

3.3.2. Border Management at Indian Border Side 4

3.4. Multi-modal Connectivity to Sheola Land Port 4

3.5. Regional Connectivity 8
3.5.1. Bangladesh 8
3.5.2. India 9
3.6. Existing Physical Conditions 11
3.6.1. Bangladesh Border side 11
3.6.2. Indian Border side 21
3.7. Existing Operational Conditions 21
3.7.1. Export-Import Procedure in Bangladesh Border Side 21
3.7.2. Export-Import Procedure in Indian Border Side 22
3.7.3. Organizations in Bangladesh Border Side 23
3.7.4. Organizations in Indian Border Side 24
3.8. Export and Import throughSheola Land Port 24
3.8.1. Export and Import Trends 24
3.8.2. Origin-Destination of Export-Import Commodities 26
3.9. Summary and Implications 28

Chapter 4: Traffic Impact Assessment 0
4.1. Introduction 1
4.2. Forecast for Export and Import Quantities 2
4.2.1. Assumptions for Export/Import Forecast 2
4.2.2. Forecast for Export/Import Quantities 2
4.3. Forecast for Numbers of Entry and Departure People 4
4.3.1. Assumptions for Entry/Departure People 4
4.3.2. Forecast for Numbers of Entry/Departure People 5
4.4. Forecast for Traffic Volumes on the Access road 5
4.4.1. Current Situation of the Access Road 5
4.4.2. Assumptions for Traffic Volume Forecast on the Access Road 6
4.4.3. Forecast Results for Traffic Volumes on the Access Road 7
4.5. Summary and Implications 8

Chapter 5: Preliminary Design 0
5.1. Introduction 1
5.2. Design Concept and Master Plan 1

5.2.1. Border Layout 1
5.3. Planning Concept 5
5.4. Master Plan 5
5.4.1. Phase Development 5
5.4.2. Space Requirement 5
5.4.3. Open Stack Yard 8
5.4.4. Space Program 9
5.4.5. Land Use Alternative 10
5.4.6. Operational Plan 13
5.4.7. Cargo Circulation/ Passenger Circulation 15
5.4.8. Material Schedule 17
5.4.9. Land Acquisition 18
5.5. Structural Design 18
5.5.1. Structural Design Criterions 19
5.6. Electrical Design 24
5.6.1. Major Equipment for Power Supply 24
5.6.2. Design Conditions & Parameters for Power Supply 25
5.6.3. Design & Construction Requirements 25
5.6.4. Earthing System 26
5.6.5. Generator 27
5.6.6. 11/0.415KV, 3-Phase, 50Hz, Substation 27
5.7. Implementation Schedule 27
5.8. Cost Estimation 29
5.8.1. Methodology of Estimation 29
5.8.2. Cost Summary 32

Chapter 6: Environmental Assessment 1
6.1. Executive Summery 1
A. Introduction 1
B. Policy, Legal Administrative and Regulatory Framework 1
C. Project Description 2
D. Initial Screening and Scoping of Environmental Impacts 3
E. Environmental Assessment 4
F. Alternative Analysis 4

G. Stakeholder and Public Consultation 5

H. Environmental Management and Monitoring Plan 6

I. Institutional Arrangements 7

Chapter 7: Social Impact Assessment 1

7.1. Executive Summery 1

Chapter 8: Economic and Financial Analysis 1

8.1. INTRODUCTION 1

8.2. COST ANALYSIS 2

8.3. ECONOMIC ANALYSIS 5

8.4. FINANCIAL ANALYSIS 8

8.5. RISK ANALYSIS 10

Annexure 01: Traffic Analysis Data NX-1

Annexure 02: Import Export & CIQ Procedure Data NX-5

Annexure 03: Population Data NX-49

Annexure 04: Cost Estimate NX-51

Annexure 05: Check list NX-74

Annexure 06: FGD meeting NX-74

Annexure 07: Free Prior Public Consultation NX-78

Annexure 08: National Consultation Workshop NX-93

Annexure 09: Analysis of Similar Case Studies NX-100

LIST OF TABLES

Table 1.1: Schedule of Feasibility Study for Sheola Area 5
Table 2.1: Population Trends of Bangladesh Unit: (1,000 people) 1
Table 2.2: Population by Region in Bangladesh 2011 1
Table 2.3: Registered Vehicle Trends in Bangladesh (unit: Thousand and %) 2
Table 2.4: Projected Economic Growth Rate of Bangladesh and Other Countries 2
Table 2.5: Export and Import of Bangladesh (million USD) 3
Table 2.6: Prospect of Export and Import in Bangladesh (million USD, %) 3
Table 2.7: Current Export Partners of Bangladesh (million USD, %) 3
Table 2.8: Current Import Partners of Bangladesh (million USD, %) 4
Table 2.9: Major Export Commodities of Bangladesh (million USD) 4
Table 2.10: Major import Commodities of Bangladesh (million USD) 7
Table 2.11: Current Status of Bilateral Trade (million USD) 8
Table 2.12: List of Land Ports in Bangladesh 8
Table 3.1: Allowable Carrying Capacity in different size 14
Table 3.2: Collected Water level and discharge data of Kushiyara River 16
Table 3.3: Probable Water levels of the Kushiyara River at Sheola Station for three distribution methods 19
Table 3.4: Chi square and K-S test results 19
Table 3.2: People using Immigration Office (Unit: persons/year) 24
Table 3.3: Working People (Staff) in SheolaLand Port (Unit: people) 24
Table 3.4: Major Import Items in Sheola Land Port (2014/15) 25
Table 3.5: Major Export Items in Sheola Land Port (2014/15) 25
Table 3.6: Trend of Export and Import in Sheola Land Port (unit: Tons, %) 26
Table 4.1: Target Years of Transport Demand Forecast 1
Table 4.2: Scenarios of Export/Import Growth (unit: %) 3
Table 4.3: Forecast Results of Export/Import Quantities (unit: ton) 3
Table 4.4: Forecast Results of Export/Import Quantities (unit: USD thousand) 3
Table 4.5: Scenarios of Entry/Departure Growth (unit: %) 5
Table 4.6: Forecast Results of Entry/Departure People (unit: persons) 5
Table 4.7: Survey Site of Traffic Volume 6
Table 4.8: Survey Result of Traffic Volume at Peak-Time by Car Type(unit: vehicle/hour) 6
Table 4.9: Forecast Results for Traffic Volumes on the Access Road(unit: vehicle/hour) 7
Table 4.10: ForecastResultsfor Traffic Volumes within Sheola Land Port 8
Table 5.1: Space Requirement for Sheola Land Port 9
Table 5.2: Material Schedule 17
Table 8.1: Improvement Costs for Sheola Land Port 4
Table 8.2: Operation and Maintenance Costs for Sheola Land Port 5
Table 8.3: Economic Benefits of Improving Sheola Land Port 6
Table 8.4: Cost-Benefit Analysis 7
Table 8.5: Revenue (income) Estimation for Sheola Land Port 8
Table 8.6: Cost-Revenue Analysis Table 9
Table 8.7: Risks and Mitigation Means 10

LIST OF FIGURES

Figure 1.1: Location of Sheola Land Port 2
Figure 2.1: Location Map of Inland Ports in Bangladesh 10
Figure 2.2: GDP Growth Targets in 7th Five Year Plan 11
Figure 3.1: The Project area at present 1
Figure 3.2: Location of Sheola in Satellite image 1
Figure 3.3: The routes (Water, Rail and Road)surrounding the Land Port Area 4
Figure 3.4: Map showing the Bordrline and Kushiyara River 5
Figure 3.5: Exising situation in and around the river 5
Figure 3.6: Map showing road network, customs and immegration facilities 6
Figure 3.7: Map showing the cross-border abandoned railway network 6
Figure 3.8: Existing situation of the Railway Track and Railway Station 7
Figure 3.9: Comparison of Activities in Single- and Multi-modal Options 8
Figure 3.10: Integrated Transportation Network 10
Figure 3.11: Location of Borehole for sub-soil investigation 13
Figure 3.12: Spot height of the site and alignment of canal (existing and proposed) 15
Figure 3.13: Cross Section of the canal 16
Figure 3.14: Location Map of Data Collection Point at Sheola on the Kushiyara River 16
Figure 3.15: Monsoon Season Water Level Hydrograph of Kushiyara at Sheola 17
Figure 3.16: Gumbel Distribution of Return Period
Figure 3.17: Return Period Calculation 18
Figure 3.18: Return Period Calculation 19
Figure 3.19: Cross-Section of the road in Bangladesh side (existing and proposed) 20
Figure 3.20: Procedure of Export from Bangladesh 22
Figure 3.21: Procedure of Import from India 23
Figure 3.22: Import through Sheola Land Port 27
Figure 3.23: Export through Sheola Land Port from passing vehicle O/D Survey 28
Figure 4.1: Work Flow for Traffic Demand Forecast 1
Figure 4.2: Work Flow for Traffic Demand Forecast 4
Figure 4.3: Traffic Volume Survey Points 6
Figure 5.1: Conceptual image of Juxtaposed Border Layout 1
Figure 5.2: Juxtraposed border of Germany and Poland (prior to Poland's accession to EU) 1
Figure 5.3: Conceptual image of Staggered Border Layout 2
Figure 5.4: Conceptual image of Traditional Border Layout 3
Figure 5.5: Traffic Demand Forecast for the Target Year 4
Figure 5.6: Future mode of Communication and goods transferring 5
Figure 5.7: Organization of Customs for Sheola Land Port 6
Figure 5.8: Organizationof Immigration for Sheola Land Port 6
Figure 5.9: Organization of BLPA for Sheola Land Port 7
Figure 5.10: Passenger Terminal 7
Figure 5.11: Calculation for Warehouse 8
Figure 5.12: Proposed volume for Warehouse 8
Figure 5.13: Calculation for Open Stack Yard 8
Figure 5.14: Proposed volume for open Stack Yard 8
Figure 5.15: Diagram Showing Alternative Plan-1 for Sheola Land Port 10
Figure 5.16: Diagram Showing Alternative Plan-2 for Sheola Land Port 11

Figure5.17: Diagram Showing Alternative Plan -3 for Sheola Land Port..... 12
Figure 5.18: Comparison of Alternative 1, 2 and 3..... 13
Figure 5.19: Operational Plan for the First Phase 14
Figure 5.20: Operational Plan for the Second Phase..... 15
Figure 5.21: Circulation Plan within the Site 16
Figure 5.22: Cargo Collection Pocess..... 16
Figure 5.23: Cargo Delivery Process..... 17
Figure 5.24: Land Acquisition Plan on RS Mauza Map..... 18
Figure 5.25: Implementation Schedule for Feasibility Study Report at Sheola..... 28
Figure 6.1: Focus Group Discussions at Sheola 8
Figure 6.2: Public Consultations at Sheola 8
Figure 6.3: National consultation meeting at Dhaka..... 9
Figure 8.1: Work Flows for Feasibility Studies..... 1
Figure 8.2: Work Flows for Economic and Financial Analysis..... 1

LIST OF ABBREVIATIONS OF TECHNICAL SYMBOLS AND TERMS

ARIPO	Acquisition and Requisition of Immovable Property Ordinance of 1982
BBS	Bangladesh Bureau of Statistics
BPLA	Bangladesh Land Port Authority
CCL	Cash Compensation under the Law
DC	Deputy Commissioner
DoE	Department of Environment
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMSF	Environmental and Social Management Framework
FGD	Focus Group Discussion
GED	General Economic Division
HH	Household
ICP	Integrated Check Point
IDA	International Development Association
IEE	Initial Environmental Evaluation
IGA	Income Generating Activities
IPDP	Indigenous People's Development Plan
LC	Land Customs
LP	Land Port
NGO	Non-Government Organization
OPs	Operational Policies
PAHs	Project Affected Households
PAPs	Project Affected Persons
PD	Project Director
PIU	Project Implementation Unit
PM	Project Manager
PRA	Participatory Rural Appraisal
PVAC	Property Valuation Advisory Committee
R&R	Resettlement & Rehabilitation
RAP	Resettlement Action Plan
RP	Resettlement Plan
RPF	Resettlement Policy Framework
RRA	Rapid Rural Appraisal
RU- BLPA	Resettlement Unit- Bangladesh Land Port Authority

SIA	Social Impact Assessment
SMF	Social Management Framework
SMP	Social Management Plan
SPS	Sanitary and Phytosanitary
STD	Sexually Transmitted Disease
TL	Team Leader
TOR	Terms of Reference
WB	World Bank

EXECUTIVE SUMMARY

1. Introduction

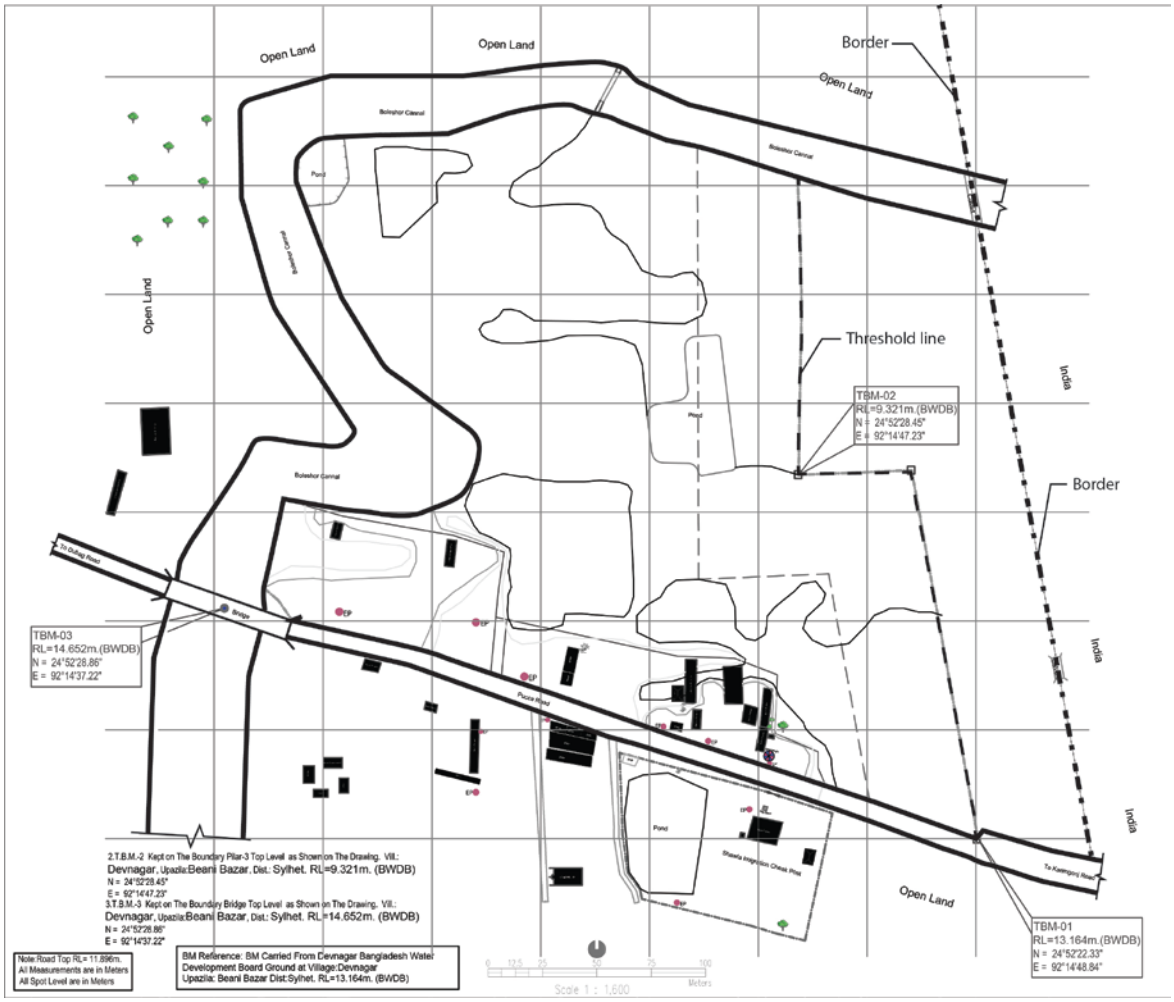
Sheola Land Customs (LC) Station started its function in 1948. It is situated in Borogram at Beanibazar of Shylet District. From the starting of the LC Station, export and import activities were conducted through the Kushiyara river route. In 1996, this LC station was transferred to the Borogram, 2km away from the previous place. Nevertheless, the name of this LC station remained the same.

The distance of Sheola Land Customs (LC) station from Beanibazar Upazila Parishad is 13km and 45km from Sylhet district Headquarter. The Indian part of it is called Sutarkandi, which is situated under Karimganj district of Assam State. A 16 km paved road exists from Sheola to Karimganj district. The distance from Sheola/Sutarkandi to Gouhati, capital of Assam is 264 km.

2. Current Situation

The topographic map collected from the office of the Surveyor General, GOB and Topographic survey that has been done shows that the area is a low lying one with few high lands. It has an area of about 10.83 acres of land. The project area lies at 24°52'22.33" (N) latitude and 92°14'48.84" (E) longitude.

Figure 1: Topography of Sheola Land Port



The most significant climatic character in this area is humid subtropical with a predominantly hot and humid summer and a relatively cool winter. The area is within the monsoon climatic zone, with annual average highest temperatures of 23 °C (August-October) and average lowest temperature of 7 °C (January). Nearly 80% of the annual average rainfall of 3,334 mm occurs between May and September.

Hydrological data station for Sheola is situated on Kushiyara River and very near to the project. As such, this station of BWDB represents the project. Both water level and as well as discharge data has been collected from BWDB. Analysis from the data shows a 100 years Return period for the flood level to be 14.884mPWD.

The trade in Sheola land port is 134,162 ton/year (12,809,753 USD/year) in 2014/15. The amount of import (99,325 ton) is much higher than that of export (34,837 ton) in their weights. However, the amount of export (11,155,225 USD) is much higher than that of import (1,654,528 USD) in their monetary values.

Table 1: Trade Volume in Sheola Land Port (2014/15)

Import			**Export**		
Item	Ton	USD	Item	Ton	USD
Coal	**96,458**	**1,251,332,**	Cement	**18,025**	**1,324,680**
Orange	1,164	328,533	Food	10,979	6,432,504
Ginger	1,165	57,262	Caustic soda	1,730	882,500
Apple	26	9,478	Liquid chlorine gas	1,654	409,003
Citrus	14	3,954	Plastic materials	638	691,789
Others	48	3,968	Others	1,862	1,144,749
Total	99,325	1,654,528	Total	34,837	11,155,225

Source: BLPA, 2016

Number of people coming in and going out from Bangladesh are 9,000~11,000 persons per year in 2014~2015.

3. Traffic Demand Forecast

Based on the economic growth scenario in the future, forecast results of export/import quantities are shown by scenario. Total trade amount in 2040 is expected to be in the range of 2.0 ~ 3.0 million tons a year.

In consideration of industrial development policies of the government of Bangladesh, the future trade volumes at Sheola land port are 1.1 million tons in 2030 and 2.4 million tons in 2040.

Table 2. Forecast Results of Export/Import Quantities (unit: ton)

Items	2016	2020	2025	2030	2035	2040
Import	131,060	228,191	445,625	789,250	1,221,419	1,724,668
Export	43,240	66,617	134,695	251,203	412,871	633,822
Total	174,301	294,808	580,320	1,040,454	1,634,290	2,358,490

Source: Calculated by the consultant

Based on the two growth scenario in the future, total number of people who come in and go out from Bangladesh will be 65,000~75,000 persons.

When a plan and a design of Sheola land port are established, the assumptions in the forecast process are considered and some planning principles can be set up as follows:

- acquire land necessary for its demand in long-term view;
- develop the land in phased manner with targeting the year 2030 & 2040, and;
- ensure flexibility with which changed shares of commodities and upgraded CIQ procedures can be deployed.

4. Design Concept and Master Plan

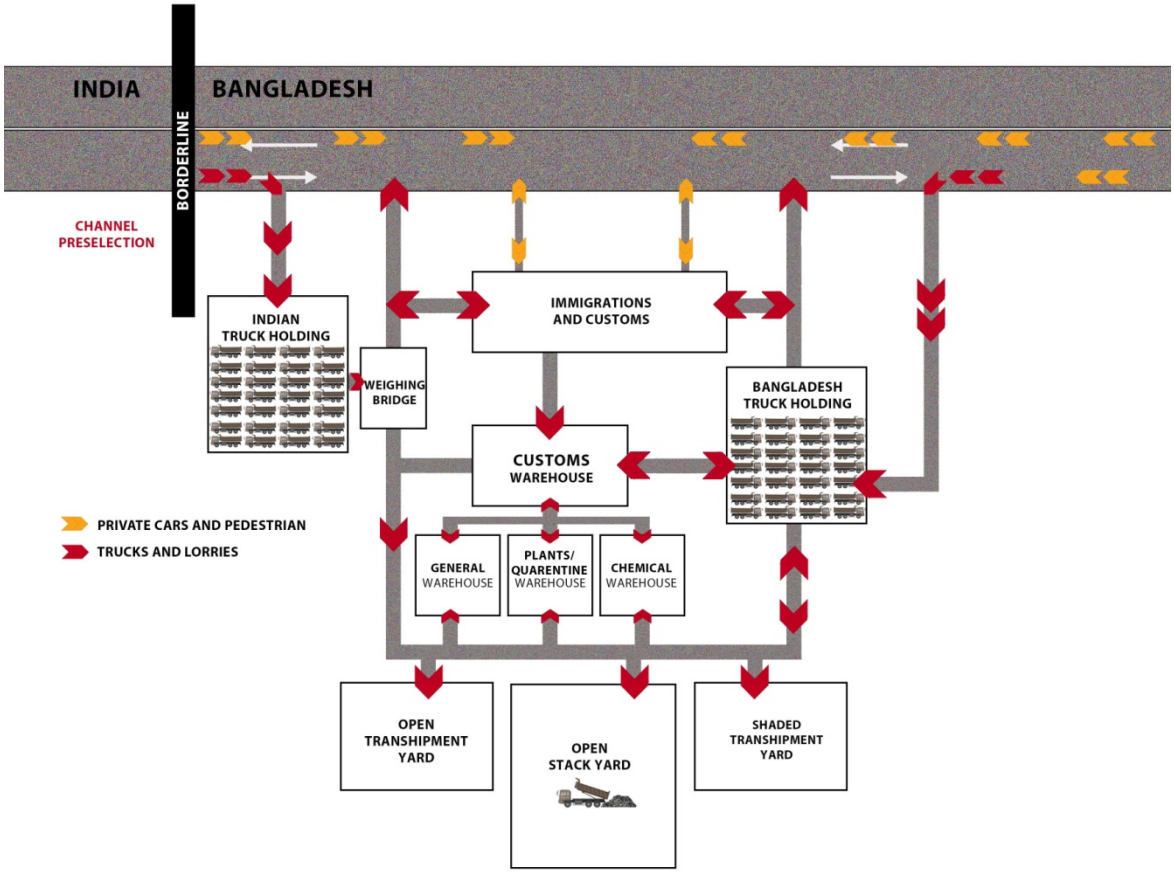
i. Design Concept:

Design concepts were established in consideration of:

- CIQ procedures for coming-in and going-out movements;
- land acquisition for expansion of the land port;
- functional efficiency within the land port.

Goods from India entering Bangladesh through the border are carried by Indian registered trebles. On entry through the border crossing, the custom Offices at the border truck entry point manually record the details of imported goods in a register and receive import documents. The documents are subsequently forwarded to the customs house for assessment of import duties. The trucklers then proceed to BLP for goods to loaded and stored in the warehouse and open yard. Delivery of goods form BLP is affected after customs clearance and duty on the imported goods is paid.

Figure 2: Design Concept



Source: Developed by the consultants

Most export goods are not subject to duty. Export documents are collected by the same customs cargo section at the border before the good vehicle cross into India. The Bangladesh exports are transferred directly on Indian trucks at the Indian land port. The empty Bangladesh trucks returns to Bangladesh upon completion of the transfer.

The expansion of the existing is made to the border direction even though there expects to have some difficulties to acquire the land space. The final design concept is selected as shown in Figure 2.

ii. Master Plan:

The master plan for Sheola land port development was established as shown in Figure 4 in consideration with trends of current trade (import & export) including commodity types with logistics patterns.

The Sheola Land Port will be developed into two phases: Phase 1 with a target year 2030 and phase 2 with a year 2040. Essential facilities that need to be operated for the land port in phase 1 are administration building, 1 warehouse, 2 transshipment yards, 2 truck terminals, and the rest of the facilities will be completed in phase 2.

According to industrial development in both countries (Bangladesh and India), commodity types and transport patterns will be dramatically changed for the long term. Logistics pattern will also be changed with containerization and integration with IT technologies.

Therefore, the land use within the land port should be planned with flexibility to adjust new circumstances. This will required improvement and widening of existing road and other infrastructure like electrical load capacity upto 3600 KVA.

Figure 3: Implementation Plan (Phase 1)

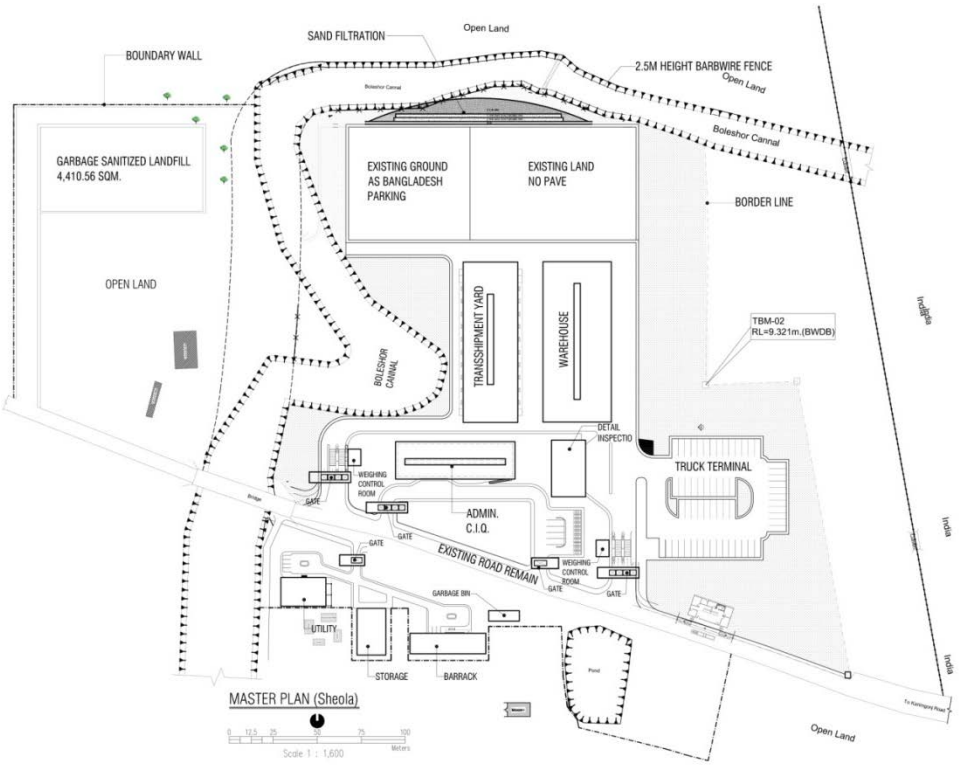
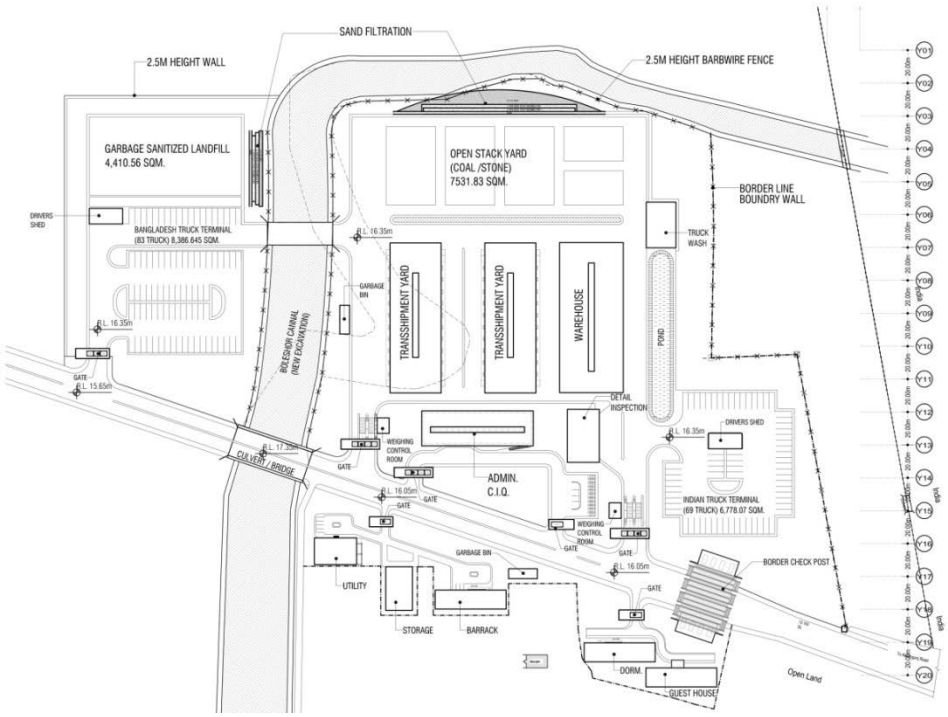


Figure 4: Implementation Plan (Phase 2)



5. Environmental & Social Impacts

i. Environmental Impacts:

An Environmental Assessment (EA) has been carried out for the proposed project according to the requirement of **World Bank Safeguard Policies OP 4.01**. An environmental screening was conducted for categorization of the project. An EA report has been prepared through identifying the potential impacts, alternate option study, assessing proposed project and link project, Trans boundary effect, cumulative Impact, and recommending possible mitigating and enhancing measure for negative and positive effects, respectively. An outline of EMP has been given in the present report to mitigate/enhance the impacts, which are expected to occur during construction and operation phase of the project.

22.1 acres of land has been selected for proposed Sheola Land Port most of the is low land. Total 48 affected person are identified as project affected person. 36 land owner as affected of which 24 are identified as structure affected. Four are non title structure owner & 8 person affected as employees. 5 small trees need to be cut. No squatters are found in the proposed project site.

The out come of free prior public consultation was held on 7th May 2016 at Dubag union parisad Bhaban. They want proper compensation for their land structure and livelihood loss.

During the construction period dust, noise, air pollution, solid waste and sanitation, will create problem in the area for temporary period. Air and noise pollution will be significantly decrease in operation period after implementing international standard land port at Sheola by controlling vehicle and cargo using modern technology. A drainage line should be connected up to Gianikhal to discharge the rain water and other waste water from the port.

Based on the port operational point of view, the development option starting from zero line is more safe and secure. Considering security is the highest priority of the project in the Option, it is suggested that port improvement and detail resettlement action plan (RAP) need to be prepared.

EMP is to be carried out during implementation of the project to ensure contractors compliance with the mitigation measures along with the monitoring indicators and frequency. BLPA will be responsible for supervision of implementation of the plan.

ii. Social Impacts:

Social Impact Assessment Report (SIA) and Resettlement Action Plan ofSheola Land Port adequately addresses the land, assets, structures, community property resources livelihood, occupation and associated issues of project affected people. It incorporates principles and procedures for catering to entitlements and provision of required resources to deliver the compensation and assistance to PAPs and PAHs.

Entitlement matrix outlines the provision for the same. A major emphasis has been on reducing the potential direct negative impacts of the project affected people and adjacent areas. The social components were carefully addressed in the project design, along with technical, environmental, and economic considerations.

The study encompasses lots of information on different issues, not in depth, just an overview that may help to have an idea about the project area landscape. Another weakness of the study due to an unavailable cause is to establish the context of the issues which is interrelated might have cause-effect relationship.

According to field survey, some of the affected persons have double entitlements. It is estimated number of total affected persons will be 48. Due to Pre - Feasibility Survey (PFS), no formal RAP has been prepared and resettlement issues have been included in the social management plan (SMP). SMP will be implemented under establishing a RU unit during implementation period and at the time of post implementation period it will be converted to CSR department as a part of permanent structure.

Social and resettlement issues will be solved by hiring an implementing NGO for 12 months' period. There will be a provision monitoring, social and livelihood specialist with CSR department. NGO will prepare a monthly and final report regarding the completion of SMP.

A free prior informed public consultation meeting was held on 7th May 2016 with the local communities. Notices about the consultation meeting were circulated to the local communities through leaflets one week in advance of the meeting. Posters were also displayed at public places (at Union Parishad Bhavan, market). Additionally, meetings were also held with local government officials and customs officials. Outcome of the consultation are affected people will be happy and cooperate for the project implementation if they get proper compensation for their acquire land, structure and loss of livelihood. National consultation was also held on 10th August 16 at BLPA auditorium in Dhaka. Similarly project affected people request for proper compensation they have no objection project implementation.

The above discussion, it is clear that the necessity and the justification of a Social Management Plan (SMP). The project area is socially and naturally very active. In case of SMP some issues have been given priority for the increasing efforts of improving living standard of command area people.

6. Economic & Financial Analysis

i. Project Costs:

The entire improvement cost for Sheola land port is estimated as Taka 2907 million (equivalent to US$ 36.9 million). Among the cost items for improving Sheola land port, land acquisition comes out to be 9.49%.

The improvement is planned to be in two phases. The works plans to be done from 2016 to 2019 as the first phase and from 2024 to 2028 as the second phase. Around 69% of the costs will be invested in the first phase because of the high land acquisition cost.

Table 3 :Improvement Costs for Sheola Land Port

No.	Description	Total Cost		1st Phase cost		2nd Phase cost		Percentage	
		(1,000Tk)	(1,000$)	(1,000Tk)	(1,000$)	(1,000Tk)	(1,000$)	Phase-1	Phase-2
1	**Consultancy Services Cost**	**30,000**	**381**	**21,100**	**255**	**9,900**	**126**	67%	33%
2	**Land Cost**	**275,808**	**3,500**	**275,808**	**3,500**	**-**	**-**	100%	0%
	Land Acquisition	275,808	3,500	275,808	3,500	-	-		
3	**Development Cost**	**649,512**	**8,243**	**272,795**	**3,462**	**376,717**	**4,781**	42%	58%
4	**Building & Infrastructure**	**1,228,610**	**15,591**	**801,268**	**10,168**	**427,342**	**5,423**	65%	35%
	Port Facilities	1,042,297	13,227	614,955	7,804	427,342	5,423	59%	41%
	Service Area	186,313	2,364	186,313	2,364	-	-	100%	0%
5	**Basic Service Cost**	**165,109**	**2,095**	**111,585**	**1,416**	**53,524**	**679**	68%	32%
	External Electrification	147,885	1,877	100,562	1,276	47,323	601	68%	32%
	Ext. Water Supply/Sanitation	17,224	219	11,023	140	6,201	79	64%	36%
6	**Equipments and Plants**	**220,110**	**2,793**	**186,615**	**2368**	**33,495**	**425**	85%	15%
	Weighing Bridge (2 nos.)	60,610	769	30,305	385	30,305	385	50%	50%
	IT Solution (Networking, etc.)	55,000	698	53,900	684	1,100	14	98%	2%
	Port & freight management	104,500	1,326	102,410	1,300	2,090	27	98%	2%
7	**Safety & Security**	**182,119**	**2,311**	**178,476**	**2,265**	**3,642**	**46**	98%	20%
8	**Social impact mitigation cost**	**139,984**	**1,776**	**139,984**	**1,776**	-	**-**	100%	0%
9	**Environmental impact mitigation cost**	**15,865**	**201**	**6,346**	**81**	**9,519**	**121**	40%	60%
	Grand Total	**2,907,116**	**36,892**	**1,992,978**	**25,292**	**914,139**	**11,601**	69%	31%

ii. *Note*: 1 USD = 78.8 Taka

iii. Economic Analysis:

The results of cost-benefit analysis turn out to be as follows:

- internal rate of return (IRR) = 17 %;
- net present value (NPV) = USD 20.54 million
- cost benefit ratio (B/C ratio) = 1.87

Even though the effects of the improvement in immigration and quarantine facilities are not included, the project is estimated to be economically viable.

Sensibility analysis is made in the worst case: costs will be 20% higher and benefits 20% lower. In these conditions, IRR = 13.7 %, NPV = USD 7.02 million, B/C ratio = 1.25. It shows that the project is economically very good.

iv. Financial Analysis:

The results of cost-benefit analysis turn out to be as follows:

- financial internal rate of return (FIRR) = 15.3 %;
- financial net present value (FNPV) = USD 15.72 million
- profit index (PI) = 1.57

Even though the effects of the improvement in immigration and quarantine facilities are not included, the project is estimated to be financially viable.

Sensibility analysis is made in the worst case: costs will be 20% higher and revenues 20% lower. In these conditions, FIRR = 12 %, FNPV = USD 1.64million, PI = 1.05. It shows that the project is financially viable.

7. Conclusion

In conclusion, the improvement project of Sheola land port is economically and financially viable. The project will play an important role in promoting trade between Bangladesh and India on the hot economic corridor.

Even though there will be some environmental and social issues, those will be solved with mitigation measures recommended. BLPA as the implementation authority will monitor the adverse impacts with RAP and SAP.

All the risks involved in the implementation will be overcome while the implementation agency, BLPA, will monitor them in construction and operation periods.

Chapter 1: Introduction

1.1. Background of the Study/Project
1.2. The Project Area/Study Area
1.3. Project objectives
1.4. Scope of works
1.5. The study team
1.6. Study period
1.7. Study schedule
1.8. Reviewed reports

1.1. Back ground of the Study / Project

Bangladesh Land Port Authority (BLPA) has decided to develop a Land Port and to provide Landing Facilities at Beanibazar Upazila in Sylhet district. The location that has been selected is Sheola and it is located on the farthest North border of Bangladesh. The Indian part of the site is called Sutarkandi, which is situated under Karimganj district of Assam State.

The location is accessible from Sylhet district Head Quarter via road. Presently, the official activities of Customs Authority are conducted in a rented semi-pucca building at northern side of the Sylhet-Sheola road. On southern side of the road, the immigration office too, is situated in another semi-pucca building.

1.2. The Project Area /Study Area

Sheola is situated at Beanibazar Uapazila under Sylhet District. It is located at a distance of 13 kilometers from the Upazila Headquarter and 45 kilometers from Zila Headquarter. Land Customs Station in Sheola started functioning in 1948. In 1996, the L.C. station started its activities shifting to Borogram, two kilometers away from its original location and just adjacent to the border. Never the less, the name of the L.C station remained the same.

Just after the shifting, the comparative advantage of transportation through the river route was ruined. So, at present, the only way to get there directly is through road network. This location has been selected for further development as well as an equipped Land Port because of having good potential from both economic and social considerations. Presently, it is being used as a L.C. station through which various goods and commodities are transported to India and as well as to Bangladesh.

1.3. Project Objectives

Establishment of the land port will change the morphology of the area. The consequences of the project needs to be analyzed prior to initiation of the project. Keeping this in mind and according to ToR, the main objectives of this project have been set as:

(i) Preparing an evaluation of expected traffic (by traffic type) and evolution, for the initial operation of the border station and with an extrapolation for the next 20 years;

(ii) Preparing an evaluation of space requirements after drafting the staffing matrix showing the number of positions, hours of duty, accommodation needs in terms of office space, control positions, specialized facilities and housing and staff amenities;

(iii) Preparing a flow chart for the handling of the different categories of traffic, roles of Customs and other border agencies;

(iv) Preparing a (block) diagram showing traffic flows and location of the different functions and their position. Space requirements will be calculated according to traffic estimates, with a capacity for expansion according to future requirement;

(v) Detailed design & estimation of different infrastructures and bid documents for the land port;

(vi) Take in to account the possibility of co-located, juxtaposed and other models of enhanced collaboration for bilateral border management;

(vii) Drafting Initial Environmental Evaluations (IEEs), Environmental Impact Assessments (EIAs), and Environmental Management Plans (EMPs) for the proposed land ports; and

(viii) Draft Social Impact Assessments (SIAs), Resettlement Action Plans (RAPs), and where necessary, Indigenous /Tribal People's Development Plan for the land ports. The Consultant will also conduct consultations with broad stake holders on the proposed works and their environmental and social impacts and management measures, as well as vali date the draft designs with key stakeholders, before finalizing the studies.

Figure 1.1: Location of Sheola Land Port

1.4. Scope of Works

The process of feasibility study involves development and screening of alternatives and an analysis of a limited number of the most promising options to establish the basis for a selected decision. A range of viable alternatives have been developed during scoping. According to ToR of this study, the study involves the following major components:

- Preliminary Baseline: Assemble a preliminary (e.g. feasibility-stage) base line for each facility's site and its are a of influence, including areas of influence of likely associated/ linked infrastructure and activities, drawing on and supplementing any existing information on site conditions already assembled as part of the environmental and social screening in the EMF and SMF. The base line included Topography, Climate Conditions, Biological Conditions, Noise level and air quality, Land Use, Potentially-Affected Persons/ Households and
- Identifying and describing the known Physical Cultural Resources (historical, religious, or architectural) as well as socially sensitive are as like schools, bazaars, temples, etc.
- Traffic Surveys: Carryout traffic surveys in order to document existing traffic and develop traffic projections for generated and diverted traffic.
- Infrastructure Survey: Collect information on existing access and relevant infrastructure including roads, inland water ways, railways, border infrastructure including their capacity, condition, the traffic they currently carry, and required improvement to suit the proposed land port development for internal and cross-border traffic. Document/ propose any last-mile links/ infrastructure that is needed to be developed including river ports, access roads, parking areas, etc.
- Social Screening and Preliminary Social Impact: Collect demographic, population, and land holding information in order to estimate populations to be affected positively or negatively. Estimate land acquisition and resettlement need sand application of World Bank Operational Policy 4.12 and Government guidelines and legislation. Carryout Upazilla community consultation for identification of adverse impact sand tribal people is sues, and identify potential measures and technical options to minimize resettlement impact. Carryout consultation to with local population to identify their needs to prepare the Draft R&R Policy. Prepare initial cost estimate for land acquisition and resettlement, and for major components to quantify the social cost to be included in the project cost. Environmental Screening, Scoping and IEE: Based on the preliminary baseline characterization of environmental and social aspects of the project site as well as initial meetings and consultations with stakeholders, verify and update the ESMF's screening and scoping of key potential environmental and social impacts, and corresponding a voidance / minimization/ mitigation measures that should be incorporated in to the feasibility stage proposed design. At the same time, the scope of the work includes Document the preliminary baseline, initial assessment of potential impacts, and potential measures to avoid, minimize or mitigate such impacts in a format acceptable to GoB Department of Environment (DoE) for Initial Environmental Evaluation (IEE) and for purposes of receiving site clearances from DoE.
- Prepare the Lay out Plan and Master Plan for Sheola land port with the preliminary engineering designs for all the land port requirements: The scope for this study includes Design for land development, high security boundary walls, roads, drainages, functional buildings / offices for Customs and Land Port Authority, SPS functions/ labs

and other border agencies, warehouse, barracks for security personnel, open stack area, parking spaces, trans-loading bays, weighing yard, vehicle maintenance yard, toilets, canteen and cooking facilities, staff quarters and other utility buildings as well as necessary linked critical infrastructure including alternative designs for comparison purposes, and reflecting design adjustments and mitigations indicated by the environmental screening and scoping.

- Economic and Financial Analysis: Carry out comparative economic and financial analyses, sensitivity and risk analyses for design options/ alternatives and under different investment scenarios, considering construction and key impact mitigation and resettlement costs, rehabilitation and maintenance life cycle costs.
- Prepare the following out puts after the feasibility study:
  - Layout Plan and Master Plan of the land port design and linked critical infrastructure including justification for the proposed design based on the economic and financial analysis and inconsideration of social and environmental factors. Scope of this work includes a plan showing all the necessary infrastructure, equipment and service lines that are necessary to operate the land port, including the minimum required infrastructure to link each land port with
    i. Existing transport networks in Bangladesh (roads, river ports and /or rail) that service the current traffic the border,
    ii. The international border (at coordinates agreed between the countries), and
    iii. power, water and other basic services necessary to operate the facility, as well as structural measures as required to minimize, mitigate or manage environmental and social effects (for example, waste and waste water management facilities, drainage infrastructure, are as for a forestation/ refore station, sound barriers, etc.).
  - Feasibility level design drawings and reports with a content and format acceptable to the GoB and the World Bank.
  - Preliminary Social Impact Assessment for Sheola land port and associated infrastructure required to access and operate the port including demographic, population, and land holding information including the requirements for land acquisition, estimate of land to be acquired, estimate of affected household, estimate of displaced household, consultation, draft R&R policy, and budget Initial Environmental Evaluation/ Assessment for Sheola land port, including preliminary mitigation measures.

    Preparation of cost estimates and cost-benefit projection / analysis, including economic and financial analyses and sensitivity analyses.

    Preliminary project implementation plans including construction technology considerations as well as preliminary environmental and social minimization and mitigation considerations.

1.5. The Study Team

The study team is composed of group of the two Consultant's personnel. The group of Consultants comes from the association of the firms: Yooshin Engineering Corporation and VITTI Sthapati Brindo Ltd.

The Consultants of this association assigned to work in the study team have the broad based, extensive experience on the technical, particularly Feasibility studies, Detailed

Design and Environmental and social assessments of land ports. The key Professionals of the team are Team Leader / Port Engineer, Structural / Civil Engineer, Border Management/ Trade Facilitation Specialist, Architect, Urban and Regional planner,

Landscape planner, Transport Economist, Quantity Surveyor, Geotechnical Specialist, Environmental Specialist, Social Development Specialist, Sanitary Engineer, Electrical Engineer, Procurement / Contract specialist**.**

1.6. Study Period

The study period has been as set out in the contract agreement.

1.7. Study Schedule

It took a period of six months from signing of agreement to finalizing the report. Three phases composed the total study period namely survey, analysis and design. It took roughly two month at survey phase to collect all the information regarding the site. Analyses were made within the following one months and the remaining time was used to design, drawing and report preparation. Following table is showing the study schedule in a detailed form.

Table 1.1: Schedule of Feasibility Study for Sheola Area

SI	Project Phase/Events	Date
1	Signing of agreement with BLPA	23rdFebruary, 2016
2	Submission of Draft inception report	5th April, 2016
3	Presentation on Inception Report	13th April, 2016
4	Submission of Final Inception Report	5th May, 2016
5	Free Prior Public Consultation for Sheola LP in Dubagh Union parishad	7th may, 2016
6	Submission of Draft feasibility Study report of Sheola Land Port	20th may, 2016
7	Comments received from WB on Inception report	2nd June, 2016
8	Comments received from WB on feasibility Study report of Sheola land port. (Comments included only social, environmental and few civil engineering issues. No traffic and transportation issue was included)	5th June, 2016
9	Free Prior Public Consultation for Thegamukh LP in Rangamati	12th June, 2016
10	Response sent to WB regarding the comments on FS report of Sheola LP	20th June, 2016
11	Submission and presentation of Draft detailed design documents of Sheola LP	23rd June, 2016
12	Received official letter for two months' time extension from BLPA	26th June, 2016
13	Submission of Draft feasibility Study report on Bhomra and Thegamukh Land Port	28th June, 2016
14	Submission of Final detailed design documents of Sheola Land port	29th June, 2016
15	Eid Vacation	1st -9th July
16	Submission of Final feasibility Study report of Sheola Land Port incorporating WB comments	21st July, 2016
17	Another addition of Comment received from WB on feasibility Study on Sheola land port. (it includes additional comments on environmental issue)	14th July, 2016

18	Comments received from WB on feasibility Study report of Sheola land port. (Comments include only social, environmental and few civil engineering issues. Only one vague comment on traffic and transportation issue was included)	21st July, 2016
19	Meeting with WB personnel where first time consultants met the team leader of WB and got comments on transport forecast and traffic issue.	25th July, 2016
20	Comments received from WB on feasibility Study of Sheola, Bhomra and Thegamukh land port where for the first time consultants received comments regarding traffic and transportation issues. (In every section there were new comments which were never discussed before)	28th July, 2016
21	Environmental Management Framework (EMF) and Resettlement Policy Framework (RPF) has been received for the first time from MOS consultants	28th July, 2016
22	National Public Consultation for Sheola, Bhomra and Thegamukh LP in Dhaka	10th August
23	Free Prior Public Consultation for Bhomra LP in Bhomra	13th August
24	Submission of final FS report on Sheola land port incorporated with all WB comments	14th August, 2016
25	Submission of final FS report on Bhomra and Thegamukh land port incorporated with all WB comments	20th August, 2016
26	Submission of revised final FS report on Bhomra and Thegamukh land port incorporated with all WB comments	30th August, 2016

1.8. Reviewed Reports

To understand the project and for the preparation of Master Plan and Layout Plan, Detailed drawing and design of infrastructure and other allied facilities, information on these reports has been reviewed to develop a conceptual understanding of the project and limitation of development opportunities. Reports are collected from BLPA, BIWTA, R&H Department, LGED, related project office and the library of the consultants:

a) Annual Ports & Traffic Report, BIWTA, September 1999.

b) Annual Traffic Report 1967-68, East Pakistan Inland Water Transport Authority, March 1970.

c) Feasibility Report on development of Secondary Inland Port at Ghorasal, Pakistan British and Pakistan National consultants January 1970.

d) Towards Sustainable Development: The National Conservancy Strategy of Bangladesh, Ministry of Environment and Forest, GOB and International Union for Conservation of Nature and Natural Resources, July 1991.

e) Principles and Practice of Town and Country Planning by Lewis Keeble: The Estates Gazette Limited, 151, WardourStree, London, 1969.

f) Final Report for the Study on the Development Project of Dhaka and Narayanganj Ports in the Peoples' Republic of Bangladesh, Main Report, 1987: Japan International Cooperation Agency.

g) Inception Report for the Dhaka Port Development Project, M/S Pacific Consultants International, Tokyo, Japan in association with M/S Development Consultancy

Services Ltd, Dhaka, Bangladesh, January, 1995, BIWTA (OECF LOAN NO. BD-P33).

h) Traffic Survey Report for "Introduction of Waterways Around Dhaka City, 1st Phase: Improvement of Navigability and Providing Landing Facilities from Sadarghat to Ashulia Bridge" Project, Consultants: M/S DUL, ACE & MEPC, Dhaka, 2001.

i) National Land Transport Policy, 2004, Ministry of Communications, GoB.

j) Dhaka Metropolitan Development Plan (DMDP, 1997) reports containing Structure Plan (1995-20I5) & Urban Area Plan (1995-2005), RAJUK, MoH&PW, GoB.

k) Report of Strategic Transport Plan (STP, 2005, Dhaka Transport Coordination Board).

l) Road Transport and Traffic Act, 2012, GoB.

m) Accelerating Growth, Empowering Citizens; 7th 5 Year Plan, GED, Planning Commission, GoB.

n) Bhattacharya, D., & Hossain, S. S. (2006). An Evaluation of the Need and Cost f Selected Trade Facilitation Measures in Bangladesh: Implications for the WTO Negotiations on Trade Facilitation. Dhaka: Asia Pacific Research and Training Network on Trade.

o) DIER. (2007). Traffic Impact Assessments (TIA) Guideline. Tasmania: Department of Infrastructure, Energy and Resources, Roads & Traffic Division, Tasmania. Retrieved September 18, 2015, from

http: //www.transport.tas.gov.au/__data/assets/pdf_file/0005/108491/TIA_Framework_Edition_1_09-2007_Final.pdf

p) ITE. (1991). Traffic Access and Impact Studies for Site Development: A Recommended Practice. Washington, D.C.: Institute of Traffic Engineers.

q) RDP. (2015). Dhaka Structure Plan (Draft), 2016-2035. Dhaka: RAJUK.

r) STP. (2007). The Strategic Transport Plan (STP) for Dhaka. Dhaka: Dhaka Transport Coordination Board (DTCB).

Chapter 2: Addressing Growth Potential for Focal Areas

2.1 Major Socio-economic Indicators of Bangladesh

2.2 Export and Import Trends in Bangladesh

2.3 Current Situation of Bangladesh Land Ports

2.4 New Strategies for Export-led Growth in the 7th Five Year Plan

2.5 Summary and Implications

2.1. Major Socio-economic Indicators of Bangladesh

Economic growth of Bangladesh was more or less resilient in the last few Fiscal Years despite political instability which hindered exports and private investment. Further growth is expected to edge up in the next couple of years on steady expansion in garment exports. The demographic dividend with some associated factors supported this expansion of economy. This expansion will have some effect on the scenario of the land port. The main socio-economic indicators relating to LP are pointed out below.

2.1.1. Population

Total population of Bangladesh has increased at a growth rate of 1.2% per year since 2005 that amounted a 159 million in 2015. Table 2.1 shows the population trend of Bangladesh since 2005.

Table 2.1: Population Trends of Bangladesh Unit: (1,000 people)

Year	2005	2007	2009	2011	2013	2015	Growth Rate
Population	143,135	146,457	149,503	152,862	156,595	159,850	1.2%

Source: UNESCAP Statistics Homepage, http: //www.unescap.org

Male and female population by region of Bangladesh is tabulated in Table 2.2. Sheola Land Port is located in Sylhet Division where male shares 49.80% of the total population (4.934 million) and female shares 50.20% (4.975 million).

Table 2.2: Population by Region in Bangladesh 2011

Name of Zila (District)		Population (Thousand)		
		Male	Female	Total
Rangpur Division		7,879	7,906	15,785
Rajshahi Division		9,256	9,226	18,482
Khulna Division		7,844	7,844	15,688
Barisal Division		4,088	4,236	8,324
Dhaka Division		24,171	23,252	47,423
Chittagong Division		13,934	14,487	28,421
Sylhet Division		4,934	4,975	9,909
Districts of Sylhet Division	Sunamganj	1,236	1,231	2,467
	Sylhet	1,727	1,707	3,434
	Moulvibazar	945	974	1,919
	Habiganj	1,026	1,063	2,089

Source: "2011 Population & Housing Census: Preliminary Results", BBS.

2.1.2. Number of Registered Vehicle

The number of registered vehicles in Bangladesh was 2,142,083 in 2014 and has increased at the growth rate of 10.4% annually from 2009 to 2014. Except the item of 'Others', the growth rate of covered Utility (Jeep and Pick-up) reached the highest of

14.6%, followed by that of motorcycles which has the total registered number of 1,151,954. Following table is showing the accounts of registered vehicles in Bangladesh since 2009.

Table 2.3: Registered Vehicle Trends in Bangladesh (unit: Thousand and %)

Type of Vehicle		2009	2010	2011	2012	2013	2014	Growth rate
Bus	Large Bus	26.02	27.78	29.54	30.98	32.09	33.57	5.2%
	Micro/Mini	108.89	121.06	129.45	135.40	142.18	151.74	6.9%
Tractor		16.86	20.60	25.80	29.29	31.18	32.70	14.2%
Truck	Heavy Truck	8.28	9.08	9.79	10.21	10.66	11.20	6.2%
	Truck	73.34	82.87	90.20	94.53	99.66	107.80	8.0%
Car	Passenger Car	241.23	264.21	277.24	286.63	297.15	312.23	5.3%
	Utility (Jeep and Pick-up)	53.44	64.53	77.12	86.31	94.18	105.61	14.6%
Motor Cycle		650.15	759.26	873.87	975.46	1061.27	1151.95	12.1%
Auto Rickshaw and Tempo		122.41	141.03	161.63	185.80	201.89	222.29	12.7%
Cart		5.85	6.52	7.67	8.39	8.77	9.00	9.0%
Others		0.93	1.32	1.32	1.33	2.41	4.00	33.8%
Total		1307.39	1498.24	1683.63	1844.34	1981.44	2142.08	10.4%

Source: Statistical Year Book of Bangladesh, 2014

2.1.3. Economic Growth

Bangladesh has kept the growth rate of 6% to 7% despite some of negative factors such as domestic political instability and sluggish export growth amid the international economic recession. The IMF forecasted the economic growth rate of Bangladesh in 2020 as 8.0%. Table 4.4 shows the projected economic growth rate of some countries including Bangladesh. The table explains that, from 2013 to 2019, Bangladesh economy will predictably grow at a higher rate compared to most of the economies of the world.

Table 2.4: Projected Economic Growth Rate of Bangladesh and Other Countries
[GDP at constant prices (% change)]

Classification	2013	2014	2015	2016*	2017*	2018*	2019*	2020*
World	3.3	3.3	3.8	4.0	4.1	4.0	4.0	NA
Advanced Economies	1.4	1.8	2.3	2.4	2.4	2.3	2.3	NA
Euro Zone	-0.4	0.8	1.3	1.7	1.7	1.6	1.6	NA
Emerging / Developing Economies	4.7	4.4	5	5.2	5.2	5.2	5.2	NA
Developing Asia	6.6	6.5	6.6	6.5	6.5	6.4	6.3	NA
GDP of Bangladesh and neighboring countries (% change)								
Bangladesh	**6.0**	**6.1**	**6.5**	**7.0**	**7.2**	**7.4**	**7.6**	**8.0**
India	5.0	5.9	7.5	8.1	8.5	9	9.5	10.0
China	7.7	7.4	7.1	6.8	6.6	6.4	6.3	NA

Source: IMF (2015)

* estimated

2.2. Export and Import Trends in Bangladesh

2.2.1. Current Trade Status of Bangladesh and Forecast of Trade

The amount of exports in Bangladesh grew at an average rate of 8.01% annually and amount of imports grew at an average annual growth of 4.79%. Deficit of trade balance in Bangladesh decreased at an average 3.33% annually during 2010 to 2015. Table 2.6 suggests that volume of export has been expected to increase at a rate of 12.0% and trade balance would be reduced at a rate of 13.3% in 2020. Table 2.7 and 2.8 are showing the major export and import partners of Bangladesh.

Table 2.5: Export and Import of Bangladesh (million USD)

Contents		2010/11	2011/12	2012/13	2013/14	2014/15	Growth rate
Export	Amount	22,928	24,302	27,027	30,187	31,209	8.01%
	Growth rate (%)	41.5	6.0	11.2	11.7	3.4	
Import	Amount	33,658	35,516	34,084	40,732	40,579	4.79%
	Growth rate (%)	41.80	5.5	-4.0	19.4	-0.4	
Trade Balance		-10,730	-11,214	-6,954	-10,506	-9,370	-3.33%

Source: 1) Export Promotion Bureau of Bangladesh (www.epb.gov.bd)
2) Central Bank of Bangladesh (www.bangladesh-bank.org)

Table 2.6: Prospect of Export and Import in Bangladesh (million USD, %)

Contents		2015	2016	2017	2018	2019	2020	Growth rate
Export	Amount	30,700	33,800	37,500	42,000	47,500	54,100	12.0
	Growth rate	3.0	10.2	11.0	12.0	13.0	14.0	
Import	Amount	40,700	45,400	50,500	56,700	64,000	72,800	12.1
	Growth rate	12.1	10.6	11.2	12.3	12.8	13.8	
Trade Balance		-10,000	-11,600	-13,000	-14,700	-16,500	-18,700	13.3

Sources: 1) GED, Ministry of Finance and Seventh Plan Projections
2) Central Bank of Bangladesh (www.bangladesh-bank.org)

Table 2.7: Current Export Partners of Bangladesh (million USD, %)

No	2011			2012			2013			2014		
	Country	Export Volume	Rate	Country	Export Volume	Rate	Country	Export Volume	Rate	Country	Export Volume	Rate
1	USA	5101	21.0	USA	5419	20.1	USA	5584	18.5	USA	5783	18.5
2	Germany	3689	15.2	Germany	3963	14.7	Germany	4720	15.6	Germany	4705	15.1
3	UK	2445	10.1	UK	2765	10.2	UK	2918	9.7	UK	3205	10.3
4	France	1380	5.7	France	1514	5.6	France	1678	5.6	Spain	1754	5.6
5	Spain	1148	4.7	Spain	1301	4.8	Spain	1616	5.4	France	1744	5.6
6	Canada	994	4.1	Canada	1090	4	Italy	1332	4.4	Italy	1382	4.4
7	Italy	977	4.0	Italy	1037	3.8	Canada	1100	3.6	Canada	1029	3.3
8	Belgium	742	3.1	Japan	750	2.8	Belgium	971	3.2	Belgium	975	3.1
9	Netherlands	691	2.8	Belgium	731	2.7	Japan	862	2.9	Japan	915	2.9
10	Japan	600	2.5	Netherlands	713	2.6	Netherlands	858	2.8	Netherlands	840	2.7
-	Others	6520	26.8	Others	7735	28.6	Others	8538	28.3	Others	8866	28.4
-	Total	24287	100	Total	27018	100	Total	30177	100	Total	31198	100

Source: Export Promotion Bureau of Bangladesh (EPB) (www.epb.gov.bd)

The major import partnering countries of Bangladesh are China (22.0%), India (15.6%), and Singapore (5.9%) based on the financial year of 2014/15. But a very small volume of goods are exported to these countries. So, there is a chance to enhance the growth of export (as there is an existing trade relation) in these countries to reduce the trade balance.

Table 2.8: Current Import Partners of Bangladesh (million USD, %)

No.	2011			2012			2013			2014		
	Country	Export Volume	Rate	Country	Export Volume	Rate	Country	Export Volume	Rate	Country	Export Volume	Rate
1	China	6,490	19.3	China	6,446	20.0	China	7,541	20.7	China	8,232	22.0
2	India	4,801	14.2	India	4,867	15.1	India	6,036	16.6	India	5,828	15.6
3	Singapore	1,725	5.1	Malaysia	1,944	6.0	Singapore	2,290	6.3	Singapore	2,199	5.9
4	Korea	1,568	4.7	Singapore	1,449	4.5	Malaysia	2,042	5.6	Japan	1,524	4.1
5	Japan	1,470	4.4	Korea	1,322	4.1	Japan	1,284	3.5	Indonesia	1,398	3.7
6	Malaysia	1,412	4.2	Japan	1,204	3.7	Korea	1,199	3.3	Malaysia	1,300	3.5
7	Kuwait	1,310	3.9	Kuwait	1,075	3.3	Indonesia	1,104	3.0	Korea	1,223	3.3
8	Indonesia	1,239	3.7	Taiwan	991	3.1	Brazil	998	2.7	Brazil	928	2.5
9	Brazil	1,207	3.6	Indonesia	816	2.5	Taiwan	919	2.5	Kuwait	860	2.3
10	Taiwan	805	2.4	Brazil	749	2.3	Kuwait	915	2.5	Hongkong	852	2.3
-	Others	11,669	34.6	Others	11,322	35.2	Others	8,586	23.5	Others	9,141	24.4
-	Total	33,694	100.0	Total	32,184	100.0	Total	36,441	100.0	Total	37,424	100.0

Source: Central Bank of Bangladesh (www.bangladesh-bank.org)
Note 1) Statistics are aggregated from total import except import of EPZ

2.2.2. Major import and Export Item in Bangladesh

Bangladesh's main export items are primary commodities (Frozen food, Agricultural products) and the garment industry products (Jute goods, Knit-wears, Woven garments, Home textile). Knitware and likewise RMG products are exported at a far more quantity than the others. Following table is showing the composition of export in the last couple of years with the volume of exports during 2009 to 2013.

Table 2.9: Major Export Commodities of Bangladesh (million USD)

Product	2009-2010	2010-2011	2011-2012	2012-2013
A. Primary Commodities	**687.53**	**958.98**	**1,001.12**	**1,079.58**
(1) Frozen Food	445.18	625.04	598.42	543.84
a) Frozen Fish	89.12	133.53	108.05	57.99
b) Shrimps	348.28	477.83	471.67	454.93
c) Others	7.78	13.68	18.70	30.92
(2) Agricultural Products	242.35	333.94	402.70	535.74
a) Tea	5.65	3.20	3.38	2.44
b) Vegetables	46.84	71.73	77.43	110.34
c) Tobacco	52.26	70.88	68.74	60.18
d) Cut Flower & Foliage	39.84	42.89	50.46	41.43
e) Fruits	17.37	37.68	57.16	71.89

Product	2009-2010	2010-2011	2011-2012	2012-2013
f) Spices	6.94	9.24	13.68	21.13
g) Dry Food	20.95	29.37	37.19	45.24
h) Others	52.50	68.95	94.66	183.09
B. Manufactured Commodities	**15,517.12**	**21,969.24**	**23,300.78**	**25,947.78**
(1) Cement, Salt, Stone Etc	19.52	18.63	14.58	6.15
(2) Ores, Slag and Ash	11.47	29.18	27.96	22.37
(3) Petroleum bi Products	301.15	260.68	275.44	313.95
(4) Chemical Products	102.87	104.76	103.01	93.01
a) Pharmaceuticals	40.97	44.27	48.25	59.82
b) Chemical Fertilizer	38.55	39.53	17.64	-
c) Cosmetics	0.28	0.33	1.06	0.77
d) Others	23.07	20.63	36.06	32.42
(5) Plastic Products	50.63	68.76	88.69	84.51
a) PVC Bags	27.96	27.26	31.26	32.00
b) Plastic Waste	15.69	31.58	43.42	39.09
c) Others	6.98	9.92	14.01	13.42
(6) Rubber	9.69	20.66	16.23	13.57
(7) Leather	226.10	297.83	330.16	399.73
(8) Leather Product	29.06	55.42	99.36	161.62
(9) Wood & Wood Products	2.18	1.29	1.25	1.71
(10) Handicrafts	3.79	4.47	4.78	6.16
(11) Pulp	0.03	0.01	-	0.01
(12) Paper & Paper Products	18.88	26.33	27.75	33.73
(13) Printed Materials	1.62	1.66	1.58	1.39
(14) Silk	0.03	0.03	0.01	0.18
(15) Wool & Woolen Products	0.10	0.57	0.61	0.16
(16) Cotton & Cotton Product (Yarn, Waste, Fabrics etc)	95.23	135.01	113.00	124.96
(17) Jute & Jute goods	787.99	1114.93	967.38	1030.61
a) Raw Jute	196.27	357.28	266.28	229.92
b) Jute Yarn & Twine	397.69	500.66	468.15	506.74
c) Jute Sacks & Bags	136.79	167.47	185.26	237.42
d) Others	57.24	50.27	47.69	56.53
(18) Man Made Filaments & Staple Fibres	77.18	95.75	81.39	101.45
(19) Carpet	8.06	7.50	6.23	8.46
(20) Specialized Textiles	185.97	164.55	138.77	124.52
a) Terry Towel	157.07	120.13	92.11	81.96
b) Special Woven Fabric	8.22	11.75	10.93	10.93

Product	2009-2010	2010-2011	2011-2012	2012-2013
c) Knitted Fabrics	20.68	26.16	30.86	24.01
d) Other	-	6.51	4.87	7.62
(21) Knitwear	6,483.29	9,482.06	9,486.39	10,475.88
(22) Woven Garments	6013.43	8432.40	9603.34	11,039.85
(23) Home Textile	402.49	788.76	906.07	791.52
(24) Footwear	204.09	297.80	335.51	419.32
(25) Headgear/Cap	36.63	54.10	53.23	47.69
(26) Umbrella Waking Sticks	-	0.03	-	0.01
(27) Wigs & Human Hair	1.03	2.12	6.76	9.14
(28) Building Materials	0.30	0.21	0.32	1.91
(29) Ceramic Products	30.78	37.58	33.75	37.69
(30) Glass & Glass ware	5.94	1.44	0.37	0.16
(31) Engineering Products	311.09	309.55	375.49	367.47
a) Iron Steel	60.42	69.79	59.73	56.81
b) Copper Wire	110.86	65.04	50.93	66.38
c) Stainless Steel ware	26.11	2.43	3.20	1.58
d) Engineering Equipment	23.20	36.03	49.54	48.73
e) Electric Products	49.23	26.07	88.53	63.09
f) Bicycle	2.67	99.83	105.59	105.08
g) Others	38.60	10.36	17.97	25.80
(32) Ships, boats & floating structures	9.34	40.44	45.95	5.73
(33) Other MFD Products	54.57	69.42	84.61	121.53
a) Optical, Photographic, Medical Instruments etc	14.86	28.40	34.64	50.33
b) Furniture	19.26	21.38	27.14	31.41
c) Golf Shaft	11.18	8.71	9.79	15.15
d) Others	9.27	10.93	13.04	24.64
(34) Computer Services	35.36	45.31	70.81	101.63

Source: Export Promotion Bureau of Bangladesh (EPB) (www.epb.gov.bd)

Bangladesh's main import items are raw materials (Iron, steel and other base metals) and fabric materials (Polyester, Textile, Raw cotton and yam etc.).Following table is showing the major import commodities of Bangladesh from 2009 to 2013.

Table 2.10: Major import Commodities of Bangladesh (million USD)

Serial No.	Commodity	2009-2010	2010-2011	2011-2012	2012-2013
1.	Rice	75	830	288	30
2.	Wheat	762	1,081	613	696
3.	Milk & cream	106	161	221	214
4.	Spices	109	127	138	118
5.	Oils seeds	130	103	177	242
6.	Edible oil	1,050	1,067	1,644	1,402
7.	Pulses all sorts	350	292	243	422
8.	Sugar	650	654	1177	731
9.	Clinker	333	446	504	487
10.	Crude petroleum	535	923	987	1,102
11.	POL	2,021	3,186	3,922	3,642
12.	Chemical	972	1,254	1,210	1,302
13.	Pharmaceutical products	103	116	119	119
14.	Fertilizer	717	1,241	1,381	1,188
15.	Dyeing, tanning etc. materials	275	333	375	399
16.	Plastics and rubber articles thereof	966	1,302	1,366	1,366
17.	Raw cotton	1,439	2,689	2,084	2,005
18.	Yarn	718	1,391	1,384	1,356
19.	Textile and articles thereof	1,986	2,680	3,023	3,273
20.	Staple fiber	118	180	428	455
21.	Iron, steel and other base metals	1,453	2,004	2,224	2,335
22.	Capital machinery	1,595	2,325	2,005	1,835
23.	Others	5,862	7,132	7,889	6,860
24.	Sub Total	22,325	31,517	33,402	31,579
Imports of EPZ		1,413	2,141	2,114	2,505
Grand Total:		23,738	33,658	35,516	34,084

Source: Central Bank of Bangladesh (www.bangladesh-bank.org)

Note 1) Statistics are aggregated from total import except import of EPZ

2.2.3. Current State of Import and Export between Bangladesh-India

The volume of trade between Bangladesh and India is increasing with an annual average rate of 14.55%. From the data presented in the following table, it is evident that, trade imbalance between the two countries has increased in the course of time. Total deficit shows an average annual increase of 15.27%.

Table 2.11: Current Status of Bilateral Trade (million USD)

Contents	2008	2010	2012	2014	Growth rate (%)
Export from BD to India (A)	275.67	512.51	563.96	527.16	11.41%
Import Volume from India to BD (B)	2512.27	4150.87	4866.71	5773.09	14.87%
Deficit Volume to India (A-B)	-2236.6	-3638.36	-4302.75	-5245.93	15.27%
Total Trade Volume	2787.95	4663.37	5430.67	6300.26	14.55%

Sources: 1) Export Promotion Bureau of Bangladesh (www.epb.gov.bd)
2) Central Bank of Bangladesh (www.bangladesh-bank.org)

2.3. Current Situation of Land Ports in Bangladesh

There are 20 land ports along the border between Bangladesh and India. Ten land ports are now operating and the rest ones are being developed in line with economic development strategies of the '7th Five Year Plan'. The particulars of the inland ports in Bangladesh (for the year 2014) has been shown in Table below. Benapole Land Port has been found to handle most of the Inland freight volume and as well as it is the largest land port in Bangladesh. Figure 2.1 shows the locations of land ports and as well as some of the particulars of them.

Table 2.12: List of Land Ports in Bangladesh

LP No	Name of Land Port	Bangladesh side	Indian side	Date of operation	Land area (Acre)
1	Benapole	Benapole/Sharshe/ Jessore	Petrapole/Bongaon/ 24-Parganas/ West Bengal	February 01, 2002	60.78
2	Burimari	Burimari/Patgram/Lal monirhat	Changrabandha/Mekhaliganj/ West Bengal	April 09, 2010	11.15
3	Akhaura	Akhaura/Brahmnbaria	Ramnagar/Agartala/Tripura	August 13, 2010	15.00
4	SonaMosjid	Sonamosjid/ChapaiNawabganj	Mahadipur/Maldah/West Bengal	December 27, 2006	19.13
5	Hili	Hili/Hakimpur/Dinajpur	Hili/South Dinajpur/West Bengal	November 26, 2007	10.00
6	Banglabandha	Tetulia/Panchagarh	Fulbari/Jalpaiguri/West Bengal	October 09, 2005	10.00
7	Teknaf	Teknaf/Cox's Bazar	Mungdu/Myanmar	November 01, 2006	24.00

LP No	Name of Land Port	Bangladesh side	Indian side	Date of operation	Land area (Acre)
8	Bibirbazar	SadarUpazila/Comilla	Srimantapur	April 23, 2009	10.00
9	Birol	Birol/Dinajpur	Radhikapur (Goura)/West Bengal	October 22, 2006	17.54
10	Bhomra	SadarUpazila/Satkhira	Gojadanga/24-Parganas/ West Bengal	May, 2013	15.73
11	Nakugoan	Nalitabari/Sherpur	Dalu/Barangapara/Meghalaya	yet to start	13.46
12	Tamabil	Gowinghat/Sylhet	Dauki/Shillong/Meghalaya	yet to start	14.72
13	Darshana	Damurhuda/Chuadanga	Gede/Krishnanagar/ West Bengal	yet to start	-
14	Belonia	Feni	Belonia/Tripura	yet to start	7.42
15	Gobrakura& Koroitali	Haluaghat/Mymensingh	Gachhuapara/Tura/Meghalaya	yet to start	37.13
16	Ramgarh	Ramgarh/Khagrachhari	Sabroom/Tripura	yet to start	10.24
17	Sonahat	Bhurungamari/Kurigram	Sonahat/Dhubri/Assam	yet to start	14.68
18	Tegamukh	Tegamukh/Barkal/Rangamati	Demaagri/Mizoram	yet to start	-
19	Chilahati	Chilahati/Domar/ Nilphamari	Holdibari/Cooch Behar/ West Bengal	yet to start	-
20	Daulatganj	Daulatganj/Jibon Nagar/Chuadanga	Mazdia/Nadia/West Bengal	yet to start	-

Source: Bangladesh Land Port Authority (BLPA), 2016

Figure 2.1: Location Map of Inland Ports in Bangladesh

Source: BLPA, 2016

2.4. New Strategies for Export-led Growth in the 7th Five Year Plan

In the 7th five year plan of the government of Bangladesh, a strategy for diversification of exports must include a policy package that is multifaceted and comprehensive covering

- constraints at the borders,
- behind the borders (supply side), and
- beyond the borders (market access issues).

Addressing constraints at the borders implies a focus on tariff and non-tariff barriers to imports and exports, as well as better customs facilitation; against a background of appropriate macroeconomic framework (including low inflation, realistic exchange rate, low fiscal and external deficits), anti-export bias policies, and measures to mitigate adverse social consequences of reforms needed to align domestic to international prices.

Addressing constraints behind the borders implies addressing supply side constraints (Infrastructure, trade-related Institutions, policy constraints, including adequate business regulatory framework), competitiveness constraints (standards, packaging, quality, and delivery in time), and needed support incentives (fiscal incentives and credit incentives) for export diversification, including emphasis on R&D for developing improved products or moving up the value chain.

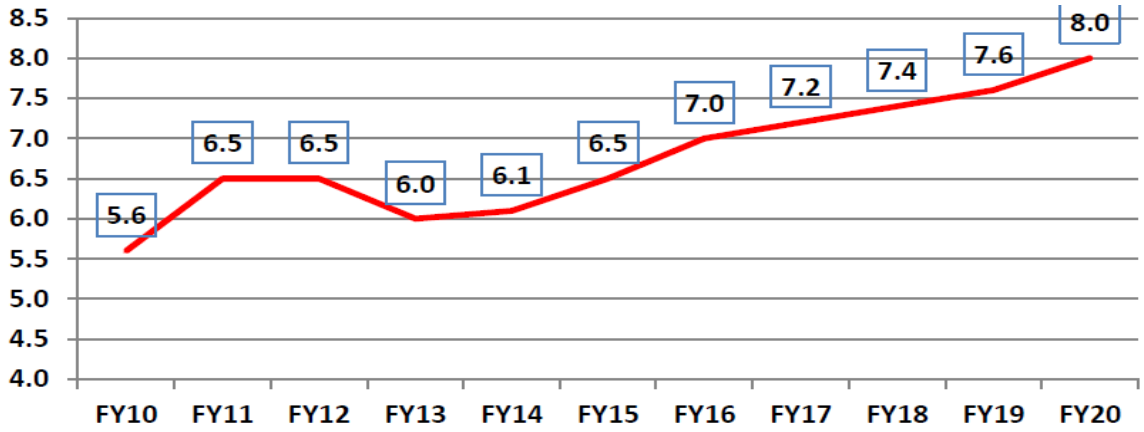
Addressing constraints beyond the borders implies addressing market access barriers to export growth. By and large, expanding exports to respond to increased regional and global market demands requires increased production (supply) of goods and services in many sectors (agriculture, industry, services).

The emergence of intermediate goods in Bangladesh's export basket is an area that has been given more attention. Without this, issues that have been given attention are:

- stable political environment Efficient Containerization
- Efficient Land Ports
- Information and Communication Technology
- Export Processing Zones or Special Economic Zones

Targets of average annual growth rate has been set as 7.4% during the plan period. The 7th Five Year Plan will strive to achieve this target rate of growth on a sustainable basis as illustrated in Figure 2.2.The target for achieving 8.0% growth rate conforms to the projection of IMF shown in Table 2.4.

Figure 2.2: GDP Growth Targets in 7th Five Year Plan



Source: 7th Five Year Plan, FY2016~FY2020, November 2015

2.5. Summary and Implications

The trend of export and import between India and Bangladesh shows that the gap between export and import (trade balance) is rising that is a result of increasing import at a higher rate than export. The other macroeconomic indicators of Bangladesh is showing a progressive scenario. Thus, in the near future, the land ports will play a vital role while reshaping the economy. All of these issues has been addressed in the seventh five year plan that is assuming a further growth of GDP and as well as economy.

Chapter 3: Current Situation

3.1. Introduction

3.2. Historical Overview

3.3. Border Management and Trade Facilitation Issues

3.4. Multi-modal Connectivity to Sheola Land Port

3.5. Regional Connectivity

3.6. Existing Physical Conditions

3.7. Existing Operational Conditions

3.8. Export and Import through Sheola Land Port

3.9. Summary and Implications

3.1. Introduction

Sheola Land Port is located at the North-Eastern border of Bangladesh. It is located at about 13 km east of Beanibazar Upazila Parishad and it has an area of 10.83 acres. The site is situated adjacent to the river Kushiyara and has a physical location of 24°52'22.33" (N) and 92°14'48.84" (E). The nearest town from the place is Karimganj district of India which is 12 km away towards East. There is an availability of basic infrastructures like electricity, telephone (OTD), road, drinking water etc. in the said Port Area.

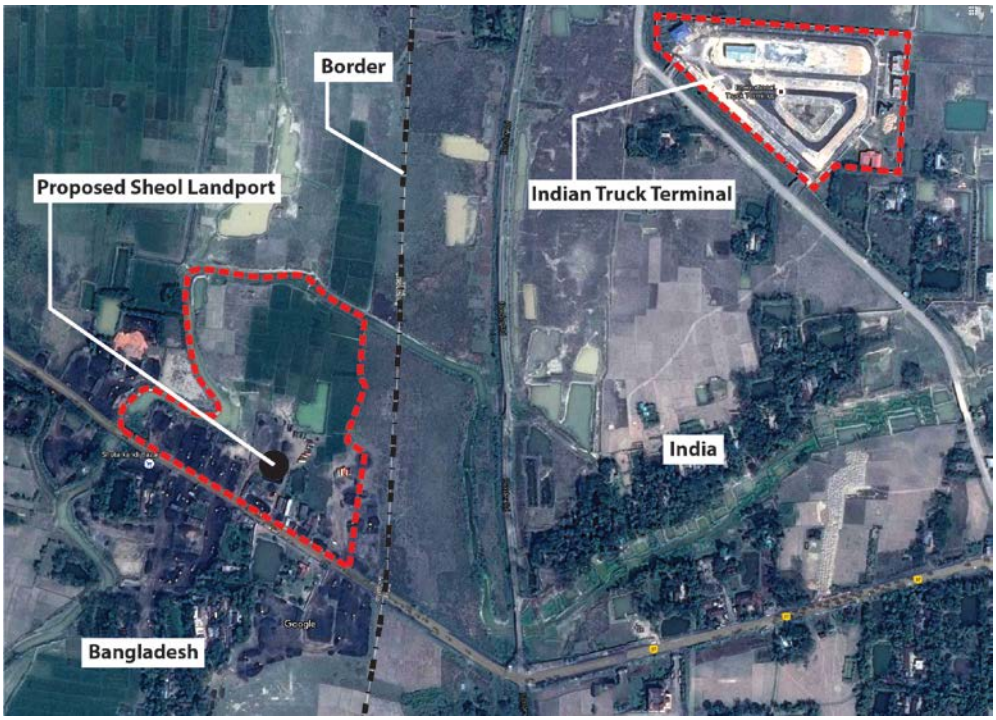
Present road network from Sylhet to Sheola Land Customs Station has been constructed by the LGED and most of the roads are paved and narrow. There is a 16 km paved road between the LC station and Karimganj. The distance from Sheola/Sutarkandi to Gouhati, capital of Assam is 264km.

Figure 3.1: The Project area at present

Source: Prepared by the Consultant using Aerial Photograph

There is an immigration check post on 1.3 acre land with a semi-pucca building situated near the Zero point. But the official activities of customs are conducted from a rented Semi-Pucca building. Electricity connection is available in this LC station.

Figure 3.2: Location of Sheola in Satellite image



Source: Field Survey Data and Image of Google Earth

3.2. Historical Overview

After the partition of India, in 1947, cross border trade developed between the then East Pakistan and India on the North-East portion of Bangladesh. Export-import activities used to take place using Kushiyara River. These import-export were done though land-customs station. Later on, when road communication developed from Karimganj to Sutarkandi and finally to Beanibazar, the land customs station shifted 2kilometers south to Borogram.

Nevertheless, the name of this land port remained the same. Since, bringing goods from Karimganj was easier though road communication, the import and export through Kushiyara river stopped. People of Borogram and sutarkandi got involved in the coal trade and as a result, private yards took the place of stacking to accommodate the coal trade.

During that time, customs used to inspect every imported shipment, causing delays in process and harassment to importers. To counter this, GoB introduced the use of Pre-Shipment Inspection (PSI) in February 2000. Although it was introduced on a voluntary basis in 1993, it was made mandatory on 15 February 2001. The designated PSI companies were given responsibilities to certify the price, quantity and HS codes. Introducing the PSI system substantially reduced the harassment faced by importers and reduced the customs clearance.

Today, PSI verifies unit prices, examines and reports the quantity and quality of exports before they are sent to the importing country. The evolvement of PSI ensured fair cross border trade administration by controlling over-invoicing or under-invoicing of imports, misclassification of imports, under-collection of taxes on imports, misappropriation of funds, and compliance with national regulations.

3.3. Border Management and Trade Facilitation Issues

The border of Bangladesh has diversity with plains, hills, forest and rivers (Canal, low lying water body or marshes etc.); which is managed by different Government Authorities like Bangladesh Land Port Authority (BLPA), Customs, Immigration and Border Guard Bangladesh (BGB) including the Clearing & Forwarding (C&F) agencies. All these agencies have the following common challenges(Bhattacharya & Hossain, 2006):

- **Border control** checks illegal trades and human trafficking, controls cross border crimes, surveillance and monitor socio-economic situation, collects border intelligence on border area
- **Detecting and investigating** “cross-border crime” and bilateral border issues in cooperation with all the relevant law enforcement authorities
- **Access control** in the border, including measures in third countries of origin or transit, cooperation with neighboring countries, measures on border control at the external borders and control measures within the common area
- **Inter-agency and cross-border cooperation** in border management including border guards, customs and police, national security and other relevant authorities
- **Coordination and coherence** at the national and transnational level
- Issue of **bilateral trade.**

The guiding principles inspiring these five dimensions seem to be that 'border management' of the common border must be 'integrated' and must cover all border related issues that Bangladesh is supposed to face.

The Potential Benefit of Trade Facilitation results from three intangible factor scenario (port efficiency, customs environment, domestic regulatory framework and one tangible aspect of service/security organization's infrastructure). Bangladesh accrues the highest percentage gain (32.5%) in terms of exports due to improvement in ports. Considering the services sector infrastructure in South Asia, the countries gain the most (20.0%) as exporter, and Bangladesh accrues the highest within the region in percentage (30.6%). Reforms in the regulatory environment have led Bangladesh to obtain the maximum percentage gain (68.3%) within South Asia(Bhattacharya & Hossain, 2006).

It is evident that Bangladesh's export performance has been experiencing ups and downs during the last two decades. In this context, major challenges for the country's exports competitiveness can be identified as follows:

- Rules and regulations have not been as conducive to international trade as expected by the business community.
- Timely notification of relevant and required amendments to existing laws has hardly been done to facilitate trade. Furthermore, there is hardly any scope for the private sector to participate in the policy formulations by way of providing suggestions through mutual discussions.
- Customs valuation and tariff classification ambiguities have long been a major concern for the private sector.
- Pervasiveness of corruption among the customs personnel is another major factor that raises the costs of doing business in Bangladesh.
- Inefficiency of the government bureaucracy has always been a major bottleneck for the country's international trade.

Trade facilitation is also essential for small and medium size enterprises, which are the backbone of the manufacturing sector and employment in the country. The business costs are higher for small and medium size enterprises compared to large ones. Again, these costs also include compliance with import and export procedures, which are much lower for larger firms than that of small enterprises.

It is thus imperative for Bangladesh to overcome the above mentioned issues of border management and trade facilitation with due policy planning and by providing capacity building programs, which are the present time need for the conceptual and physical development of both.

Considering the real needs for export growth and export diversification, Bangladesh has undertaken a number of trade facilitation measures in recent years. The following measures have been initiated during the last decade:

- Development of Land ports
- Development of E-Commerce
- Development of New Terminal
- Inland River Container Terminal and Multi-modal Transport
- Improving Capacity of the Chittagong Port, especially in container handling.

3.3.1. Border Management at Bangladesh Border Side

Major Border activities of the security forces of Bangladesh comprises of foot and standing patrols, observation and listening posts, vehicle control/check points, reaction force and follow up operations and depth operations (Road Blocks to a depth of 8.1 km to the rear of the borderline in conjunction with other law enforcing agencies) in addition to intelligence operations to collect information on illegal and cross border activities.

To increase the domination in the area as well as to facilitate the trade, travel or tours and to have better surveillance in the area new BGB Battalion was raised at Beanibazar in 2015. One more Border Guard Battalion is going to be deployed in Kulaura shortly to enhance the present border situation.

3.3.2. Border Management at Indian Border Side

Opposite to Sheola, Border Security Force (BSF) of India has their camp just at 300 meter east of the border line on the right side of the only border connecting road of the area. In fact, this is a sub unit (Company) Head Quarter (HQ) along with its 100 persons. They have tin-shed building for accommodation and office. They perform same like BGB who checks out last and checks in first of any individual, items or vehicles going out or coming in to Indian territory.

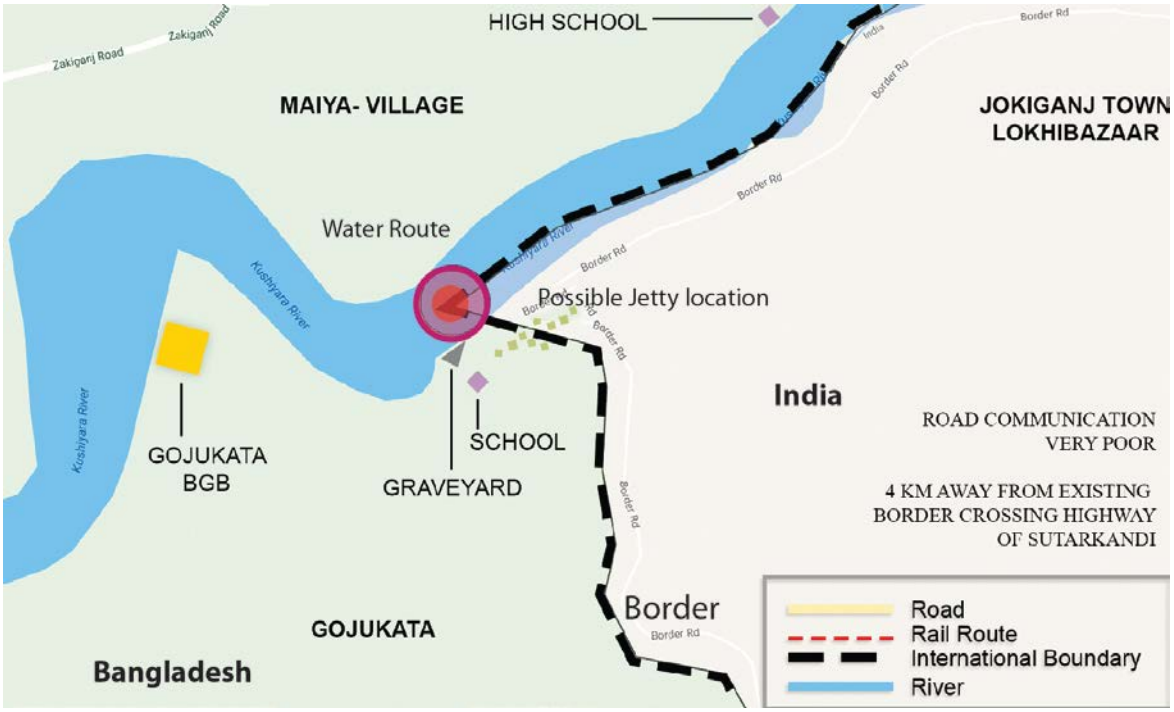
3.4. Multi-modal Connectivity to Sheola Land Port

At present, Sheola Land Port is connected by road network only. However, there was an operational railway track before the partition at a 10 kilometers distance at south of Sheola. The route was used for transportation even twenty years ago (1995).There is a river route at five kilometer north of Sheola without any Jetty or port facility. Moreover this is having better navigation and mobility of river crafts with load in rainy season or monsoon period from the month of June to September (4 months only). As a result, road is the only option now for having an access to the site. Detailed situation can be shown in the maps and pictures below.

Figure 3.3: The routes (Water, Rail and Road)surrounding the Land Port Area

Source: Google Map

Figure 3.4: Map showing the Bordrline and Kushiyara River



Source: Google Map

Figure 3.5: Exising situation in and around the river

Source: Field Survey

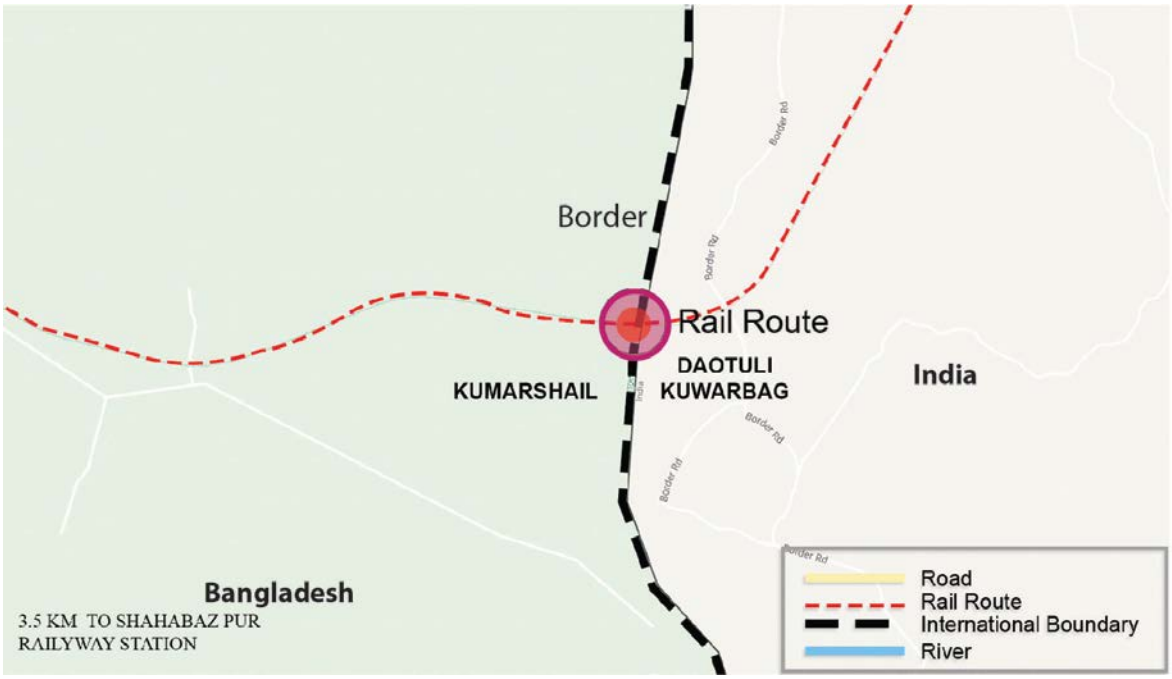
The site of Land Port has been selected at the present place of Land Port's operation but it is suggested to link both of the route (Railway and Waterway) with the existing location. To do so, a road is to be built from the point where the river entered into Bangladesh to

the point where the railway line entered into Bangladesh. This will keep the opportunity alive using those routes if required. The following figures are showing detailed information of the areas.

Figure 3.6: Map showing road network, customs and immegration facilities

Source: Google Map

Figure 3.7: Map showing the cross-border abandoned railway network



Source: Google Map

Figure 3.8: Existing situation of the Railway Track and Railway Station

Source: Field Survey

Comparison of Single Mode and Multimodal Options

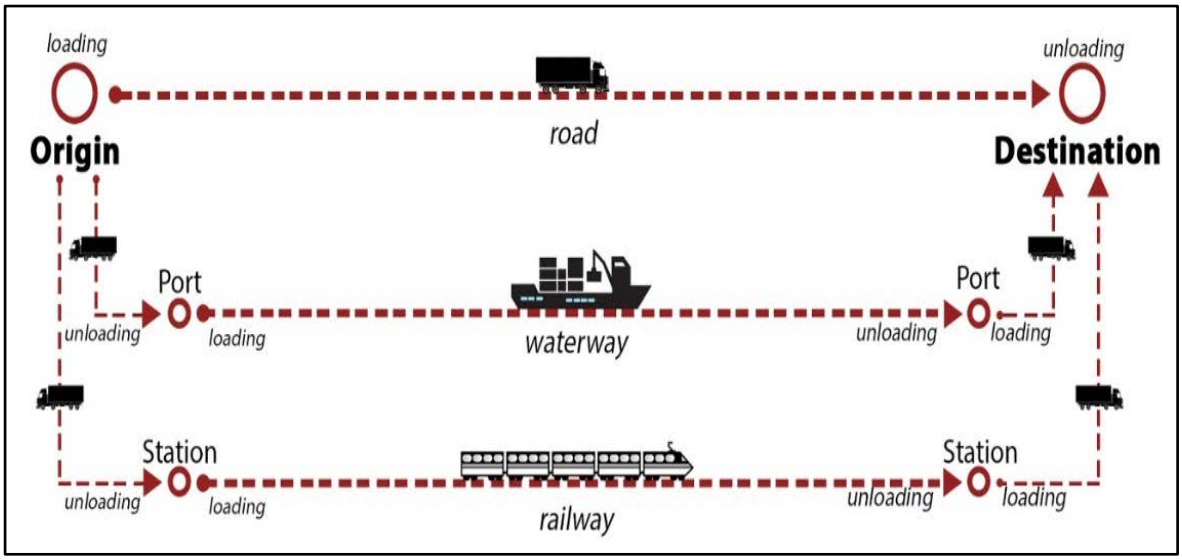
Is there any possibility to introduce multimodal transport routes nearby the existing Sheola land port? Before analyzing geographical and physical conditions along the corridor, some practical issues related to logistics should be taken into account as follows:

- Multi-modal transport in logistics is not likely to be in conductive for almost all goods. Time and costs are caused by the procedure of transferring from one mode to another mode of transport. Loading, unloading, and storage of goods in the transferring procedure are big burden for delivering goods from origin to destination for delivery of any goods (figure 3.9).
- Always higher amount of investments are required at every transferring point. The investments may include loading, unloading, storage and supporting facilities together with access roads to the transferring point. If infrastructure of road or railway or river on the corridor is not good enough, additional investment had to be added.

Current situation of the transport corridor in which Sheola land port is located is that:

- Railway line was demolished and not operated even though it existed in the past. Relinking the railway line may cause GoBand India huge amount of investment facilities with logistics and new stations.
- Kushiyara river route was operational in the past even though it is now closed. If the route should be recovered, huge amount of investment may be caused for river port facilities, access roads, and for securing the river route by dredging works that should be done every year.

Figure 3.9: Comparison of Activities in Single- and Multi-modal Options



Source: Developed by the Consultant

- Because there is a national border in the corridors, additional facilities like customs, immigration, and quarantine facilities with related agreement between governments of Bangladesh and India. Making the agreement between the two countries would require quite a bit of time.
- In spite of the constraint described above, if the export/import characteristics on the corridor fulfill basic conditions for multi-modal transport such as (1) the origins and destinations of the goods are not dispersed, (2) the transport distances are long enough[1] to deploy multi-modal transport (road ~ railway or river ~ road), multimodal transport options should be deeply investigated.

In conclusion, because Sheola land port exists on the road corridor and the O-D characteristics of goods are not proper to introduce multimodal transport in the corridor, this project, Improvement of Sheola land port, is focusing on the current location of Sheola land port.

It is recommended that multimodal transport routes will be developed in view of the efficient international transport for goods movement with enough time and costs under agreement among relevant countries.

3.5. Regional Connectivity

3.5.1. Bangladesh

Road transport

A trade route for coal has come up which helped local traders around Sutarkandi to develop business. On the Indian side a large Indian truck terminal has been built to facilitate this trading. In current scenario, Indian trucks bring coal and offload manually. In private yards inside Bangladesh. There is an existing customs/immigration office which does the paper works for this trucks and cargo.

[1] If the transport distance is shorter than 300 km, road transport is much more competitive than the other modes such as railway, inland waterway, etc. If the transport distance is longer than 1,000 km, multi-modal transport seems to be competitive in practical point of view.

Railway

In Bangladesh Side, Shahbazpur was connected to Sylhet at a distance of 54 kilometers and this railway line crossed border at $24^0$48'17" North and $92^0$16'26" East. This rail line has reached Karimganj which is at 19 kilometers North of Shahbajpur. That point of border is at a distance of 15 kilometers from Shahbazpur.

Water transport

From the O-D survey it can be derived that the major coal distribution is used in the brick fields at the outskirts of Sylhet city. Approximately 67% of the total coal imported through Sheola cross border trade. The nearest water route to this cross border is the Kushiyara. River which streams by 4km of the existing cross border trading place. Kushiyara streams down south west moving far away from Sylhet which is the major consumer of the imported coal. No major road communication is available alongside for further coal transportation.

3.5.2. India

Road transport

The major road link up to the district of Karimganj is National Highway 44 at Indian portion which starts from Shillong in Meghalaya and after passing through Karimganj, goes down to Agartala in Tripura state. It also provides a major intra-district communication backbone as it covers a stretch of more than 83 kilometers in Karimganj district.

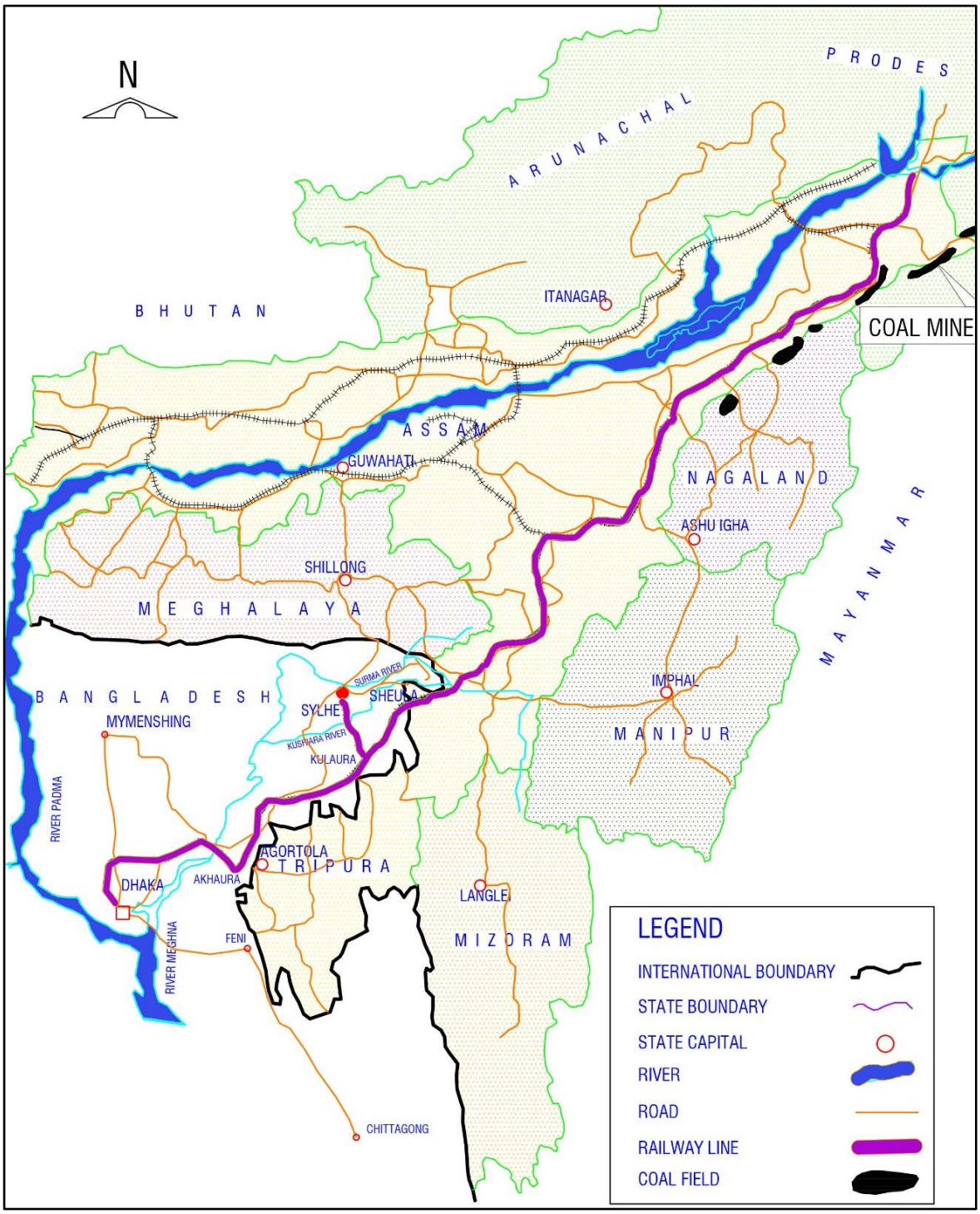
After entering through Karimganj-Hailakandi border at Badarpurghat, it connects important places like Badarpur, Karimganj Town, Nilambazar, Patherkandi, Lowairpoa etc, before entering Tripura at Churaibari. Karimganj is connected to Sutarkandi (opposite to Sheola) with another National Highway (National Highway no. 37).

Rail

Before 1947, in the pre-independence era, Karimganj Railway station was a major hub of rail communication for the whole of Sylhet, Assam and present North-East states of India having a rail link into Shahbajpur of Bangladesh. After 1947, the main rail link was sealed and Karimganj railway junction lost much of its importance. A train service was operated through this truncated rail-link from Karimganj Junction to the border station of Mahishasan which is just at a distance of 12 Kilometers from Karimganj. The borderline is at 3 kilometers West of Mahishasan Railway Station.

Badarpur, in Karimganj district is still now the major railway junction and main hub in the entire Barak Valley and southern Assam. Direct train services are available to Guwahati, Lumding, Silchar, Dharmanagar-Kumarghat (in Tripura), Bhairabi (in Mizoram). Silchar-Badarpur-Karimganj-Dharmanagar train service is also an important railway service. Despite the rising popularity of the road transport system this has lost much of its importance in the last few years. Rail links also exists between Karimganj and Dullavcherra through Baraigram Junction.

Figure 3.10: Integrated Transportation Network



Source: Prepared by the Consultant

Water transport

Karimganj is situated by the side of Kushiyara River that connects Shilchar at the East. This river was a route for transportation of coal and other materials transporting to Bangladesh and further. Coal withdrawn from mines used to be transported to Karimganj via road and after that, the river route was used for transportation of coal.

River transportation link exists between Karimganj and Kolkata through Bangladesh. Central Inland Water Transport Corporation maintains jetty and warehouse at Karimganj Town by the side of Kushiyara River for handling and storage of cargo carried by steamers by this route. Although this provides a very competitive mode of cargo transportation, the service has largely been an irregular one.

While selecting the present location of installing Sheola land port, this issue of connectivity was regarded as the primary one. The amount of coal that is imported from India is not bulk in amount because this is used primarily as fuel in the brickfields and thus it is not viable to use railway network for that. In addition, the water transport network remains navigable for four months of the year only. So, considering all of the circumstances, consultants suggests an improvement of land port in its existing location.

3.6. Existing Physical Conditions

3.6.1. Bangladesh Border side

Sheola ICP is operating with yards under open sky in private owned land leased by the coal traders. There is no shed available for goods & trucks. BGB has a temporary tiny office immediately short of the borderline. Immigration police has a tin shed barrack and office complex surrounded by constructed wall. Customs, BLPA and C&F doesn't have any office complex. Items for quarantine or contraband items cannot be stored in secured storage.

Existing major infrastructure of Sheola LC compromises of the following:

- Total no. shed: 0
- Total no. of Gov. open yard: 0
- Total no. of private yard: 5
- Indian truck terminal: 0
- Transshipment yard: 0

- ***Warehouse & shed complex***

Currently there is no Warehouse or shed. In Sheola the trucks are unloaded at privately owned yards. The handling process in and out of the trucks are manual. Labor by head carrying. The feedback from stakeholder is that there is no port equipment to provide good service.

- ***Hazardous goods***

From the schedule of imported goods through Sheola Land Customs station, it has been found that, no hazardous goods such as chemical or toxic goods are transported through this port.

- ***Indian truck terminal***

Since BLPA is not operational in Sheola, hence there is no Indian truck terminal in Bangladesh side. All the Indians trucks use to make a queue in the road while the concerned authority process customs documentation.

- ***Immigration***

The immigration office/check post occupies 1.3 acre of land fenced with a high boundary wall.

- ***Safety & security***

The security personnel at Sheola are composed of regular 30BGBpersons. They have a shifting duty. For immigration purpose, there are seven (7) member from Ansarto ensure security. The BGB personnel are deployed at the border check post.

- ***Fire Fighting System***

There is no formal firefighting arrangement in Sheola though the major portion of import is composed of coal, which is highly flammable. Traders depend on water from the adjacent canal or pond in such type of incidence.

- ***Border crossing***

The area border crossing for goods and passengers vehicle is not fenced. There is a BGB check post located about 20 m from the border crossing.

The border crossing is open daily from6 am to 6 pm. except for Friday. Sheola customs operating hours at the border gate is 9 am to4 pm during weekday and remains closed on weekends (Friday & Saturday) and public holidays.

There are two import-export season. The peak season ranges from August to April and off season ranges from Mayto August. During the peak season, on an average around 31 Indian and 14 Bangladeshi trucks crosses border daily and during off season around 15 Indian and 10 Bangladeshi truck crosses border. There is a “no man’s land” between Bangladesh and Indian gate.

- ***Sub Soil Condition***

The purpose of soil exploration is to find out strength characteristics of the Sub-Soil over which the Structure will have to be built. The soil exploration provided the necessary data to evaluate the following:

- The safe Bearing Capacity of Soil.
- The location of Ground Water Table.
- The choice and Depth of Foundation.

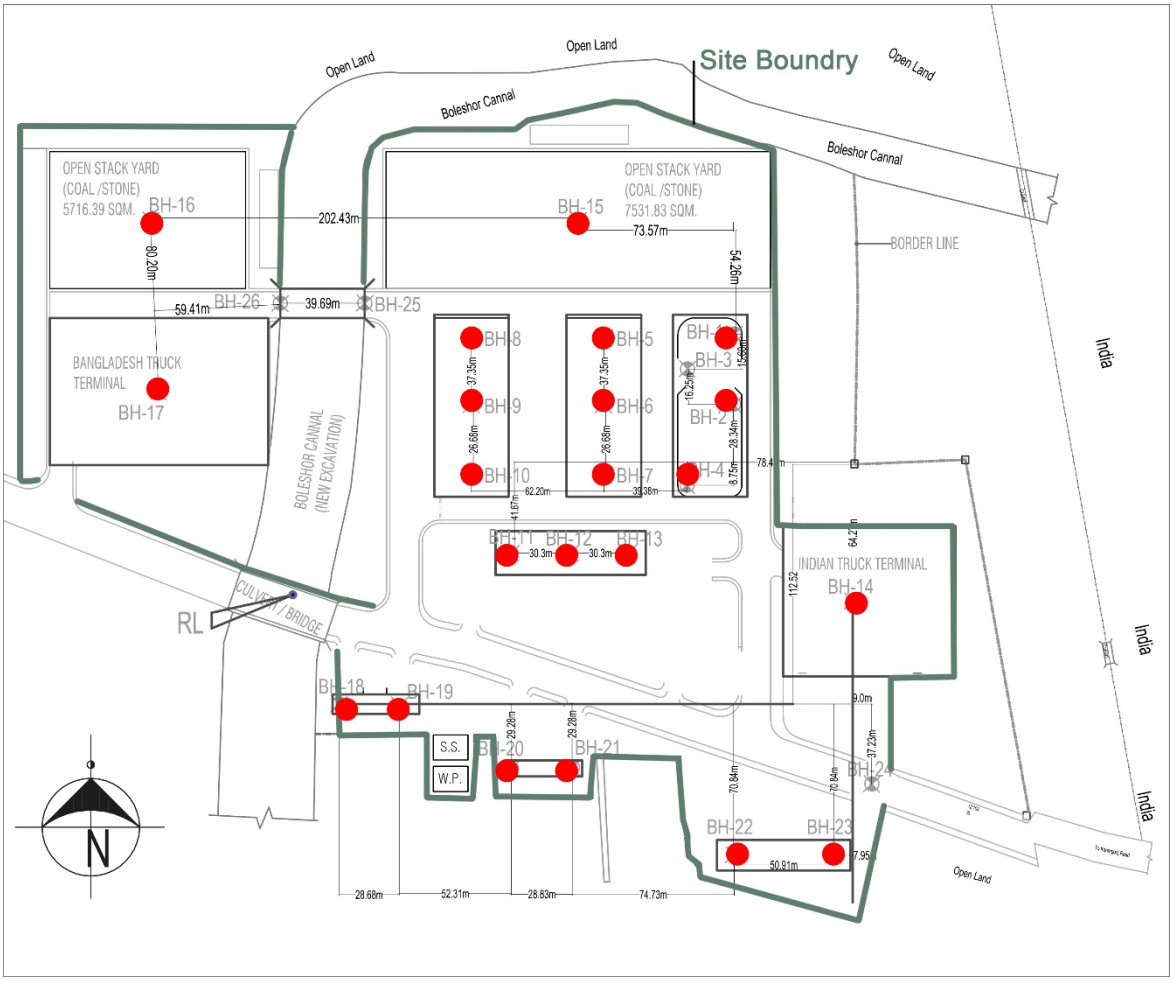
The examination consisted of Twenty-Six (26) numbers of Exploratory Bore Holes (location shown in the enclosed layout plan) up to maximum depth of 36.30m below ground surface.

The Standard Penetration Tests were performed at first 1.50m then 2.00m then 3.00m then at every 1.50m (5′) intervals up to the final depth of every boreholes. 305 nos. of Disturbed Soil Samples were extracted at every Standard Penetration Test point and 13 nos. of Undisturbed Soil Samples were extracted at Cohesive Zone from the thirteen boreholes.

The Ground Water Table at Bore Holes was measured after 24 hours from completion of Boring Works. The Depth of Water has been found at Project Area was

- (+) 1.80m for BH-1 to BH-10, BH-14 to BH-16, BH-25 & BH-26,
- (+) 1.20m for BH-13, BH-17 & BH-19 to BH-21,
- (+) 0.90m for BH-22,
- (-) 0.30m for BH-11 & BH-12 and
- (-) 0.60m for BH-18, BH-23 & BH-24 from the EGL.

Figure 3.11: Location of Borehole for sub-soil investigation



Source: Field Survey

The findings based on field boring exploration & laboratory investigation are recorded as below.

The first layer of soil up to the Depth of 2.10m from EGL consists of Brown very loose SILT, some fine sand non plastic. But in BH-18 to BH-21, BH-23 & BH-24 consists of Rubbish max depth of 2.30m from EGL. In other Bore Holes Grey / Dark Grey / Brown / Brownish soft to medium stiff Clay, trace fine sand, medium to high plastic max depth of 31.90m from EGL. In BH-4 & BH-23 Finally followed by whitish dense to very dense Fine Sand, trace silt, trace mica, non-plastic in nature up to the final boring depth.

- The soil compactness of each respective layer is more or less regular.
- The sub-soil formation is almost homogeneous.

Based on the above conclusions, the followings are the recommendations for the proposed project of land port.

- The deep foundation including R.C.C (pre-cast) pile should be provided.

Types of foundation depends on the load type and spanning of the structure. Various types of structures are there like

1) Shallow foundation of a) Single footing, b) Combined footing and may be c) Raft for 2/3 storied structure like Guest House, Dormitory, Pump House and Gate (See table 3.1.)

2) Precast pile for Boundary wall, Guest House, Dormitory, Pump House and Gate etc. (See table 3.1.)

3) Cast in situe pile of structure like Large Building, Trans Shipment yard, Warehouse, Bridge etc. 500 or 600 mm dia pile of length 30.00 to 50.00 m may be used (See table 3.1.)

The allowable carrying capacities (F.S = 3.0) of different diameter & the embedment length of pile from EGL are given as follows.

Table 3.1: Allowable Carrying Capacity in different size

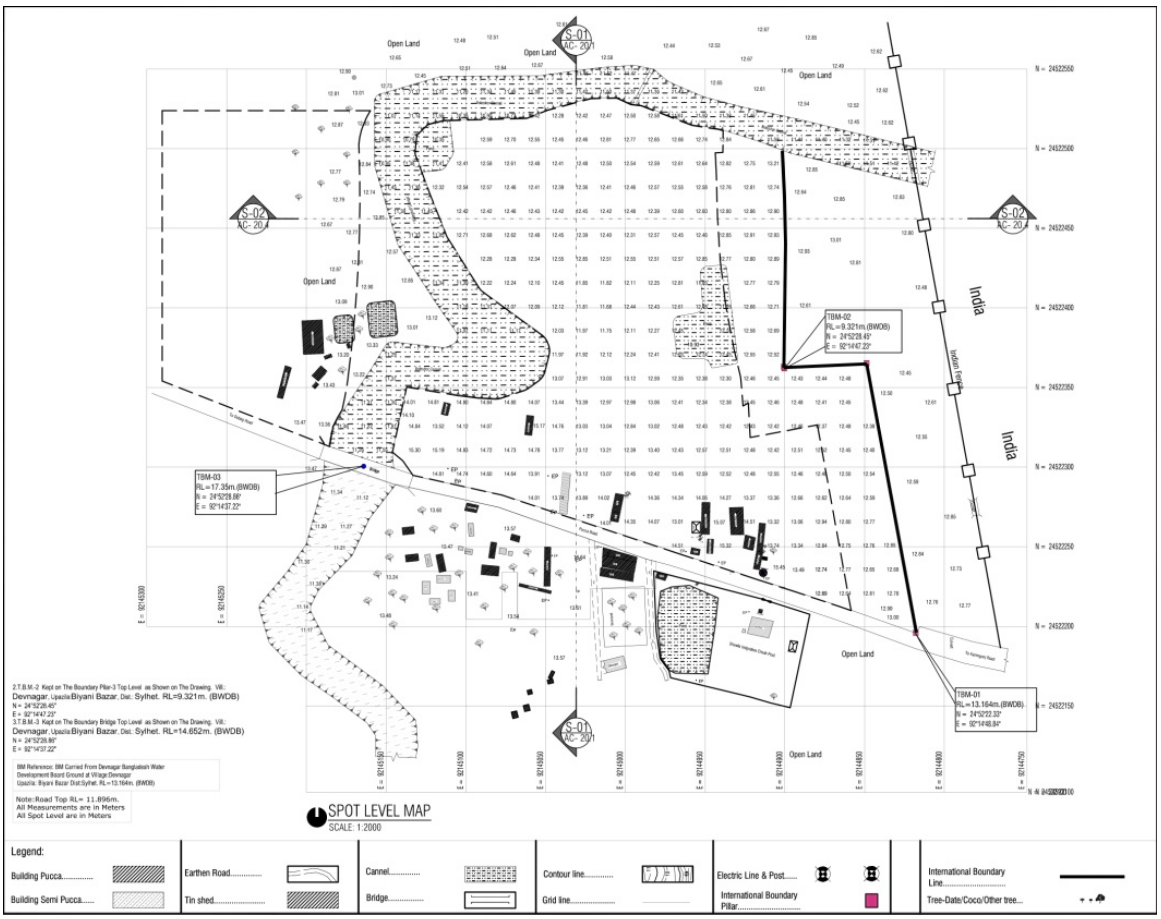
Length	Size In mm	Carrying Capacity	Size In mm	Carrying Capacity	Size In mm	Carrying Capacity
13.50m (BH-1)	300X300	62 KN (6 Ton)	350X350	75 KN (8 Ton)	400X400	87 KN (9 Ton)
13.50m (BH-2)	300X300	65 KN (7 Ton)	350X350	78 KN (8 Ton)	400X400	91 KN (9 Ton)
12.00m (BH-3)	300X300	60 KN (6 Ton)	350X350	72 KN (7 Ton)	400X400	86 KN (9 Ton)
15.00m (BH-4)	300X300	62 KN (6 Ton)	350X350	75 KN (8 Ton)	400X400	89 KN (9 Ton)
12.00m (BH-5)	300X300	54 KN (6 Ton)	350X350	65 KN (7 Ton)	400X400	77 KN (8 Ton)
15.00m (BH-6)	300X300	66 KN (7 Ton)	350X350	79 KN (8 Ton)	400X400	92 KN (9 Ton)
15.00m (BH-7)	300X300	66 KN (7 Ton)	350X350	79 KN (8 Ton)	400X400	92 KN (9 Ton)
15.00m (BH-8)	300X300	62 KN (6 Ton)	350X350	74 KN (8 Ton)	400X400	87 KN (9 Ton)
13.50m (BH-9)	300X300	40 KN (4 Ton)	350X350	48 KN (5 Ton)	400X400	57 KN (6 Ton)
13.50m (BH-10)	300X300	49 KN (5 Ton)	350X350	58 KN (6 Ton)	400X400	69 KN (7 Ton)
10.50m (BH-11)	300X300	52 KN (5 Ton)	350X350	64 KN (7 Ton)	400X400	76 KN (8 Ton)
10.50m (BH-12)	300X300	54 KN (6 Ton)	350X350	64 KN (7 Ton)	400X400	76 KN (9 Ton)
12.00m (BH-13)	300X300	55 KN (6 Ton)	350X350	66 KN (7 Ton)	400X400	77 KN (8 Ton)
12.00m (BH-14)	300X300	64 KN (7 Ton)	350X350	77 KN (8 Ton)	400X400	91 KN (9 Ton)
9.00m (BH-15)	300X300	56 KN (6 Ton)	350X350	68 KN (7 Ton)	400X400	81 KN (8 Ton)
12.00m (BH-16)	300X300	47 KN (5 Ton)	350X350	57 KN (6 Ton)	400X400	67 KN (7 Ton)
15.00m (BH-17)	300X300	40 KN (4 Ton)	350X350	49 KN (5 Ton)	400X400	59 KN (6 Ton)
12.00m (BH-18)	300X300	57 KN (6 Ton)	350X350	69 KN (7 Ton)	400X400	82 KN (8 Ton)
12.00m (BH-19)	300X300	60 KN (6 Ton)	350X350	72 KN (7 Ton)	400X400	84 KN (9 Ton)
13.50m (BH-20)	300X300	54 KN (6 Ton)	350X350	64 KN (7 Ton)	400X400	76 KN (8 Ton)
10.50m (BH-21)	300X300	40 KN (4 Ton)	350X350	48 KN (5 Ton)	400X400	57 KN (6 Ton)
10.50m (BH-22)	300X300	42 KN (4 Ton)	350X350	51 KN (5 Ton)	400X400	60 KN (6 Ton)
15.00m (BH-23)	300X300	56 KN (6 Ton)	350X350	67 KN (7 Ton)	400X400	79 KN (8 Ton)
13.50m (BH-24)	300X300	62 KN (6 Ton)	350X350	75 KN (7 Ton)	400X400	87 KN (9 Ton)
10.50m (BH-25)	300X300	43 KN (4 Ton)	350X350	53 KN (5 Ton)	400X400	62 KN (6 Ton)
15.00m (BH-26)	300X300	73 KN (7 Ton)	350X350	87 KN (9 Ton)	400X400	102 KN (10 Ton)

Source: Field Survey

- ***Hydrology of Adjacent Canal***

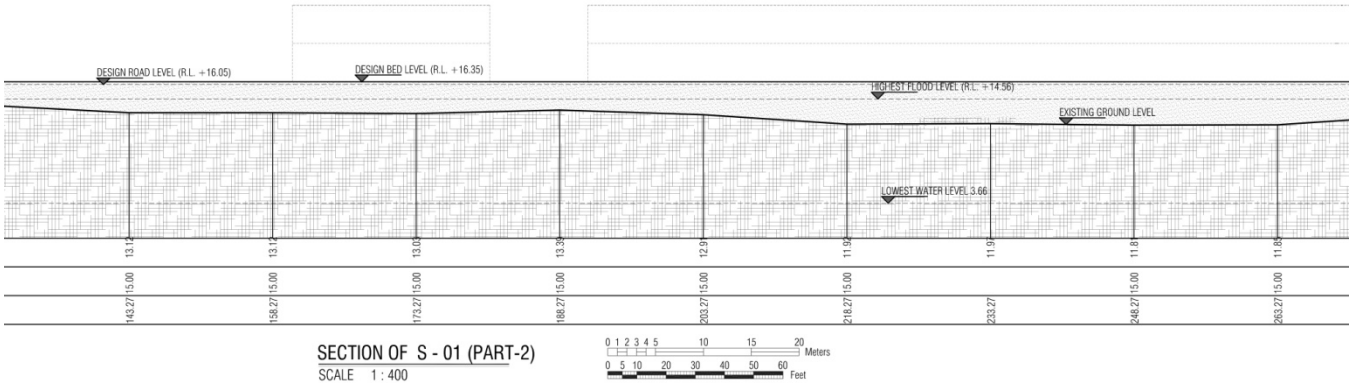
There is a canal at on the North West edge of the side. At present we have to cross this channel by a bridge to reach the site. The canal has active flow only in monsoon and there is almost no flow in winter. Currently it is a shallow water channel which we are reviewing in our proposed design. The existing channel of the site has very little trace of water. Nevertheless, an assessment of hydrological study is performed. Besides, the consultants propose to re-direct the sharp curvature of this inactive channel and ensure the smooth flow during the monsoon.

Figure 3.12: Spot height of the site and alignment of canal (existing and proposed)



Source: Survey of Bangladesh, 2016

Figure 3.13: Cross Section of the canal



Source: Survey of Bangladesh, 2016

Hydrological data station for Sheola is situated on Kushiyara River and very near to the project. As such, this station of BWDB represents the project. Both water level and as well as discharge data has been collected from BWDB. Table 3.2shows the list of the data collected. The location of the station has been shown in Fig- 3.14.

Table 3.2: Collected Water level and discharge data of Kushiyara River

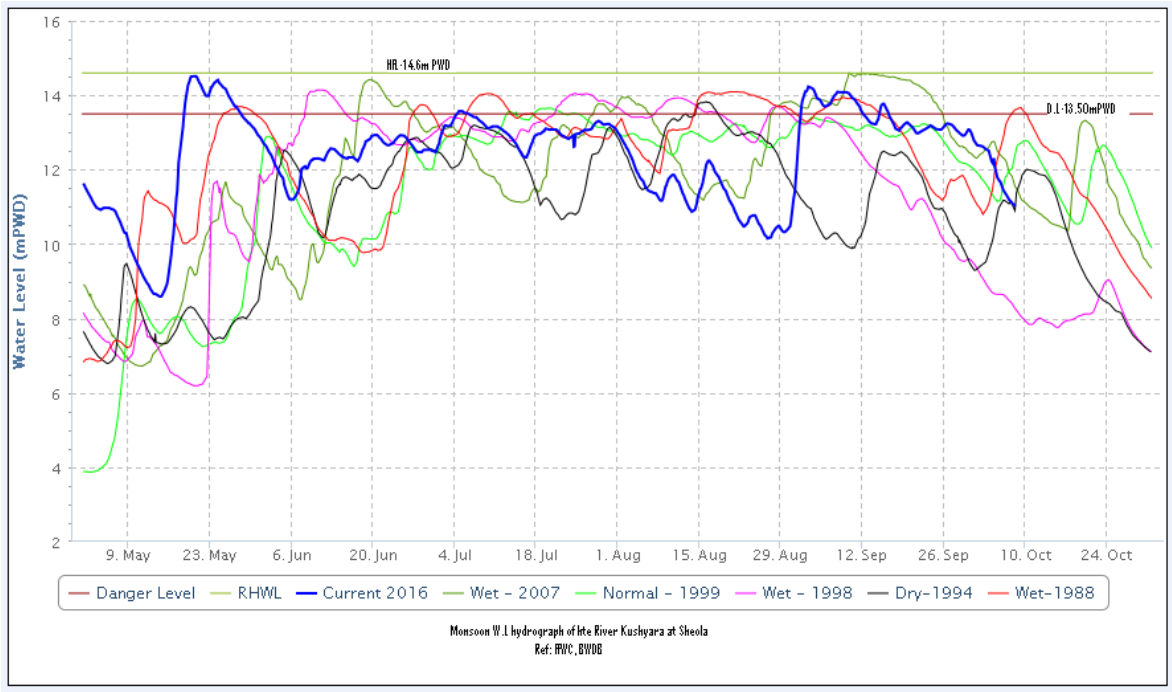
Data Type	Station Name	Station ID	Year of Availability	Source
Water Level	Sheola	SW173	1969 to 2016	BWDB
Discharge	Sheola	SW173	1950 to 2016	BWDB

Figure 3.14: Location Map of Data Collection Point at Sheola on the Kushiyara River

Source: BWDB, 2016

Analysis of Data: The collected hydrological data of Sheola on the Kushyara River has been used for the frequency analysis. The monsoon W.L hydrograph is shown in Fig 3.15

Figure 3.15: Monsoon Season Water Level Hydrograph of Kushiyara at Sheola



Source: BWDB, 2016

Frequency Analysis: Frequency analysis for extreme W.L of Sheola has been performed using HYMOS tool. Three different probability distributions (Gumbel-EV1, Log Pearson-3 and Log Normal) have been used to find the best fit one for the dataset of Kuishyara River, and finally Log Pearson-3 has been chosen. Fig. 3.16 to Fig. 3.18 present the plots of the three distributions. Table-3.3 shows the probable Water levels of the Kushyara River at Sheola Station for three distribution methods.

Figure 3.16: Gumbel Distribution of Return Period

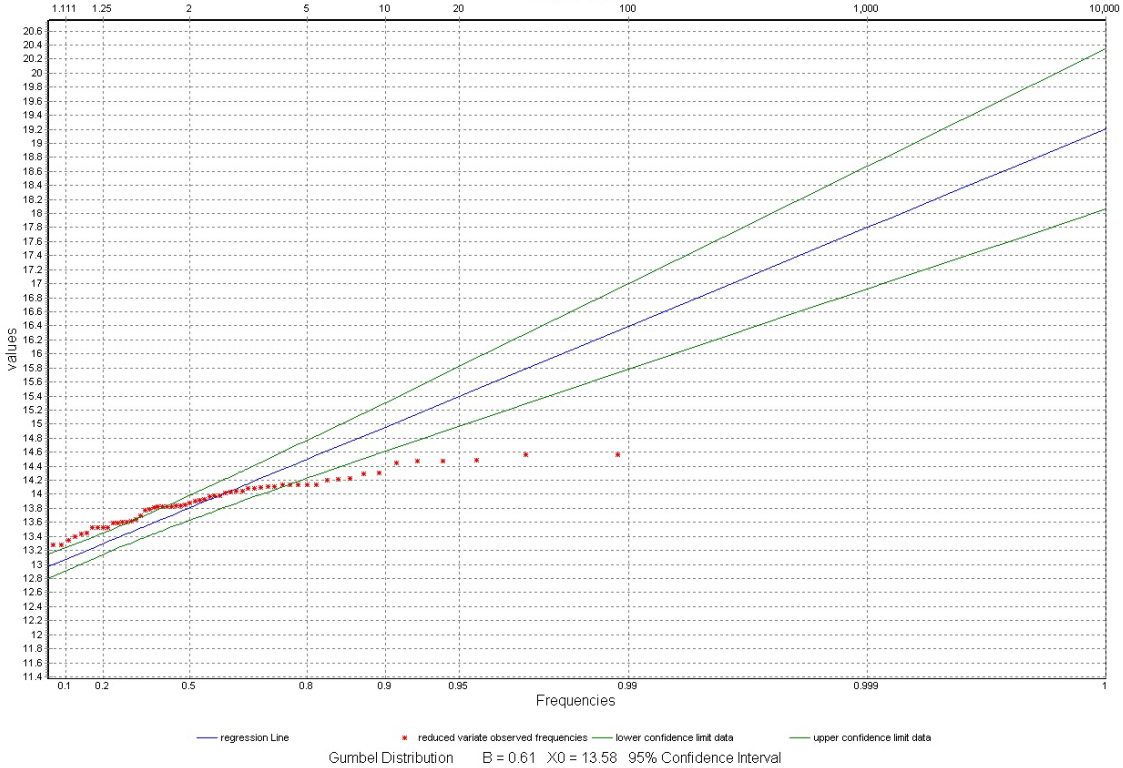


Figure 3.17: Return Period Calculation

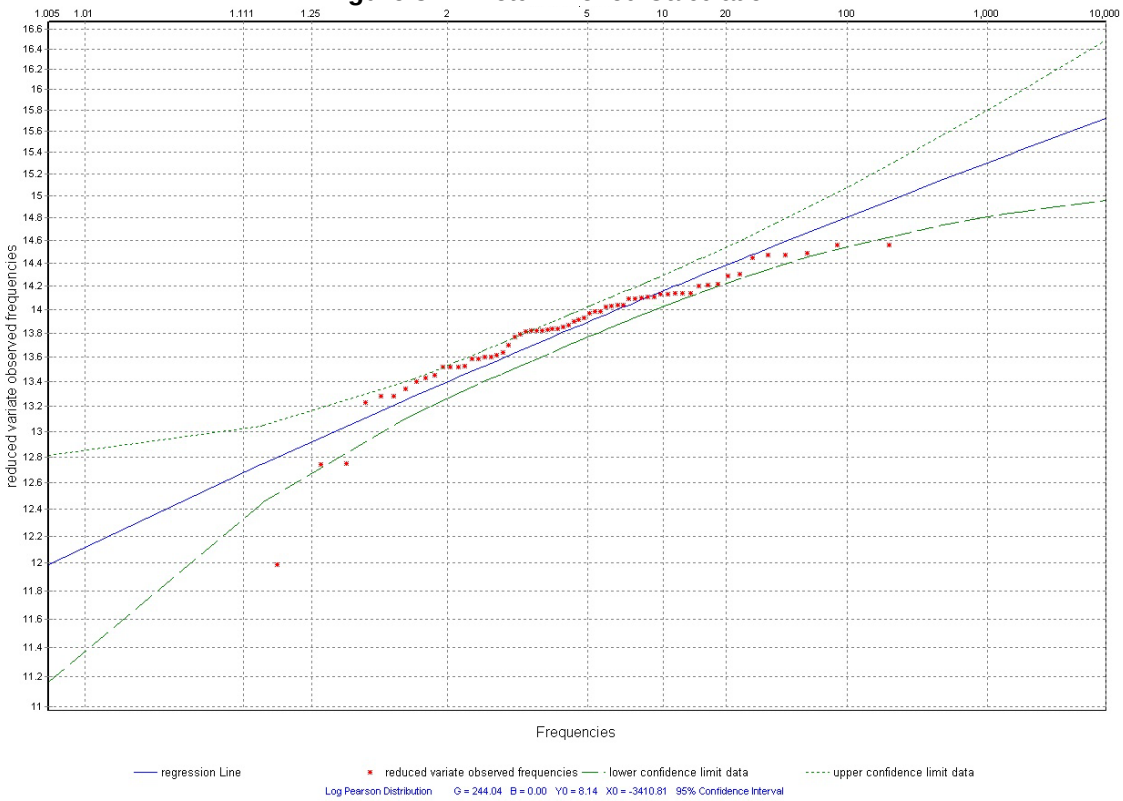


Figure 3.18: Return Period Calculation

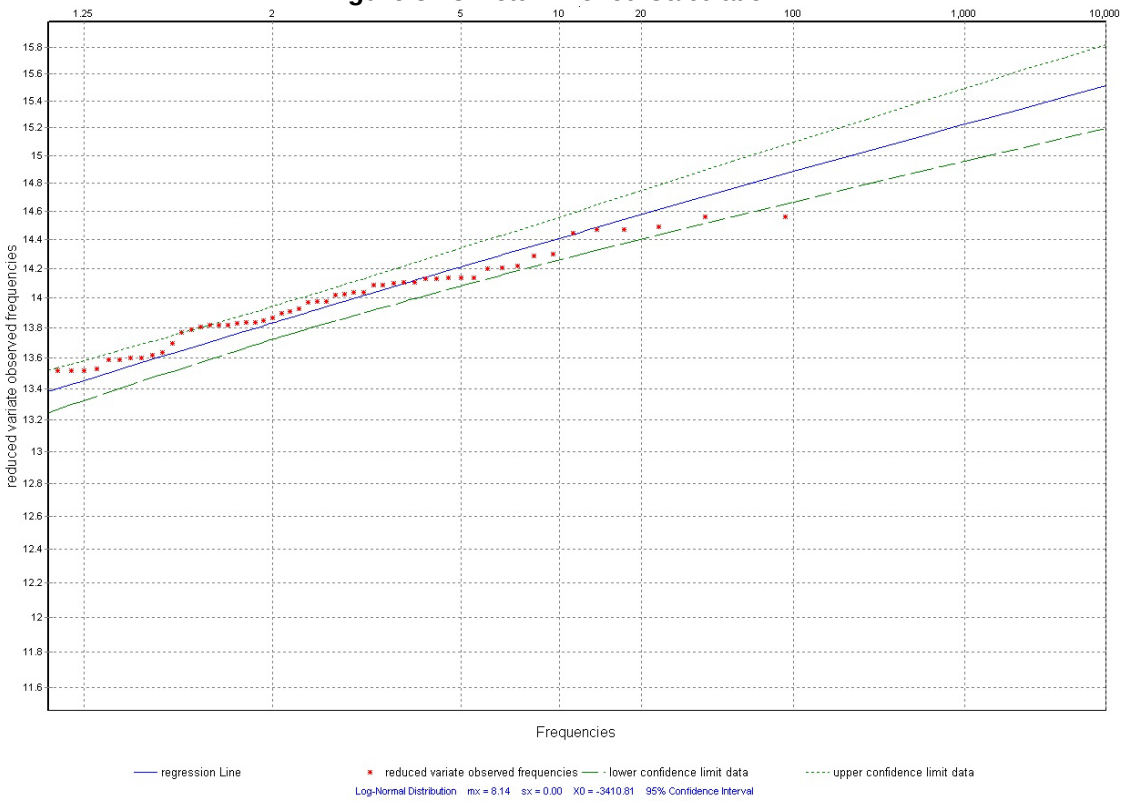


Table 3.3: Probable Water levels of the Kushiyara River at Sheola Station for three distribution methods

Probability Distribution	Return Period in year					
	2	5	10	25	50	100
Gumbel (EV1)	13.808	14.5	14.958	15.537	15.966	16.392
Log Pearson-3	13.825	14.229	14.446	14.682	14.838	14.979
Log Normal	13.835	14.214	14.412	14.624	14.761	14.884

To select the best fit among the three distributions Chi square test and Kolmogprov-Smirnov (K-S) test is done. **Table 3.4** shows the Chi-square and K-S test results.

Table 3.4: Chi square and K-S test results

Test	Gumbel Distribution	Log-Pearson Distribution	Log-Normal Distribution
K-S Test	.0292	.3011	.3972
Chi Square Test	.0000	.0337	.2190

It is evident that Gumbel (EV1) distribution does not fit in this case. From Table 3.4 it is seen that Chi Square is minimum for Log-Pearson Distribution. Again we know that if Chi Square is equal to zero the theoretical and observed frequencies agree exactly; while if Chi Square is greater than zero they do not agree exactly and the larger the value of Chi Square the greater is the discrepancy between the observed and expected frequencies.

K-S test result is minimum for Gumble distribution. From visual inspection of probability plots and the Chi Square and K-S test result, Log-Normal distribution was considered to fit the best among the three distributions.

So, considering the 100 years Return period the flood level would be 14.884mPWD. For planning and designing or establishing a project to withstand against 100 years return period the R.L for the project should be provided at 14.884 + 1 (free board) + 0.5 (for anticipating climate change effect) =16.384 mPWD eequivalent to 15.87mMSL. Now consider the final design land port R.L. at 16.35 mPWD equivalent to R.L. 15.87 mMSL

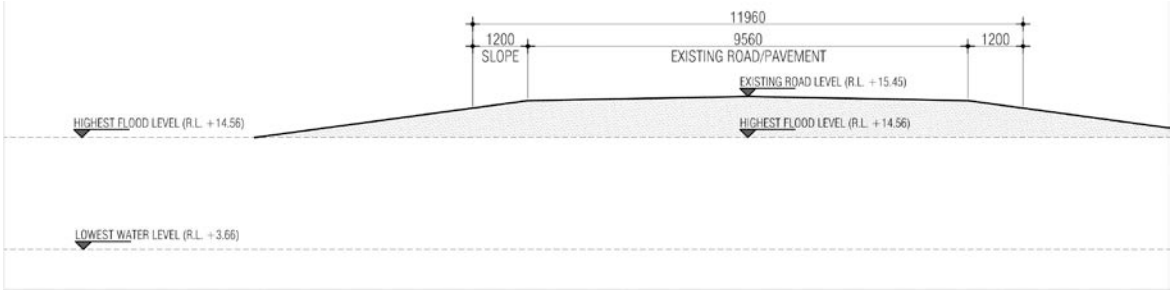
The project area falls under the flash flood area of Bangladesh. The river Kushiyara flows beside the project. This river has got the dominating influence on the flood as well as drainage on and nearby areas of the project over other small channels flowing through the project. In general if not overtopped the bank high flood bears velocity ranging from 1.25 to 2.0 m/sec. When flood water spills the bank the velocity falls as it flows all over the flood plan. As such precautionary measures to be taken for bank protection against velocity of 2 m/sec.

The difference between MSL(Mean Sea Level) of SOB(Survey of Bangladesh) and PWD(Public Work Department) is 0.46m (PWD**>**MSL). Since our field survey was conducted with bench mark reference of water development board which follows PWD, therefore, all the drawings have followed PWD.

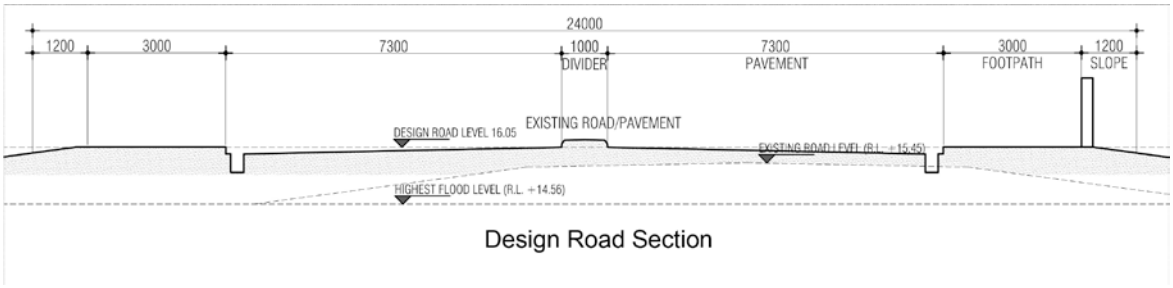
- ***Road***

The existing road is a two lane local road constructed by Roads & Highway department (RHD). This width is 12 meters and pavement is 9 meters. Existing Bituminous road is narrow and there is no other infrastructure facilities (like shoulder, median, street light etc.).The road is inadequate for long & heavy vehicles. It is suggested to improve the road with four lane carriageway with a median and design shoulder total developed road width is 24 meters. Figure 3.19 illustrates the Cross Section of the existing and proposed road.

Figure 3.19: Cross-Section of the road in Bangladesh side (existing and proposed)



Existing Road Section



Design Road Section

3.6.2. Indian Border side

The area opposite to Sheola LC, is Sutarkandi. It has better infrastructure than that of Bangladesh with good road & railway connections. Border Security Force (BSF) has a complex just at 300 meter distance from border line. BSF has around 120 man power under an Inspector with one sub Inspector. Other agencies are Customs, Immigration and C&F as like as Bangladesh.

There is a truck terminal at 2 kilometers away from Sheola Land Customs Station. This truck terminal is capable of accommodating150-170 trucks with office, accommodation, weighing bridge, well protected periphery wall, well circulated road for easy movement of trucks and different entry- exit to control the access to the terminal. Karimganj is a District town under Assam State. Sutarkandi is well connected to Karimganj by Indian National High Way and Indian Railway, and linked to border and Sheola LC. It can be well assumed that India has the mindset of constructing a Land Port of Traditional/ Co-located pattern, where we do not have other option then choosing a site at present LC/ICP location.

3.7. Existing Operational Conditions

Both India and Bangladesh follows the same operational procedure in handling traffic and goods. However, there is a subtle difference regarding the organizational setup. The organizational setup and the procedure of export and import are stated here briefly.

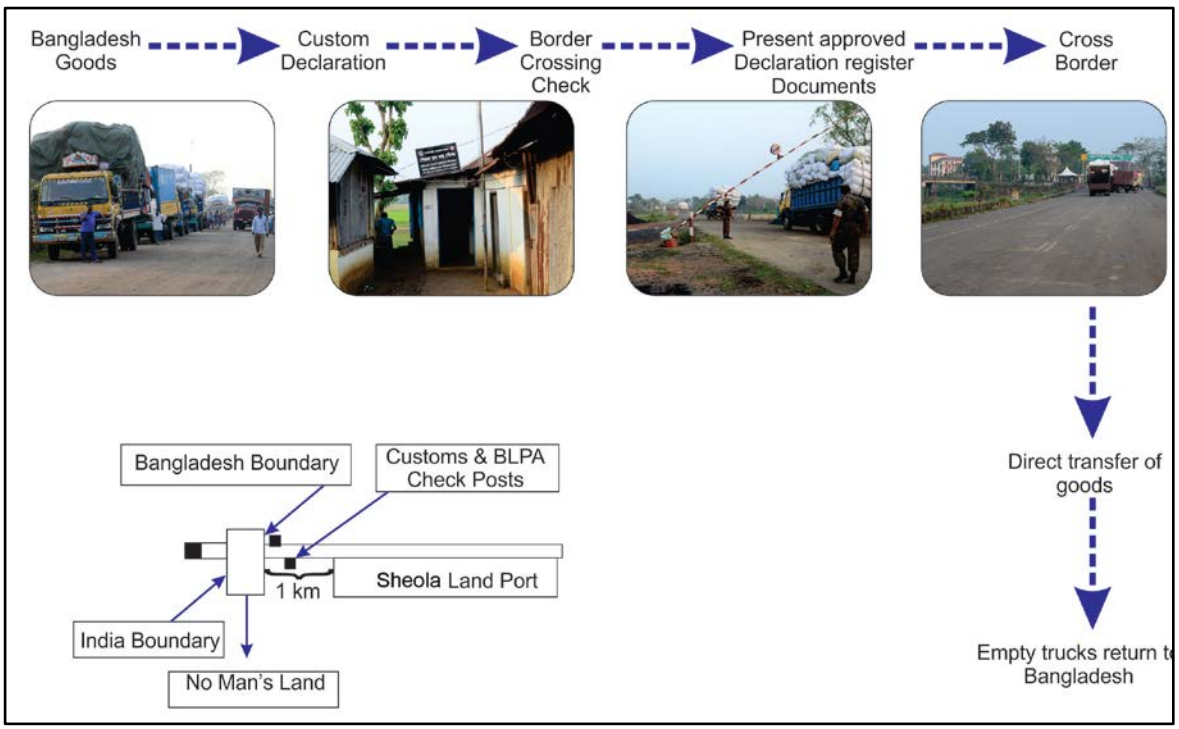
3.7.1. Export-Import Procedure in Bangladesh Border Side

Items and goods are transported by large trucks from different towns and industries to Sheola through Sylhet District Head Quarter (HQ). On arrival at Sheola, LC station Custom Declaration is done, all customs documents are checked and verified and finally recorded manually.

All export goods are not subject to duty. Export documents are collected by the same customs cargo section at the border before the goods vehicle crosses the borderline to India. Then, the truck goes to Indian truck yard. Items are off-loaded head to head basis and empty truck gets back to Bangladesh. The empty Bangladesh trucks return to Bangladesh upon completion of the transfer.

Crossing approval is made by the Border Guard of Bangladesh (BGB). BGB also checks and record the individuals going with the truck, items quantity, vehicle registration and driver's license manually. On return, the empty trucks are checked also and gets tallied with the information recorded previously.

Figure 3.20: Procedure of Export from Bangladesh



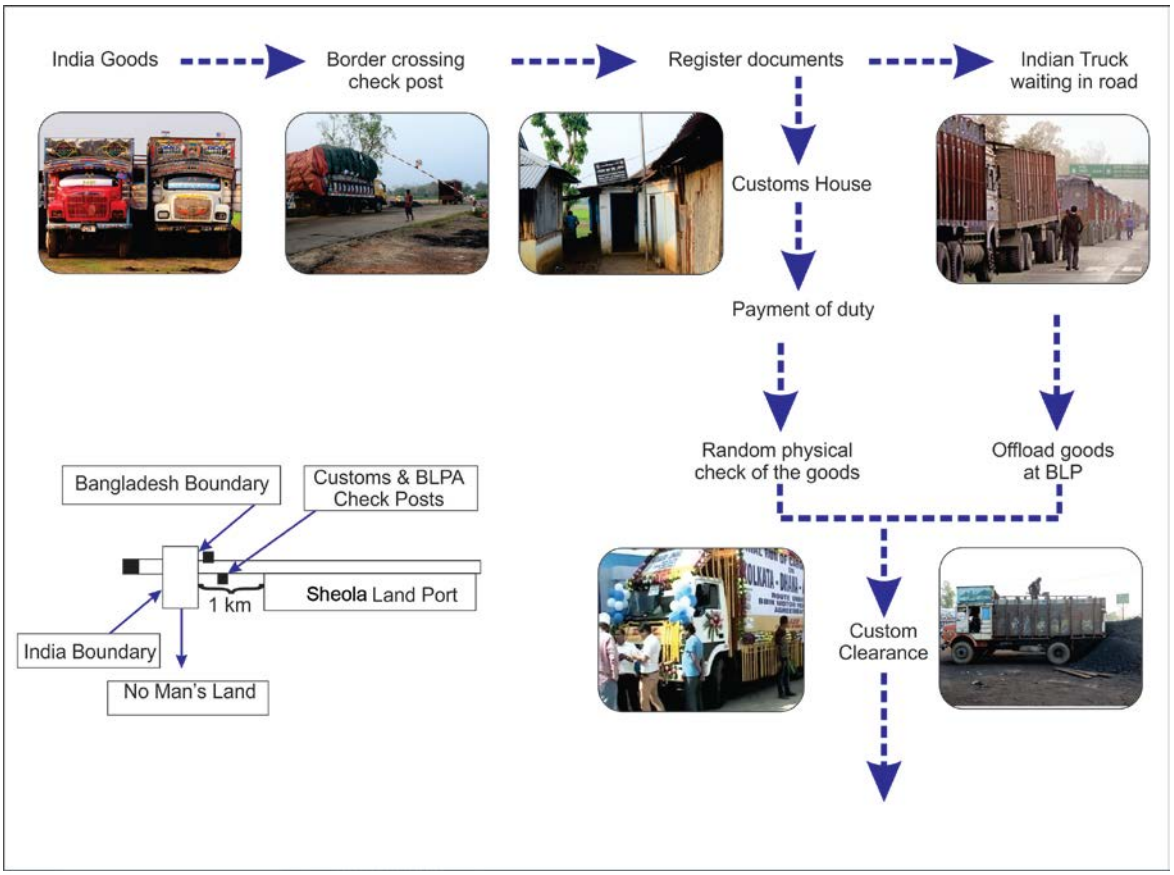
3.7.2. Export-Import Procedure in Indian Border Side

Immigration completes the formalities for individuals going to travel/tour to India. At the same time, while some person coming to Bangladesh from India, this department verifies the visa/travel permit and all other documents and validity of these documents. Finally, it gives the clearance for entry or exit.

Goods from India entering Bangladesh though Sheola LC are carried by Indian registered truck. At the entry point of border, the details of the imported goods is recorded manually in a register and given a document. The documents are subsequently forwarded to the customs office for assessment of import duties. The trucks then proceed to privately owned open yard to offload goods.

Duty payable is totally based on the cost and freight value of the goods as given in the import document (Import cargo manifest invoice, packing list, bill of landing) which are checked by customs officers from the Sheola customs office. After the assessment is done by custom the duty is paid to the customs bank account in cash. The customs office is linked with the task.

Figure 3.21: Procedure of Import from India



3.7.3. Organizations in Bangladesh Border Side

Sheola Immigration Check Post (ICP)/LC is under Beanibazar BGB Battalion, which is within Srimangol BGB Sector in the Northeastern Region of Border Guard Bangladesh. This LC is looked after by the Border Out Post (BOP) situated at Borogram with a distance of 1.5 KM having a strength of more than a platoon. There are three shift of daily duty with 4-6 manpower commanded by a Non Commissioned Officer (NCO) at the border. They are supervised by a Junior Commissioned Officer (JCO).

This small group of BGB is the final authority to allow any person or items loaded in vehicle to cross the border with all the clearances from Customs, Immigration and C&F Agents with valid documents recorded manually. On the other hand, during inward movement BGB is the first authority to give the clearance for entry.

Customs provide integrated customs services to meet development requirements and keep pace with the latest developments at all level. It requires striking a balance between facilitation of flow of trade for importers and exporters in accordance with the country's obligations on the one hand, and carrying out accurate inspection tasks of consignments, on the other hand. Ensuring prevention of entry of prohibited and infringing materials such as counterfeit items, customs is the first line of government agency for the country besides BGB.

Immigration office is to ensure that immigration legislation is enforced. This covers the rules of entry for visa applicants, foreign nationals or those seeking asylum at the border,

detecting and apprehending those that have breached the border and removing them, or pursuing those in breach of immigration and criminal laws.

C&F agent is an important stakeholder in Bangladesh border side who works at the operational level. They are engaged in uploading or downloading goods at the land port area.

Table 3.5: People using Immigration Office (Unit: persons/year)

Immigration	2015	2,020	2025	2030	2035	2040
Entry	2,160	3,323	4,883	6,849	9,384	12,557
Departure	1,680	2,401	3,446	4,834	6,623	8,863
Total	3,840	5,724	8,330	11,683	16,006	21,420

Source: Immigration Office, Sheola

Table 3.6: Working People (Staff) in Sheola Land Port (Unit: people)

Land Port	Organization	2016	2030**	2040
Sheola	Customs	9	18	27
	Immigration	7	7	8
	Quarantine	0	7	8
	BLPA	0	50	75
	BGB*	33	60	90
	C&F	1025	940	400
	Total	1074	1072	618

* Numbers of BGB officers may be in secret.
** For the people requested in 2030, the space requirement is considered for 2025.

3.7.4. Organizations in Indian Border Side

Indian border side is operationally better than Bangladesh border side as there is a full fledge land port installed there. The organizations involved in operation are Border Security Force, Customs, Immigration and C&F as like as Bangladesh but the information and operational procedure are scanty.

3.8. Export and Import through Sheola Land Port

3.8.1. Export and Import Trends

At Sheola land port, there is no quarantine function among CIQ (Customs, Immigration and Quarantine) functions which international gateways have got in general. Goods imported through Sheola land port was 99,325 ton (270~280 ton/day) and worth of USD 1,655 thousand in the year of 2014/15. Among imported items, coal is dominant and it shared is 97.1% in ton, 75.6% in monetary value. The quarantine function was not given emphasize to install here as the prime imported item is coal.

The second largest good in share is orange and its shares 1.2% (in ton) and 19.9% in monetary value. Volume of goods exported through Sheola land port was 34,837 ton (95~100 ton/day) and worth of USD 11,155 thousand in the year of 2014/15. Exported goods are composed of various items.

Table 3.7: Major Import Items in Sheola Land Port (2014/15)

No.	Description	Quantity (Ton)	% (Ton based)	USD ($)	% (USD based)	USD ($)/Ton
1	Coal	96,458	97.11	1,251,332	75.63	13.0
2	Mango	3	0.00	994	0.06	331.4
3	Augor Deck	4	0.00	0	0.00	-
4	Tomato	8	0.01	1,606	0.10	200.8
5	Scarp	30	0.03	571	0.03	19.0
6	Orange	1,164	1.17	328,533	19.86	282.4
7	Citrus	14	0.01	3,954	0.24	282.2
8	Zinger	1,615	1.63	57,262	3.46	35.5
9	Apple	26	0.03	9,478	0.57	363.0
10	Pan	2	0.00	597	0.04	363.7
11	Banana	2	0.00	200	0.01	97.7
Total		99,325	100.00	1,654,528	100.00	-

Source: Internal data of the local office of Customs

The first and the second largest goods of export in share are cement and food. The shares of cement and food are 51.7% and 3.15% respectively in ton, 11.9% and 57.7% respectively in monetary value. In view of the volume in weight, import quantity (99,325 ton) is much higher (2.9 times) than export quantity (34,837 ton) in 2014/15. In monetary unit, export quantity (USD 11,155 thousand) is 6.74 times than import quantity (USD 1,655 thousand) in 2014/15.

Sheola land port could be classified as an export land port where export portion is larger than that of import.

Table 3.8: Major Export Items in Sheola Land Port (2014/15)

No.	Items	Quantity (Ton)	% (Ton based)	USD	% (USD based)	USD/Ton
1	Food (Pran, Bangle)	10,979	31.51	6,432,504	57.66	586
2	Cement	18,025	51.74	1,324,680	11.87	73
3	Caustic Soda	1,730	4.97	882,500	7.91	510
4	Waste Cotton	851	2.44	213,750	1.92	251
5	Liquid Chlorine Gas	1,604	4.60	409,003	3.67	255
6	Phatic Acid	467	1.34	158,653	1.42	340
7	Brick Machine	6	0.02	10,300	0.09	1,717
8	Plastic Materials	638	1.83	961,789	8.62	1,508
9	Ready-Made Wear	60	0.17	107,258	0.96	1,782
10	Net	8	0.02	7,254	0.07	907
11	Fish	172	0.49	349,375	3.13	2,034
12	Tissue Paper	32	0.09	40,283	0.36	1,245
13	Soap	58	0.17	70,735	0.63	1,215
14	Tube Well	54	0.16	23,475	0.21	431
15	Water Tank	1	0.00	495	0.00	742
16	Melamine	27	0.08	50,313	0.45	1,858
17	Ceramic	21	0.06	25,569	0.23	1,246
18	Otobi Furniture	6	0.02	17,046	0.15	2,702

No.	Items	Quantity (Ton)	% (Ton based)	USD	% (USD based)	USD/Ton
19	Hydrogen Per Oxide	45	0.13	15,000	0.13	333
20	Citagur	14	0.04	12,880	0.12	920
21	Garment Materials	5	0.02	9,044	0.08	1,715
22	Business Materials	1	0.00	2,032	0.02	3,001
23	Football	0	0.00	545	0.00	3,062
24	C.I Sheet	34	0.10	30,742	0.28	916
Total		34,837	100.00	11,155,225	100.00	

Source: Internal data of the local office of Customs

According to a field interview with immigration officer, number of people coming in and going out from Bangladesh through Sheola land port turn out to be 3,048 persons in 2015, which are composed of 1,368 persons for entry and 1,680 persons for departure. The following tables are showing the composition of export and import through this land port.

Table 3.9: Trend of Export and Import in Sheola Land Port (unit: Tons, %)

Year	2011/12	2012/13	2013/14	2014/15	Growth rate
Import	72407	80450	89392	99324	9.29
Export	28188	31320	34800	32000	3.38
Total	100595	111770	124192	131324	7.64

Source: Internal data of the local office of Customs

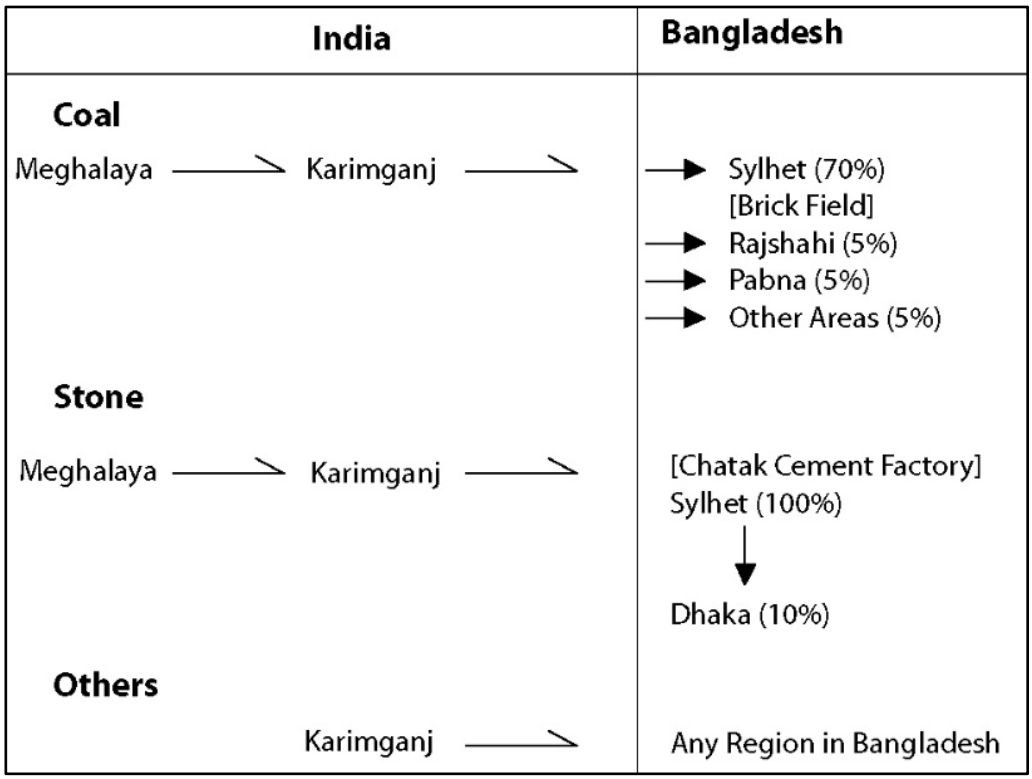
The export-import data suggests that, the increase in import is larger than the rate of increase in export. Bangladesh already has a trade balance with India. Because of having no land port and facilities at Bangladesh side, the possibilities and potentialities of expanding export are not yet worked out. Nevertheless, with the help of poor infrastructure, the growth rate of this land port's trade showed a steady annual average of more than seven percent per year.

3.8.2. Origin-Destination of Export-Import Commodities

Results of an Origin-Destination Survey (implemented in April 2016) for export/import commodities passing through Sheola Land Port can be summarized that:

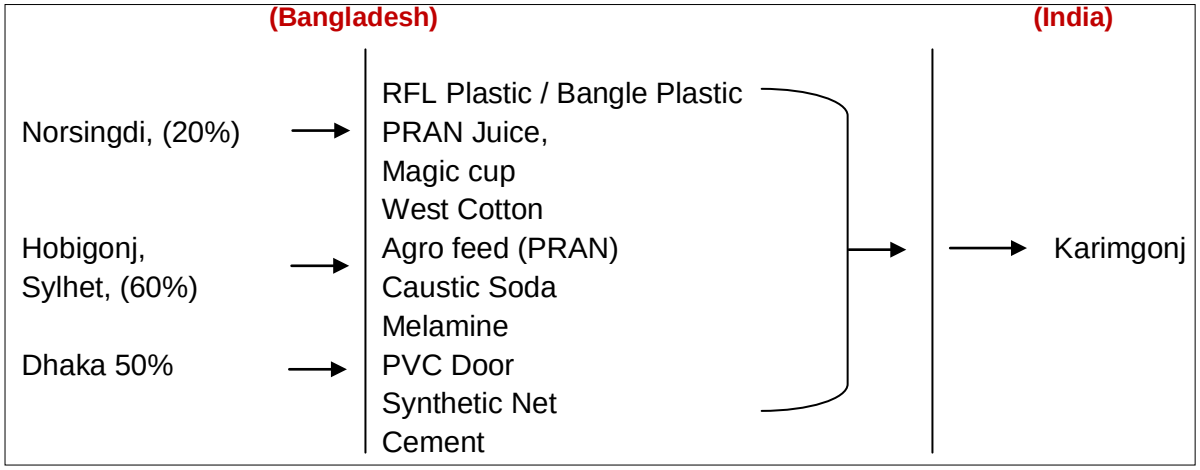
- Major export/import activities are made along the East-West corridor passing through Sylhet in Bangladesh and Karimgonj in India even though the activity ranges are over the whole country in Bangladesh;
- Especially the main import commodity, coal, is coming from coal mines in Meghalaya in India. Destinations of imported coal are scattered to brick fields in Sylhet and other regions as because coal is used as a raw material of brick.
- Export commodities which are of different types mainly coming from Dhaka, even though half of them are coming from various regions in Bangladesh.

Figure 3.22: Import through Sheola Land Port



Source: Field Survey, 2016

Figure 3.23: Export through Sheola Land Port from passing vehicle O/D Survey



Source: Field Survey, 2016

3.9. Summary and Implications

The most emerging issue for Sheola Land Port now is to set up a modern land port with advanced technologies that will improve trade and business which will enhance the cross border economy.

Chapter 4: Traffic Impact Assessment

4.1 Introduction

4.2 Forecast for Export and Import Quantities

4.3 Forecast for Numbers of Entry and Departure People

4.4 Forecast for Traffic Volumes on the Access road

4.5 Summary and Implications

4.1. Introduction

In general, traditional 4 steps' models are deployed for traffic demand forecast. However, models for transport demand forecast are selected in consideration of objectives of the project and uses of forecast results.

In this project, traffic volumes estimated through traffic demand forecast will be utilized as base data for calculating the sizes of land development and facilities of the land port, for evaluating the access road in view of road improvement with necessary lanes and proper pavement, and analyzing economic and financial feasibility of the project.

Objectives of transport demand forecast in the project could be identified as setting up:

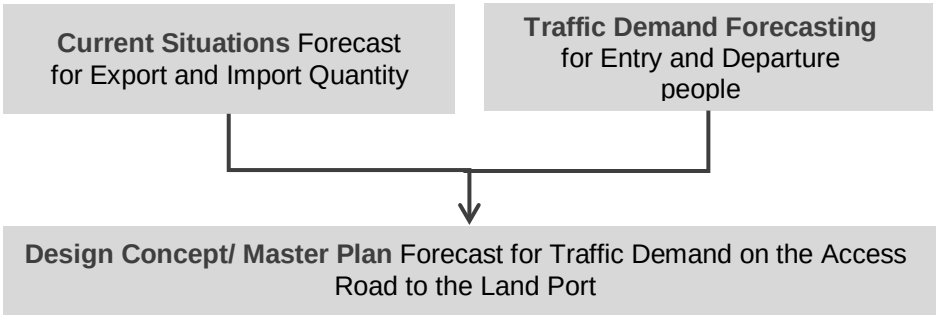
- land port development size and methods (expansion and/or improvement of land port);
- land use plan in the land port, CIQ and support facility plan and design for the future.

Linked objectives of transport demand forecast could also be identified as:

- estimating capacities of each facilities which could be adopted in the future conditions;
- establishing phased development plan for getting cost effectiveness;
- securing flexibility in land use under uncertain trade circumstances, and;
- assessing the traffic capacity of the access road.

Therefore, Works for traffic demand forecast can be divided into three parts: forecast for export and import quantity of goods, forecast for entry and departure people (immigration), and forecast for traffic demand on the access road to Sheola land port.

Figure 4.1: Work Flow for Traffic Demand Forecast



Source: Developed by the Consultant

Based on the project completion year of 2020, the traffic demand forecast will be carried out with the short-term target year of 2020, the mid-term target of 2030, and the long-term target of 2040.

Table 4.1: Target Years of Transport Demand Forecast

Classification	Year
Base year	2016
Opening year	2020
Interim-Target year	2030
Final-Target year	2040

4.2. Forecast for Export and Import Quantities

4.2.1. Assumptions for Export/Import Forecast

There are various stakeholders who will be impacted by the volumes of export and import as well as national and international economic situations in the future. Some assumptions are, therefore, deployed for forecasting future trade volumes, which are:

- Current trends of export/import on the corridors through Sheola land port between Bangladesh and India will be continued as a whole even though there will be some uncertainties in the trade markets, and;
- Main commodities of trades through Sheola land port could be changed as the industrial structures of the two countries on the corridor will be upgraded, which will be depending on industrial strategies of each country and on impacted market changes.

The governments of Bangladesh and India have been trying to and are going to upgrade their industrial structures for achieving economic development of the countries. Trade markets are getting more open to all over the world and are impacted by the other economic activities to pursue more efficiency and more competitiveness. Under this circumstances, it should be understood that:

- The forecast results will represent only total trade volumes (not each volume of commodities);
- The portions of each commodity among the total trade volumes could be changed (not to be fixed), and;
- It is therefore recommended that the development of Sheola land port should be made in two phases to get flexibilities for being adapted to uncertain future conditions, and;
- In the first phase (for earlier 10 tears), requested land acquisition with the long term (20 years) view is very much important at the same time that permanent structures are supplied with consideration of securing flexibility.

4.2.2. Forecast for Export/Import Quantities

Based on current export/import trend between Bangladesh and India, scenarios on the trade volume growth in the future at Sheola land port were set up with different increase rates under some assumption that:

- Scenario 1 ~ a) Current trend will continue to 2020; b) Growth rates will be decreased after 2020; c) Import growth rates will be reduced a bit faster than those of export growth rates to balance between import and export,
- Scenario 2 ~ Special commodities such as coal in import and cement in export have turned out to be big portions of import and export respectively and are expected to be reduced more quickly than other commodities. The growth rates of the special commodities are dealt with higher reduction speed than those of other commodities. At the same time, export growth rates in the future will be the same with import growth rates even though export growth rates are currently higher than import growth rates.

The growth rates shown in the scenarios seem to be rather higher when those are compared to the economic growth rates of the two countries. An implicated idea on these is that the trade volumes at Sheola land port have been constrained by poor trade environment at Sheola land port. Trade volumes at Sheola land port will be rapidly increased for the time being if the land port will be development.

In consideration of industrial development policies of the government of Bangladesh, assumptions in 'Scenario 2' is selected as the more probable option.

Table 4.2: Scenarios of Export/Import Growth (unit: %)

Items			~ 2020	~ 2025	~ 2030	~ 2035	~ 2040
Scenario 1	Import		14.87	13.0	11.0	8.0	6.0
	Export		11.41	12.0	11.0	10.0	9.0
Scenario 2	Import	Coal	14.87	14.0	12.0	9.0	7.0
		Others		20.0	15.0	12.0	10.0
	Export	Cement	11.41	12.0	11.0	8.0	7.0
		Others		20.0	15.0	12.0	10.0

Source: Calculated by the Consultant

Based on the growth scenario in the future, forecast results of export/import quantities are shown by scenario in Table 4.2. Total trade amount in 2040 is expected to be in the range of 1.9 ~ 2.4 million tons a year, which is similar to current Bhomra land port in trade volumes.

The future trade volumes at Sheola land port will be 1.0 million tons in 2030 and 2.4 million tons in 2040. The import quantities are 784,921 tons (74.9%) in 2030 and 1,716,284 tons (72.2%), which will be much larger than the export quantities, respectively.

Table 4.3: Forecast Results of Export/Import Quantities (unit: ton)

Items		2020	2025	2030	2035	2040
Scenario 1	Import	228,244	420,525	708,609	1,041,180	1,393,333
	Export	66,618	117,404	197,833	318,612	490,225
	Total	294,863	537,930	906,443	1,359,792	1,883,558
Scenario 2	Import	228,191	443,069	784,921	1,215,073	1,716,284
	Export	66,617	140,741	263,260	433,962	667,624
	Total	294,808	583,811	1,048,181	1,649,035	2,383,908

Source: Calculated by the Consultant

However, the export volumes are much bigger than import volumes in Sheola land port when the trade volumes are calculated in monetary unit. The total trade volumes will be increased from USD 16.0 million in 2016 to USD 316.7 million in 2040, which will be 16.8 times' growth.

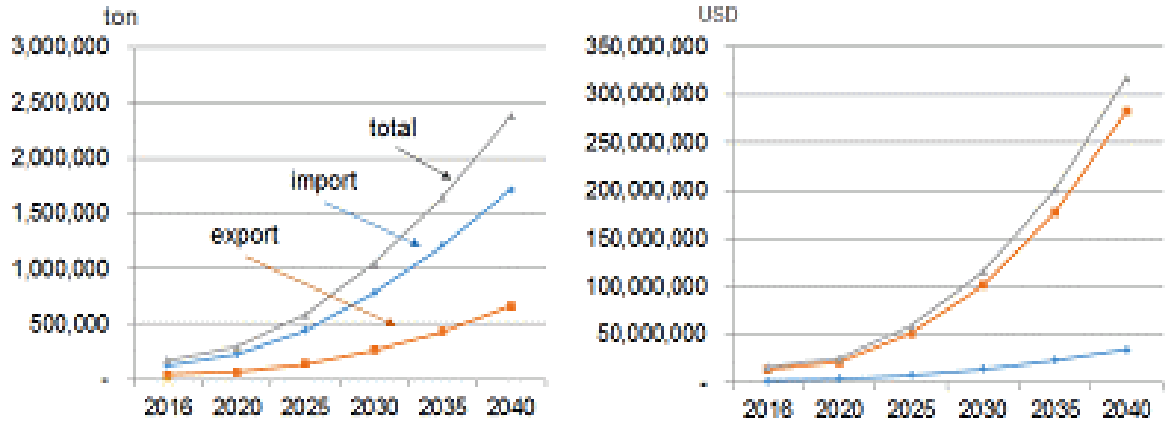
Table 4.4: Forecast Results of Export/Import Quantities (unit: USD thousand)

Items	2016	2020	2025	2030	2035	2040
Import	2,183	3,801	7,840	14,391	23,179	34,209
Export	13,846	21,332	51,241	101,607	176,862	282,539
Total	16,029	25,133	59,081	115,998	200,141	316,748

Source: Calculated by the Consultant

Therefore, Sheola land port could be classified as an export-led land port. This sort of characteristics is likely to be occurred in the land ports where there are bigger cities having good access roads in Bangladesh side than those in Indian side. The graphical views of the trends are shown in the following figure (figure 4.2).

Figure 4.2: Work Flow for Traffic Demand Forecast



Source: Calculated by Consultant

When a plan and a design of Sheola land port are established, the assumptions in the forecast process are considered and some planning principles can be set up as follows:

- to acquire requested land size which will be necessary for the year 2040 in the long-term view (If time goes by without securing proper land size, land port development would be much more difficult and the results of it would be far from trade facilitation targets, and then;
- to develop the land in phased manner with targeting the year 2030 & 2040 for getting flexibility in planning and design, which will give land port facilities rooms to accommodate uncertain future circumstances: changed shares of export & import commodities and upgraded CIQ procedures.

4.3. Forecast for Numbers of Entry and Departure People

4.3.1. Assumptions for Entry / Departure People

Numbers of people who across the border between Bangladesh and India have been found to be related to the growth of population and economic activities of the two countries. Therefore, some assumptions are deployed for forecasting future numbers of entry and departure people at Sheola land port, which are:

- The number of entry people is closely related to population and/or economic activities of Bangladesh, and;
- The number of departure people is closely related to population and/or economic activities of India.

There will be many people who across the border as tourists in the future. However, this new aspects are highly dependent to economic activities and levels of living standards together with border operation agreements between Bangladesh and India. Even though this new aspects are not likely to be in the near future, it is recommended to be taken into account when related facilities at the land port are planned and designed.

4.3.2. Forecast for Numbers of Entry/Departure People

Based on the economic growth and population growth, scenarios on growth rates in the future were set up with different increase rates, which are shown in Table 4.4.

Table 4.5: Scenarios of Entry/Departure Growth (unit: %)

items		2016~20	2021~25	2026~30	2031~35	2036~40
Scenario 1	Entry	5.4	4.6	4.1	3.7	3.4
	Departure	4.6	4.4	4.1	3.7	3.4
Scenario 2	Entry	9.0	8.0	7.0	6.5	6.0
	Departure	7.4	7.5	7.0	6.5	6.0
Population Growth Rate		1.8	1.3	1.1	1.0	0.8

Note: 1) 'Entry' is related to economic growth rates of India while 'Departure' is of Bangladesh.
2) Here, 5.4 (2016~20) = (1.8 + 9.0)/2 = 5.4

Based on the two growth scenario in the future, forecast results of entry/departure people are shown by scenario in Table 4.4. Total number of people who come in and go out from Bangladesh will increase from 3,840 persons in 2016 to 21,420 persons in 2040

The volumes of entry/departure would be appropriate when the populations of the regions access to Sheola land port. However, the volumes of tourists across the border will be uncertain and this aspect is dealt flexibly in the planning procedures.

Table 4.6: Forecast Results of Entry / Departure People (unit: persons)

items		2016	2020	2025	2030	2035	2040
Scenario 1	Entry	2,160	2,809	3,524	4,301	5,168	6,114
	Departure	1,680	2,103	2,607	3,182	3,823	4,523
	Total	3,840	4,912	6,131	7,483	8,991	10,637
Scenario 2	Entry	2,160	3,323	4,883	6,849	9,384	12,557
	Departure	1,680	2,401	3,446	4,834	6,623	8,863
	Total	3,840	5,734	8,330	11,683	16,006	21,420

Source: Calculated by Consultant

4.4. Forecast for Traffic Volumes on the Access road

4.4.1. Current Situation of the Access Road

If Sheola land port will be developed as planned, how much traffic will be increased on the access road? Numbers of trucks to carry out export/import goods at Sheola land port are expected to increase 72 vehicles/hour in 2040 and numbers of people who enter/depart Bangladesh from 48 persons/hour in 2040. These volumes will be around 10% of the road traffic capacity of one lane in one direction.

Therefore, the access road analysis in this project is limited to the road section directed linked to the land port. The traffic volume survey was made at two sites on the access road in April 2016.

Table 4.7: Survey Site of Traffic Volume

Survey	Location	Duration	Method
No. 1	Dubag point near Sheola bridge	peak-time (1hours)	people counting
No. 2	Sutarkandi Bridge Point	peak-time (1hours)	people counting

Peak hour traffic volumes on the access road which has one lane for both directions (Even though the road is used as two lanes for both directions because the paved road width is 7.5m.) are 457 vehicle/hour at survey point No.1 and 126 vehicles/hour at the point No.2. This shows that there is no traffic congestion on the access road.

Figure 4.3: Traffic Volume Survey Points

Source: Google Earth Image

Table 4.8: Survey Result of Traffic Volume at Peak-Time by Car Type(unit: vehicle/hour)

Survey Point	Truck	Tractor	Bus	Car / Microbus	CNG	Rickshaw	Motor Cycle	Total (two-way)
No. 1	31	8	0	31	124	186	77	457
No. 2	24	6	0	6	48	24	18	126

Sources: Field (Local) survey data

4.4.2. Assumptions for Traffic Volume Forecast on the Access Road

Traffic volumes on the access road to Sheola land port will be mainly affected by the volumes of export/import goods and the number of entry/departure people. Traffic volumes caused by residents who live and/or visit the area nearby Sheola land port may not be increase much because of the land acquisition for developing Sheola land port. Therefore, additional traffic volume forecast on the access road is focused on the impact of Sheola land port development.

Assumptions are deployed for forecasting future traffic volumes caused by export/import goods and entry/departure people at Sheola land port, which are:

- Current characteristics for carrying out goods will not be changed very much in the future. It means that present goods volumes per truck will be deployed to calculate truck numbers to carry out export/import commodities in the future. In fact, the

changes are expected by containerization and information technology application as well as improved customs procedures. However, the total traffic impacts on the access road may not be big different if the traffic volumes are converted to passenger car unit (PUU) to analyze the impacts on the road capacity.

- Current characteristics of transport mode shares of people will be changed very much in the future. Therefore, Analyses will be focused on traffic volume impacts on the access road and parking spaces at Sheola land port, which will be caused by people using immigration office and people who will work in the land port.
- Current border management patterns in which all the trucks carrying out export goods cannot go over the Indian land port and all import trucks cannot come over the Bangladesh land port will not be changed by the target years.

4.4.3. Forecast Results for Traffic Volumes on the Access Road

Traffic volumes generated by land port will be 287 trucks/day in 2030 and 653 trucks/day in 2040 for both directions on the access road. If calculated in hourly traffic volume, the generated traffic will be 34 trucks/hour in 2030 and 78 trucks/hour in 2040.

Table 4.9: Forecast Results for Traffic Volumes on the Access Road(unit: vehicle/hour)

Items		Unit	2016	2020	2025	2030	2035	2040
Export		1,000 ton	43	67	141	263	434	668
Import		1,000 ton	131	228	443	785	1,215	1,716
Total		1,000 ton	174	295	584	1,048	1,649	2,384
Truck numbers on the **access road** (used for planning: access road)	Export	Trucks/year	4,324	6,662	14,074	26,326	43,396	66,672
	Import	Trucks/year	13,106	22,819	44,307	78,492	121,507	171,628
	Total	Trucks/year	17,430	29,481	58,381	104,818	164,904	238,319
	Export	Trucks/day	12	18	39	72	119	183
	Import	Trucks/day	36	63	121	215	333	470
	Total	Trucks/day	48	81	160	287	452	653
	Total	Trucks/hour	6	10	19	34	54	78

Note: Deployed calculation values for analyzing traffic impacts on the access road are:
- Trucks for carrying our export/import goods = 10 ton/vehicle
- Hourly traffic volumes ~ 12% of daily traffic volumes Source: survey data& Calculation

If all the trucks utilized for delivering export goods are coming back without carrying out anything from the land port and all the empty trucks are coming to the land port to carry out import goods, traffic volumes on the access road will be double of the numbers above. For example, the truck volume for both directions on the access road will be 68 trucks/hour in 2030. If a half of the truck coming in to and going out from the land port will be empty, the truck volume on the access road 51 trucks/hour (68 - 34/2 = 51).

This generated traffic volume, 51 trucks/hour (around 75 pcu/hour), will not impact so much when compared to the road capacity[2]. The road capacity point of view, there will

[2]Traffic capacity of two lanes for both directions is around 3,000 PCU/hour. Here, PCU stands for passenger car unit.

not be traffic congestion on the access road if the road will be improved to two lane (for both directions) road.

On the other hand, traffic volumes within the land port will be 180 trucks/day in 2030 and 418 trucks/day in 2040 for both directions at the gates. If calculated in hourly traffic volume, the traffic volumes will be 32trucks/hour in 2030 and 75 trucks/hour in 2040.

These traffic volumes in the land port are closely related to capacities of each land port facilities, especially the gates and parking spaces.

Table 4.10: Forecast Results for Traffic Volumes within Sheola Land Port

items		unit	2016	2020	2025	2030	2035	2040
Export		1,000 ton	43	67	141	263	434	668
Import		1,000 ton	131	228	443	785	1,215	1,716
Total		1,000 ton	174	295	584	1,048	1,649	2,384
Truck numbers in Sheola land port (used for planning & Design: **land port**)	Export	Trucks/year	4,324	6,662	14,074	26,326	43,396	66,762
	Import	Trucks/year	6,553	11,410	22,153	39,246	60,754	85,814
	Total	Trucks/year	10,877	18,071	36,228	65,572	104,150	152,577
	Export	Trucks/day	12	18	39	72	119	183
	Import	Trucks/day	18	31	61	108	166	235
	Total	Trucks/day	30	50	99	180	285	418
	Export	Trucks/hour	2	3	7	13	21	33
	Import	Trucks/hour	3	6	11	19	30	42
	Total	Trucks/hour	5	9	18	32	51	75

Note: Deployed calculation values for planning & design of land port facilities are:
- Trucks for export = 10 ton/vehicle, Trucks for import = 20 ton/vehicle
- Hourly traffic volume ~ 18% of daily traffic volume in consideration of port operation hours

4.5. Summary and Implications

According to improvement of economic situation of both countries, the vehicle types and portions of each vehicle type among all the vehicles could be changed. However, traffic volumes on the road seems to be similar to the forecasted traffic volumes in view of the traffic capacity of the road.

Chapter 5: Preliminary Design

5.1. Introduction
5.2. Design Concept and Master Plan
5.3. Planning Concept
5.4. Master Plan
5.5. Structural Design
5.6. Electrical Design
5.7. Implementation Schedule
5.8. Cost Estimation

5.1. Introduction

The consultants worked with three alternative designs from where most suitable, feasible and as well as sustainable one has been selected. The option has been selected that is found to be economically viable and environment friendly. The particulars of the plan has been detailed out in the following sections.

5.2. Design Concept and Master Plan

5.2.1. Border Layout

There are a variety of Border Layouts working in different settings. For Bangladesh and India, analyzing all the options, Traditional design has been selected as it will give the benefits at a maximum extent. The pros and cons of options that are analyzed, are given here, for an instance.

- **Juxtaposed / Co-located**

Ideally, joint controls are conducted in juxtaposed Customs offices where physical and technical infrastructures are shared. It refer to the concept of two neighboring Customs administrations entering into an agreement to operate Customs control jointly, i.e. to coordinate export and import controls, opening hours and competences.

Figure 5.1: Conceptual image of Juxtaposed Border Layout

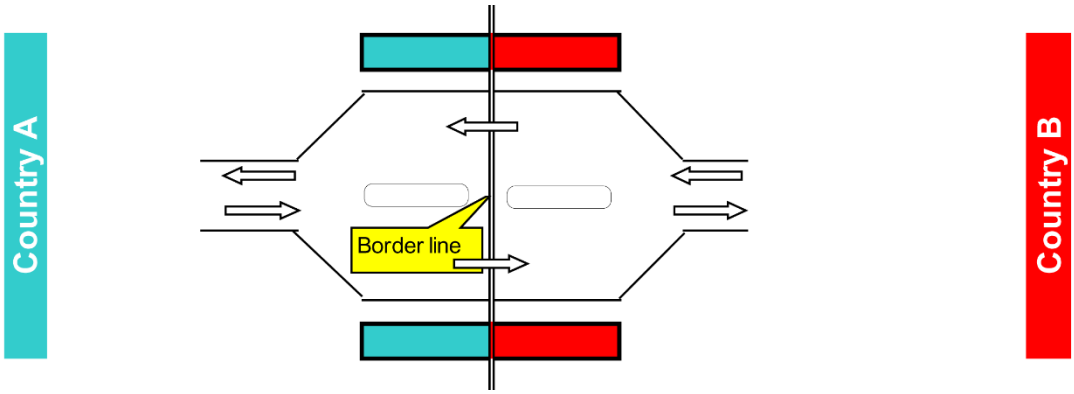


Figure 5.2: Juxtraposed border of Germany and Poland (prior to Poland's accession to EU)

Source: http: //tfig.unece.org/contents/joint-border-controls.htm

The principle of shared facilities (juxtaposed) is that all the border checks of both countries take place in the same location. The issues related to co-location setup are:

- The legal aspects of co-located require Customs officials from both countries to execute the control process for import and export goods at the same time (or nearly simultaneously) within a common area that is often cited as the key constraint by Customs administrations.
- The implementation of joint Customs controls within a common LCS will require decisions by the Customs administrations of both countries with regard to the management and operation of facilities. There are operational choices to be made with respect to a shared versus separate facility or a combination of both (comprising separate offices with shared inspection bays).

There are many models and examples of such facilities, which appeared in the pre-World War II period. But because of the following reasons, such type of border layout has not been proposed here.

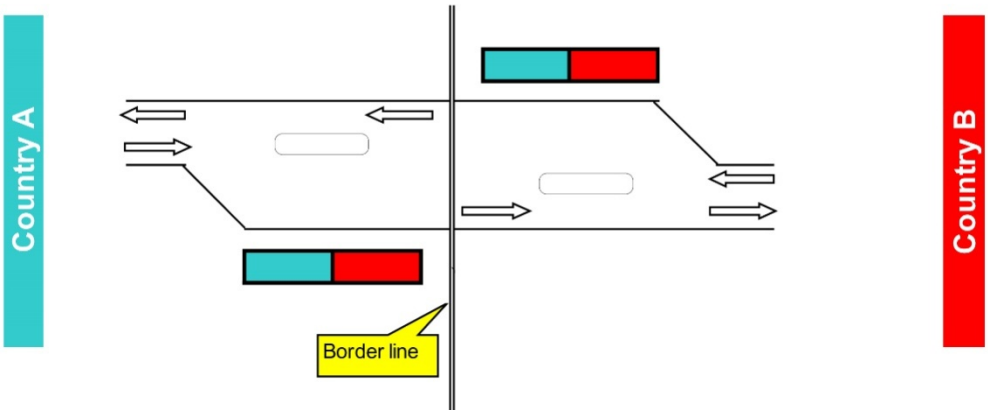
- In India, a truck terminal has been constructed already at a distance of 850 meters from the LC station of Bangladesh
- BSF Camp is at a distance of 350 meters from the part.
- The Reduced Level (RL) of Land in Indian part is less, that will increase the cost of any kind of construction including land filling, pre-cast piling etc.
- Coordinated effort for transshipment will be ineffective in this pattern due to difference in language, religion and social diversity.
- Infrastructure within no man's land is highly restricted by both of the neighboring government.

- **Staggered**

Staggered Border Layout too, works in different settings but the reasons why this will not be effective in this case are pointed out briefly below.

- Coordination will not be very strong in LP due to the composed team of different countries
- Such type of poor coordination may result in mismanagement of the LP area.

Figure 5.3: Conceptual image of Staggered Border Layout

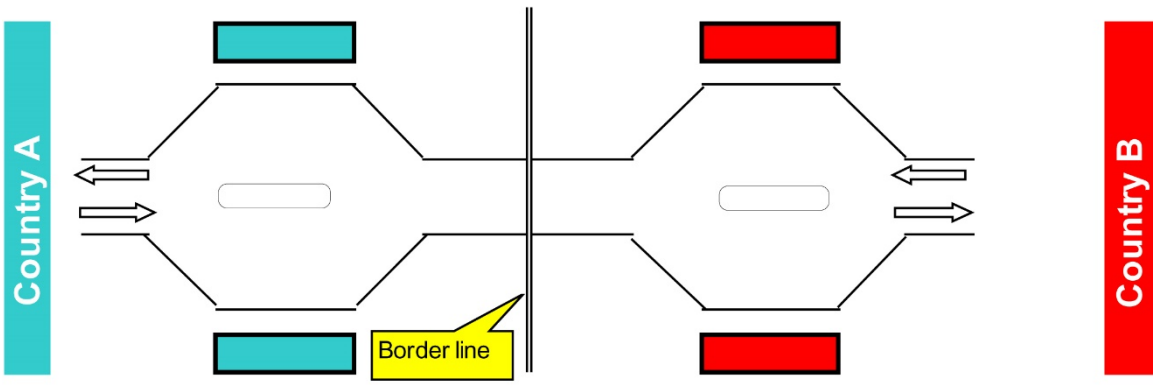


- **Traditional**

Traditional Border Layout has been suggested at Sheola by the team of consultants because it offers many facilities here.

- This type of LP has a wide level of acceptability because both has a long history of using such method of border management
- Infrastructure like Road and Truck Terminal has been set up already in Indian side
- Handling of goods/vehicles/labors is more effective and easy in this method
- Cross border coordination is required at a reduced level
- Inter-ministerial correspondence is required at a limited level that will increase the speed of operation at any level
- Only road development is required to get maximum benefit from this type of management
- LC stations of both of the countries will enjoy absolute independence functionally and operationally
- Land port authority will be able to execute and exercise their command at a highest level
- Above all, all of these facilities and advantages would be made possible only with this option
- An option for transporting freights via railway is still there with construction of only 9 km railway line.

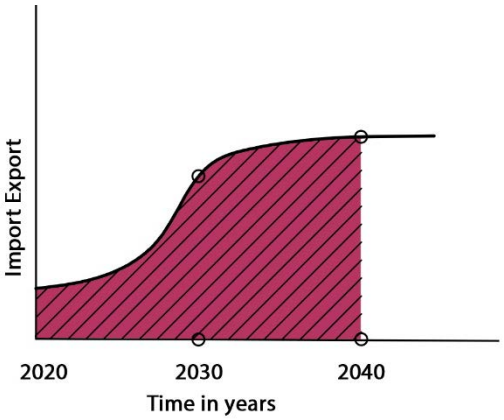
Figure 5.4: Conceptual image of Traditional Border Layout



Direction of Planning

- **Target Year Planning-** As per the prediction of traffic volume forecast of import/export will increase exponentially until 2040. After which it is predicted the traffic demand will became stable. Therefore considering the traffic demand forecast the planning is targeted to fulfill demand of 2040.

Figure 5.5: Traffic Demand Forecast for the Target Year

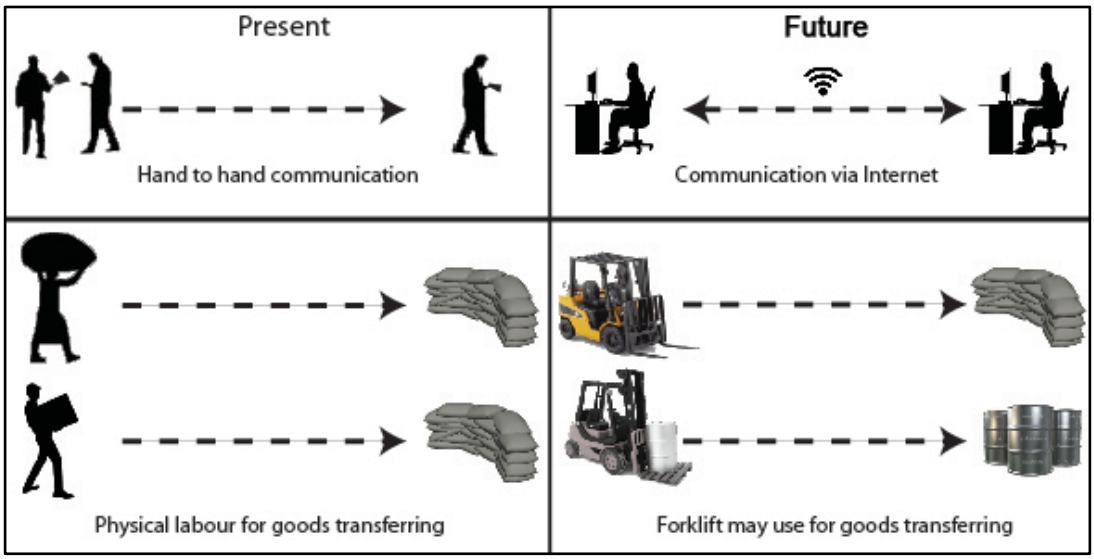


Source: Calculated by the Consultants

- **Flexibility in Planning-**It is important to acknowledge that with time commodity growth / demand may vary from current time. ex. Demand of coal may fall and demand of other commodities may rise therefore keeping the traffic flow undisturbed from 2030 commodities has been kept open to accommodate different goods. In order to keep the planning flexible.
- **Land acquisition-** Land acquisition is planned to be completed before the start of the construction phase. The planning and development of the Port would be done in phases to accommodate the traffic demand forecast growth, but all land has to be acquired beforehand because with any development of the port surrounding land price will rise. Making it not feasible for the project. Also in later phase of the project any development or any business growth would be difficult to relocate. If land is not acquired beforehand. It will also not be socially or economically feasible to relocate these new developments. Hence also Land acquisition must be made before the beginning construction phase.
- **Operational Concept-** It is essential that the design of the port incorporate all new port. Port function and has provision to adopt / compatible new technologies. In order to be an international Land port. It is essential that mechanical systems are introduced to the port that is using forklifts instead of using human labor for shifting/maneuvering goods. Also using mechanical support will save time and space resources. But it is essential to understand the socio-cultural aspect of the port therefore introduction of the new technologies and I.T solution should be done in small scale.

  Once the workers are accustomed to the new technologies it should be slowly expanded though out the port. New port functions are an essential part for the success of the port design because when the international corridor between the neighboring countries will be opened it is predicted that commodities demand will change. To comply with international standard. It is a must that provisions for new port function are designed for.

Figure 5.6: Future mode of Communication and goods transferring



Source: Prepared by the Consultants

5.3. Planning Concept

For the Planning concept, best practices of Land Port in Korea / Hong Kong(Attached in annexure) were studied from which it was found that when different departments of Land Port [Customs etc.] are installed at different grades (underground, at grade or roof), the port functions very efficiently. However studies suggests that, in different Land Ports of Bangladesh [Benapole, Burimari, Tamabil] these different department caters around the site, which create heavy system loss, making land ports very inefficient. Therefore in this planning all the different department has been integrated under one roof which would save time and enhance efficiency.

5.4. Master Plan

5.4.1. Phase Development

Master plan planning has been proposed in phases to make the project economically feasible. As mentioned earlier traffic forecast and planning has been targeted to 2040, it all the structures are constructed before the target requirement then Land Port will face both financial and resource loss. Also it all the structures are build according to the 2040 forecast in the first phase, the project will lose it flexibility to accommodate any new commodities with time which might lead to maximum port utility failure.

5.4.2. Space Requirement

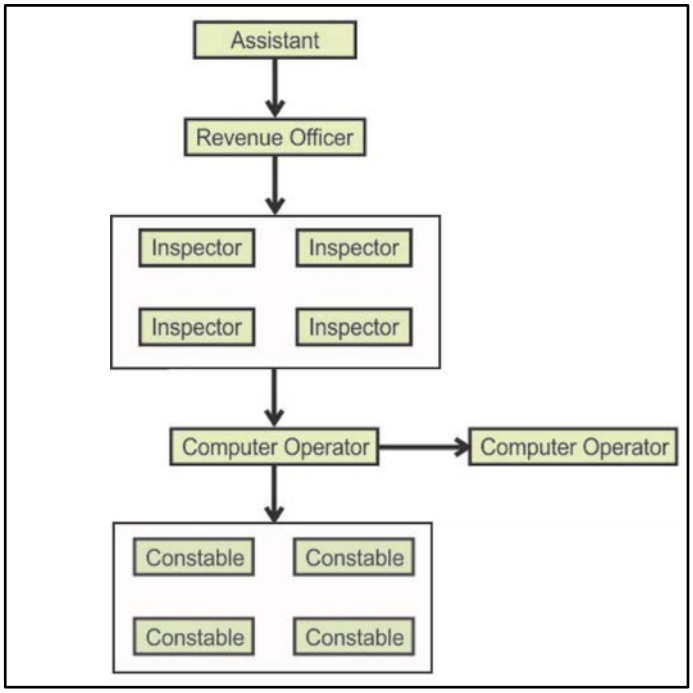
A. Administrative Building

The size of the administrative building was derived from the functional and space requirement of the different bodies that will constitute the port authority and other activities, namely:

- BLPA
- Immigration
- Customs
- Banks
- Labor Union
- Labor Contractor
- Health Inspection
- C&F Association

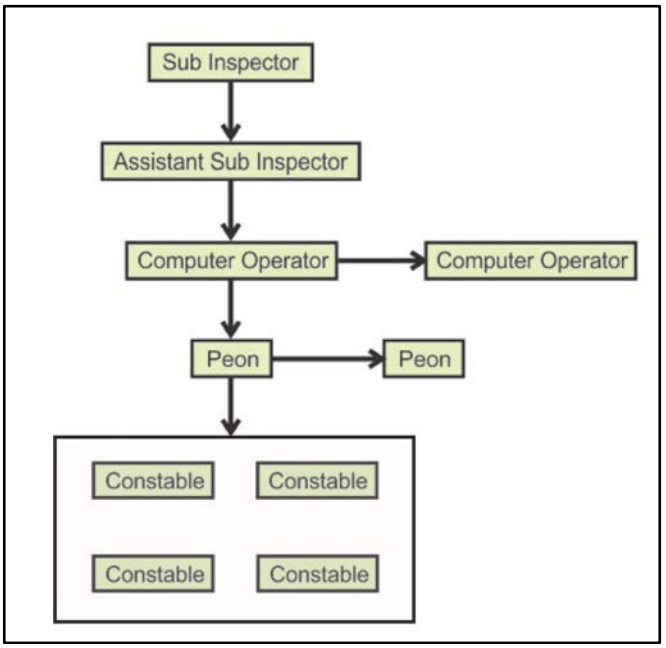
At first, the number of staff is working for BLPA, Customs and Immigration has been calculated. Then, the size of each office has been calculated on the basis of 20m^2/ person.

Figure 5.7: Organization of Customs for Sheola Land Port



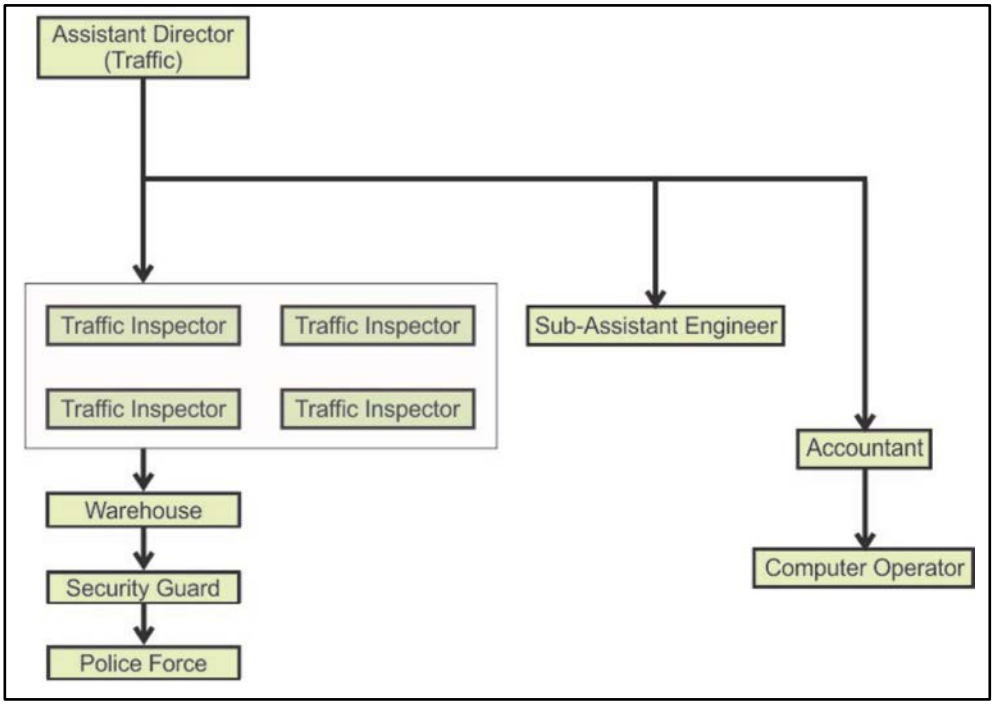
Source: Customs Office, Sheola

Figure 5.8: Organizationof Immigration for Sheola Land Port



Source: Immigration Office, Sheola

Figure 5.9: Organization of BLPA for Sheola Land Port

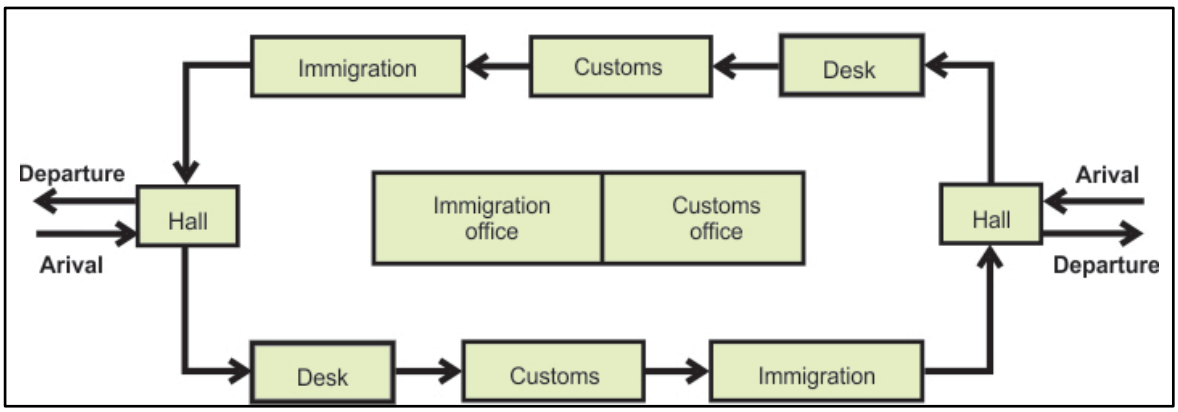


Source: BLPA, 2016

B. Passenger Terminal

The size of the passenger terminal building has been derived from the function and space requirement namely: Immigration customs office; the number of people entering the office and the departure of passenger

Figure 5.10: Passenger Terminal



Source: Proposed by the consultant

C. Warehouse

Mainly perishables goods will be stored in the warehouse and can be stored for 3 days. 30% of the imported goods are stored inside a warehouse.

Volume=1600 Ton= 64000 cft

Height=14’

Area= 4600 sft

Figure 5.11: Calculation for Warehouse

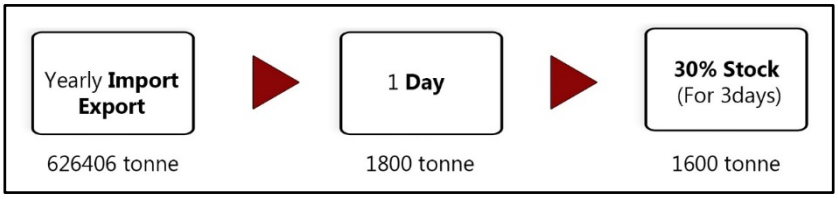
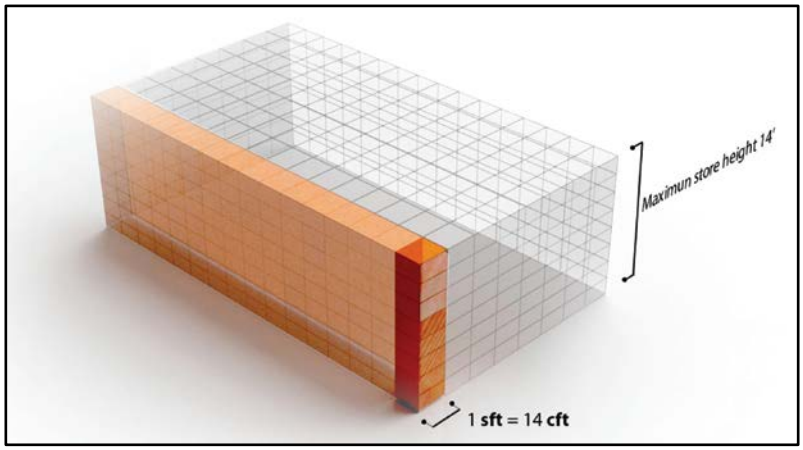


Figure 5.12: Proposed volume for Warehouse



5.4.3. Open Stack Yard

50% of the imported coals are stored in open air. Coals can be stored up to 7 days.

Volume=15700 Ton =628000 cft

Height=8'

Area=78500 sft

Figure 5.13: Calculation for Open Stack Yard

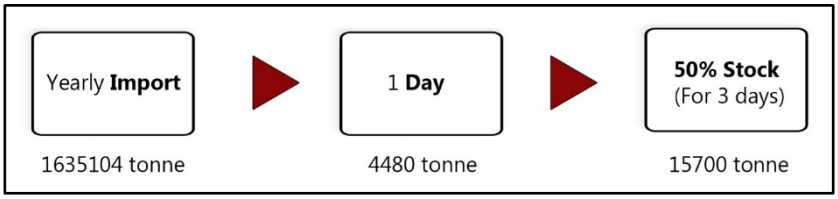
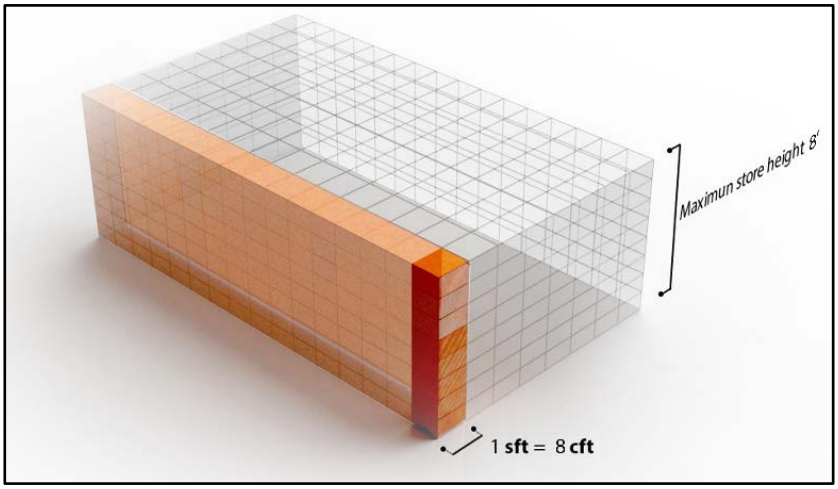


Figure 5.14: Proposed volume for open Stack Yard



5.4.4. Space Program

Space requirement for the functions has been calculated and tabulated in the following table.

Table 5.1: Space Requirement for Sheola Land Port

Function	Detailed Purpose	No. of Floors	Area (Unit: m^2)	Note
Administration	BLPA	2	1000	50 Person
	Immigration	2	80	8 Person
	Customs	1	540	27 Person
	C&F Association	1	100	10 Person
	Banks	1	100	2nos Banks
	Labor Union	1	50	
	Labor Contractor	1	50	
	Health Inspector	1	50	
	Transport Association	1	50	
	Canteen	1	150	100 Person
	Common Area	2	550	Hall,Toilet,Storage
	Sub Total		**2720**	
Port	Warehouse	1	2250	General, Acidic, Chemical
	Quarantine	1	1000	Plants/Livestock
	Transshipment Yard	1	2000	
	Open Stack Yard		6000	Stone/Coal
	Indian Parking Yard		1500	60 Trucks
	Truck Wash Area 1		50	
	Bangladesh Parking Yard		1500	60 Trucks
	Truck Wash Area 2		50	
	Weighing Bridge 1		30	
	Weighing Bridge 2		30	
	Detailed Inspection	1	100	
	Sub Total		**16510**	
Supporting Facilities	Security Guard 1	1	20	
	Security Guard 2	1	20	
	Border Barrack	1	20	
	Dormitory for Drivers	1	250	10 Rooms with 4 Person
	Restaurant	1	80	30 Person
	Guest House	1	250	6 Double Room 2 VIP Room
	Medical Center	1	50	
	Shop	1	50	
	Subtotal		**840**	
	Total		**18950**	

Source: Calculated from Survey Data

5.4.5. Land Use Alternative

Alternative-1

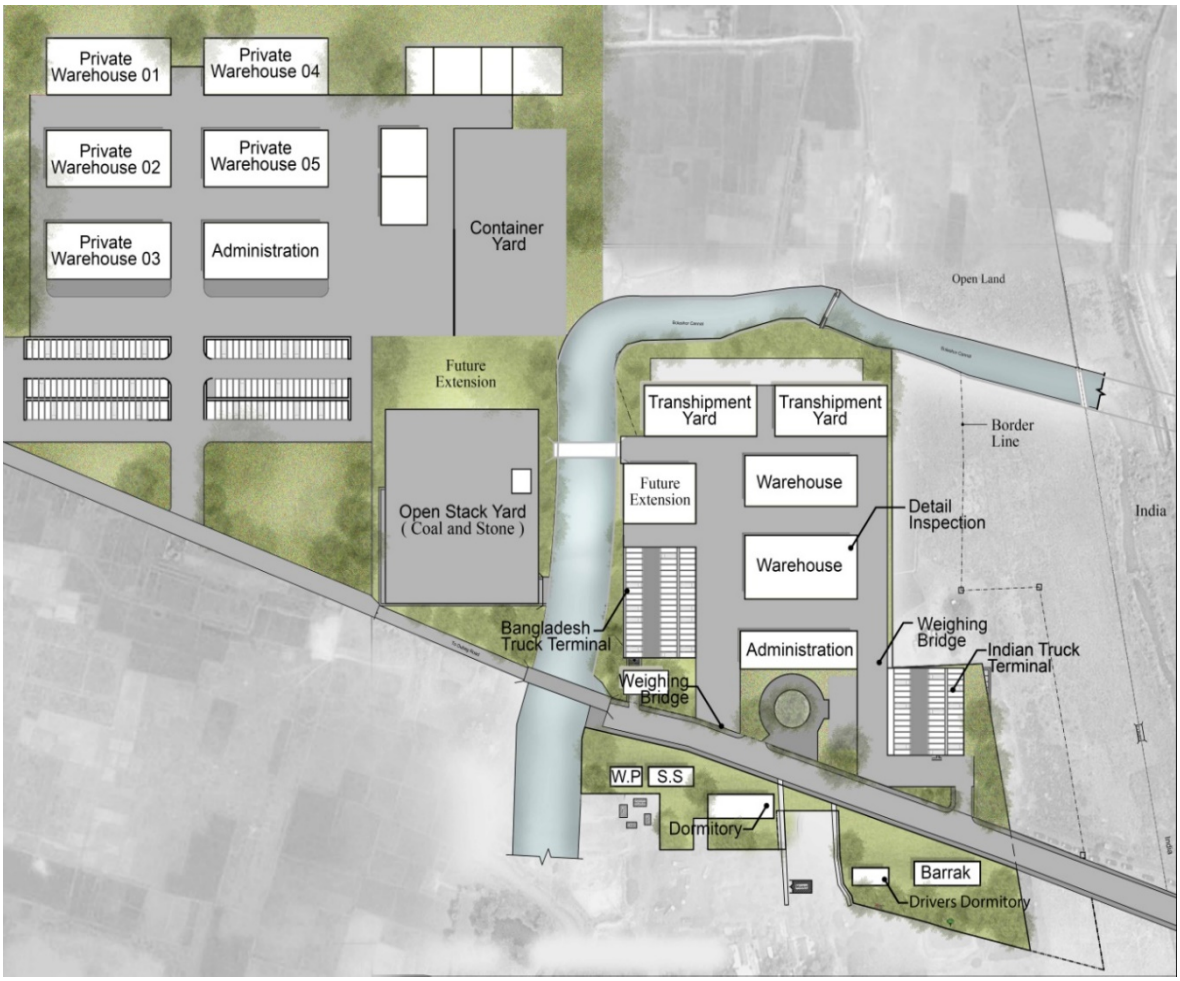
Total Site Area: 43.30 Acre
Sheola Land Port Area: 18.42 Acre
Dry Port Site Area: 21.13 Acre
Service Area: 3.6820 Acre

In this layout option, functions such as Administration, Indian Truck terminal, Transshipment yard shed, 1 storied warehouse and services will be allocated on Eastern side of the Boleshor canal. On the other side of the canal, Bangladesh truck terminal, Open stack yard, Private warehouse and container yard have been allocated. Private ware houses would be set up for rent for storage purposes. The canal will act as a buffer between Open stack yard and rest of the functions.

The proposed dry port will include private warehouse for storage facilities and the container yard. It will come up with two benefits:

1. The warehouse can be sold to the private company which will benefit BLPA financially and will be very lucrative.
2. The modernized new Sheola dry port will be helpful to develop the trade between Bangladesh and India.

Figure 5.15: Diagram Showing Alternative Plan-1 for Sheola Land Port



Source: Developed by the Consultants

Alternative-2

Total Site Area: 22.1 Acre

Sheola Land Port Area: 18.42 Acre

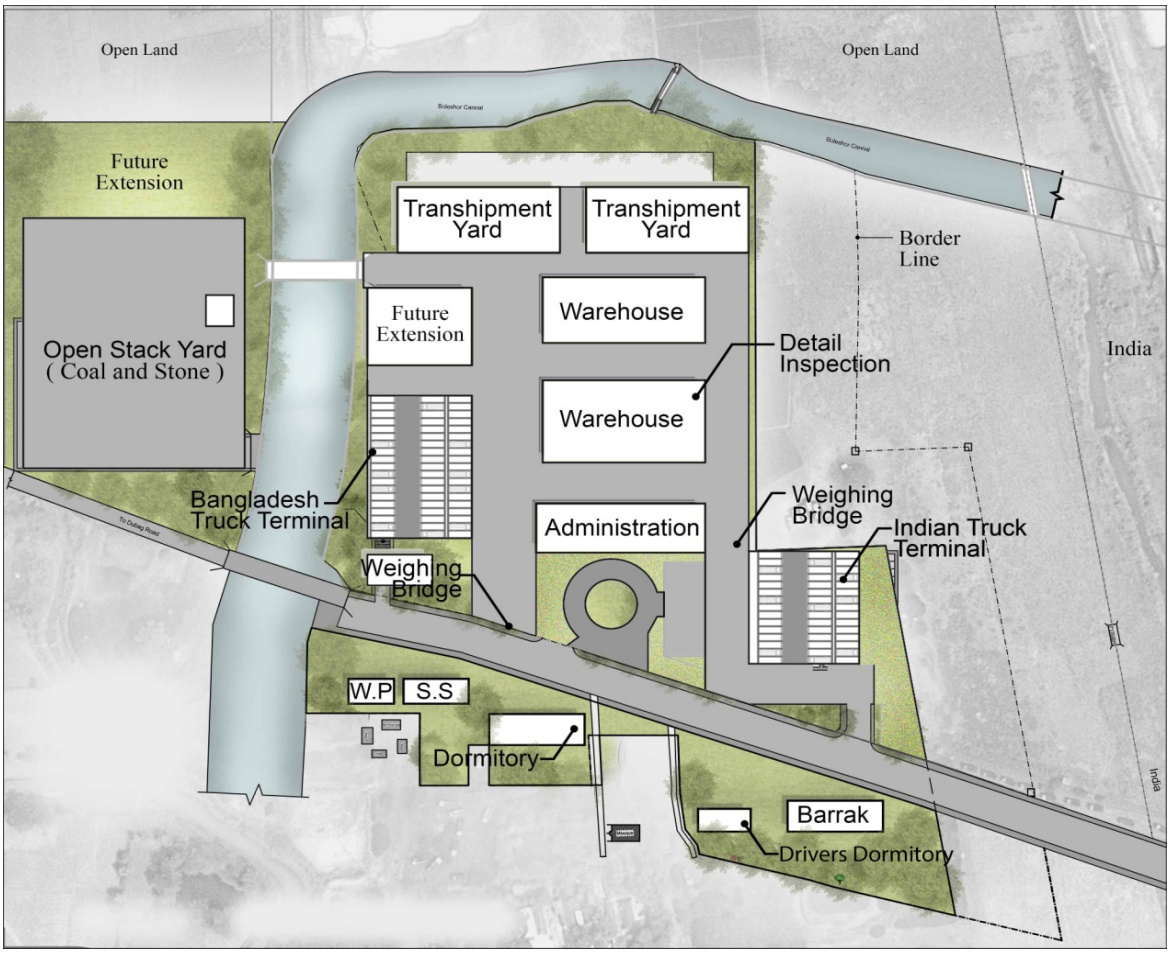
Service Area: 3.6820 Acre

In this layout option, Admin, Indian Truck terminal, Transshipment yard shed, 1 storied warehouse, Services and Bangladesh truck terminal would be allocated on the Eastern side of the Boleshor canal. Open stack yard will be on the other side of the canal.

The proposed buffer zone (green area) could reduce the noise and pollution from the Land port. The service area would include:

- Dormitory/Restaurant
- Substation/Water pump
- Guest House

Figure 5.16: Diagram Showing Alternative Plan-2 for Sheola Land Port



Source: Developed by the Consultants

Alternative-3

Total Site Area: 22.1 Acre
Sheola Land Port Area: 18.42 Acre
Service Area: 3.6820 Acre

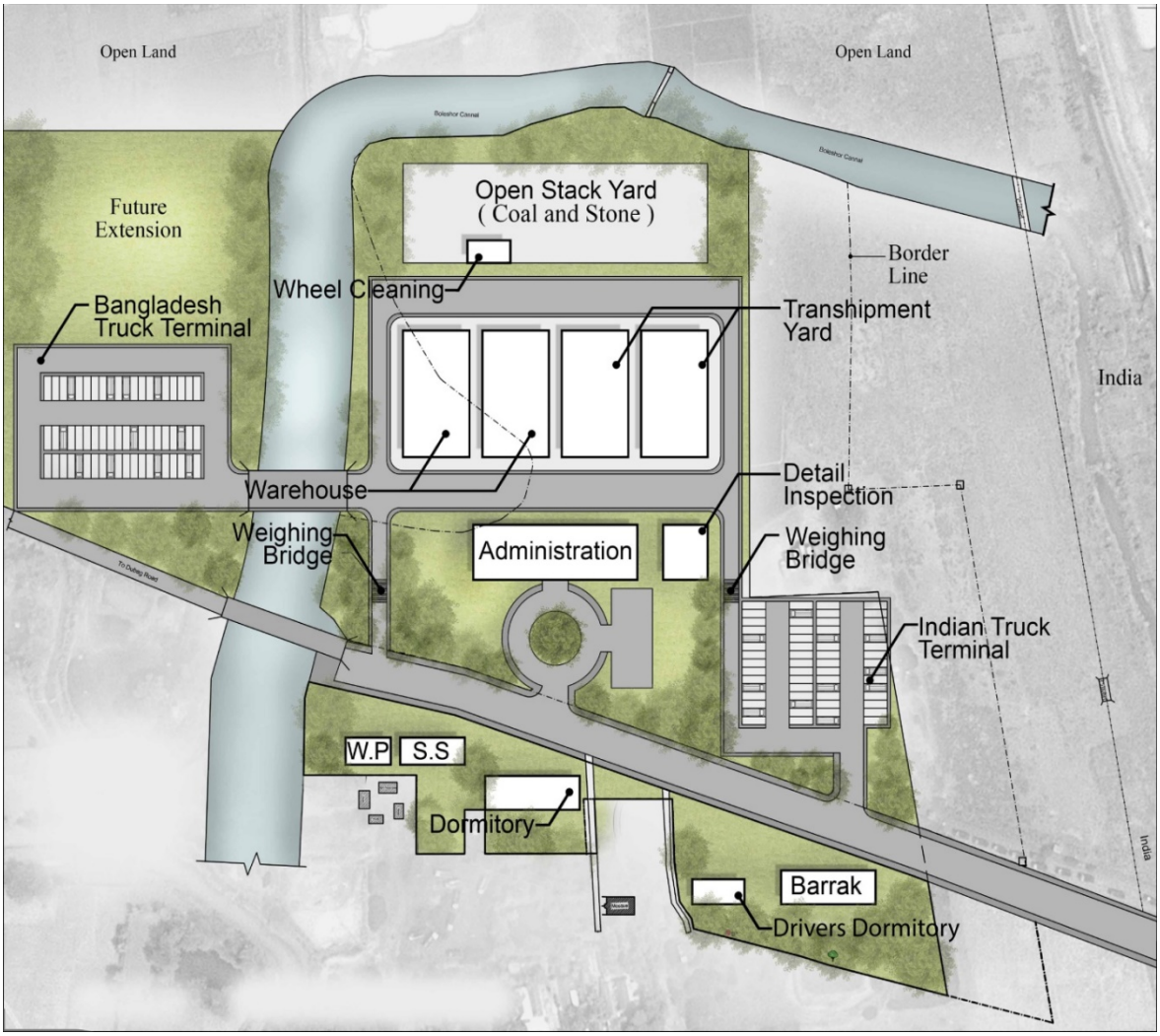
The functions and circulation are simplified in option 3. Indian and Bangladesh truck circulation don't overlap in this option.

In this layout option, Admin, Indian Truck terminal, Transshipment yard shed, 1 storied ware houses, Services and open stack yard will be allocated on the Eastern side of the Boleshor canal. Bangladesh truck terminal will be on the other side of the canal.

The proposed buffer zone (green area) could reduce the noise and pollution from the Land port. The service area will include:

- Dormitory/Restaurant
- Substation/Water pump
- Guest House

Figure5.17: Diagram Showing Alternative Plan -3 for Sheola Land Port



Source: Developed by the Consultants

Comparison

From Alternative-01, it has been analyzed that it has excellent land use capacity, Function and future expansion capability with moderate circulation and poor cost efficiency.

Alternative-02 gives excellent land use capacity and cost efficiency with moderate function, circulation and future expansion flexibility.

Alternative-03 offers excellent land use capacity, function, circulation and cost efficiency with moderate future expansion flexibility.

Analyzing the comparative chart, the consultants' team decided to develop Alternative-3 which has the strength in

- Compatible Land use
- Good Function
- Clean Circulation and
- Reasonable Construction Cost

Following figure shows the Comparison of the alternatives (1, 2 and 3) in a tabular form.

Figure 5.18: Comparison of Alternative 1, 2 and 3

Option	Land Use	Function	Circulation	Future Expansion	Environmental	Social	Economical
Alternative 1	●	●	▲	●	▲	●	▲
Alternative 2	●	▲	▲	▲	●	●	●
Alternative 3	●	●	●	▲	●	●	●

● Excellent ▲ Good ✕ Poor

Source: Developed by the Consultants

5.4.6. Operational Plan

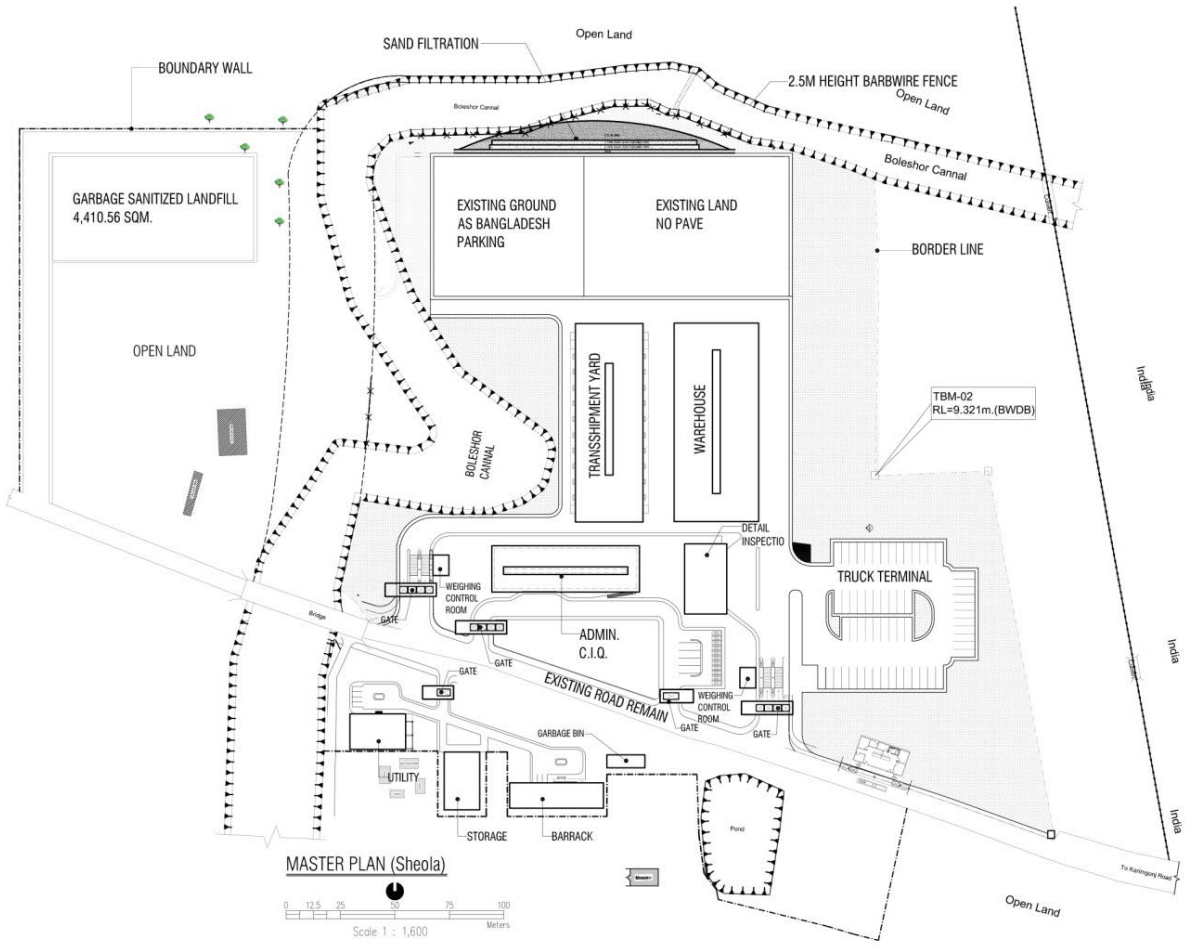
A. Phase 1

Sheola Land Port will be developed into two phases. Phase 1 is for target year 2030. For phase 1, the essential facilities that needs to be operated for the land port are Administration building), 1 warehouse, 1 transshipment yard, Indian truck terminal, Temporarily Bangladesh truck terminal

B. Phase 2

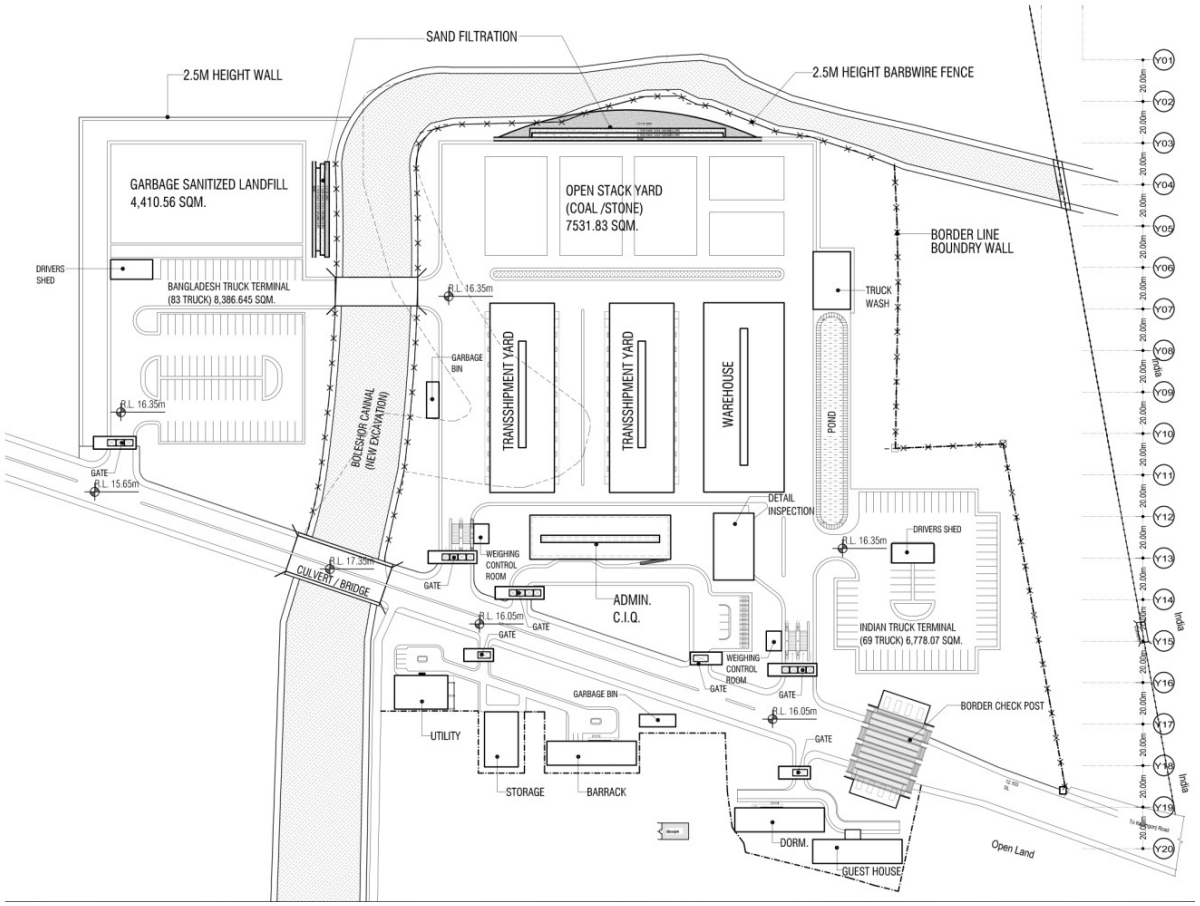
Phase 2 is for target year 2040. For phase 2 all facilities that needs to be operated for the land port has to be build are shown in Figure 5.19.

Figure 5.19: Operational Plan for the First Phase



Source: Developed by the Consultants

Figure 5.20: Operational Plan for the Second Phase



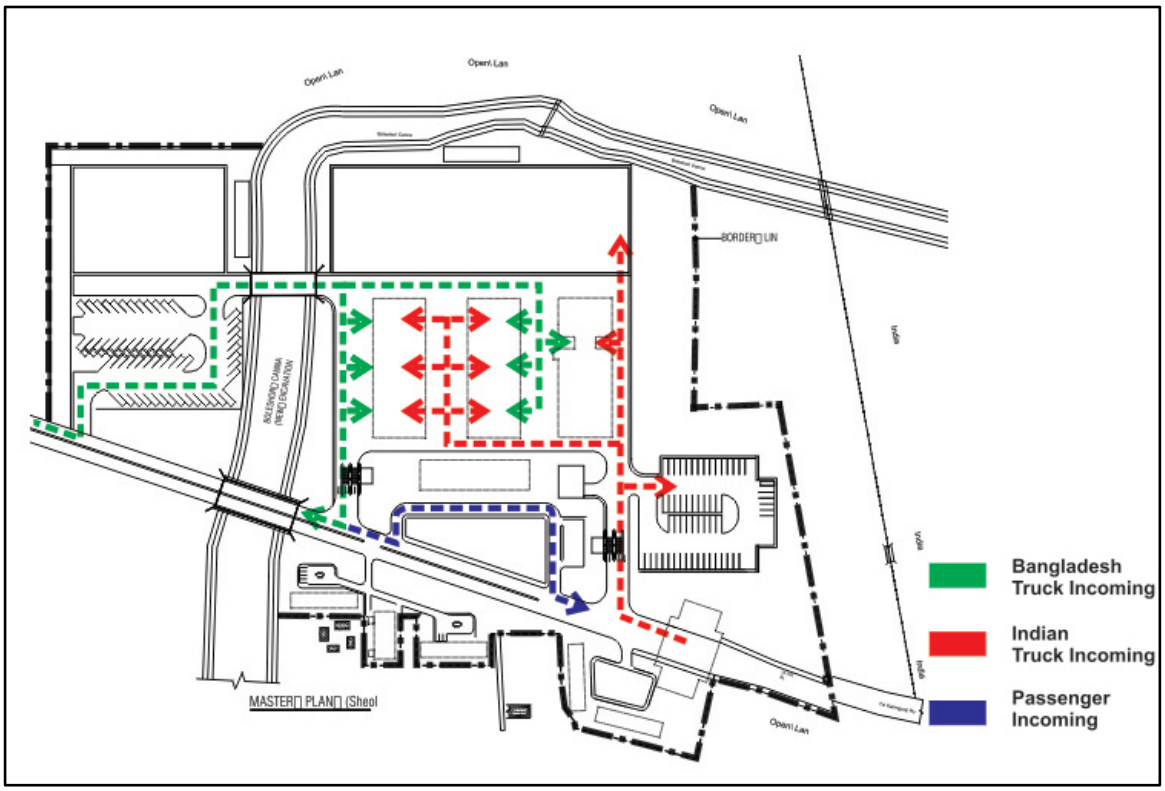
Source: Developed by the Consultants

5.4.7. Cargo Circulation/ Passenger Circulation

Indian Trucks unload goods to warehouse/transshipment yard or unload coals and stones on the open stack yard. They return to India afterwards.

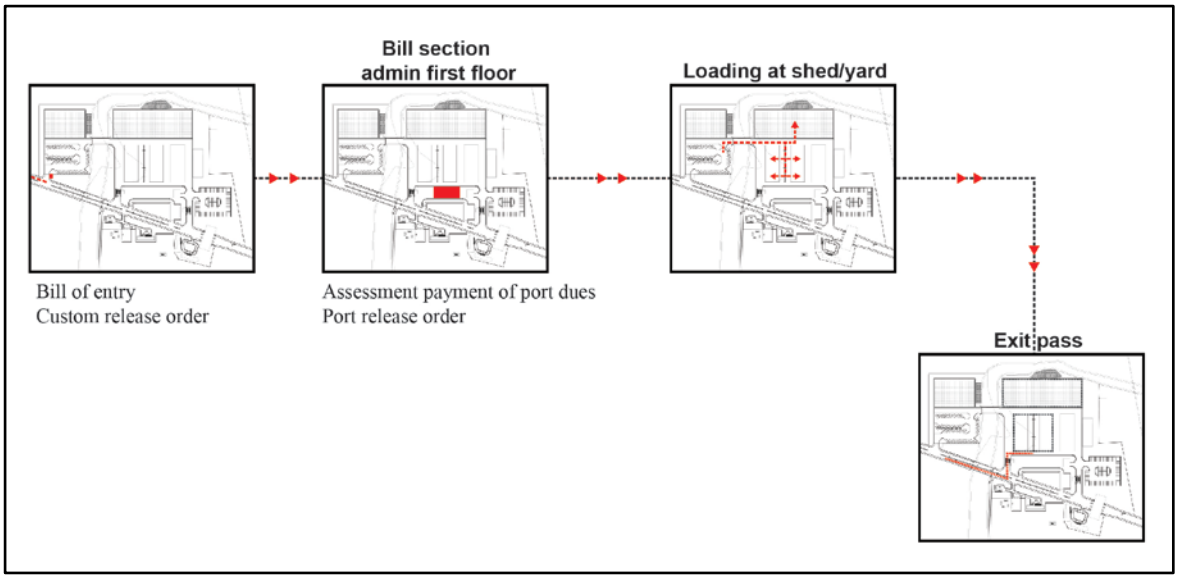
Bangladesh Trucks load goods at the warehouse/transshipment yard or load stone and coal at the open stack yard.

Figure 5.21: Circulation Plan within the Site



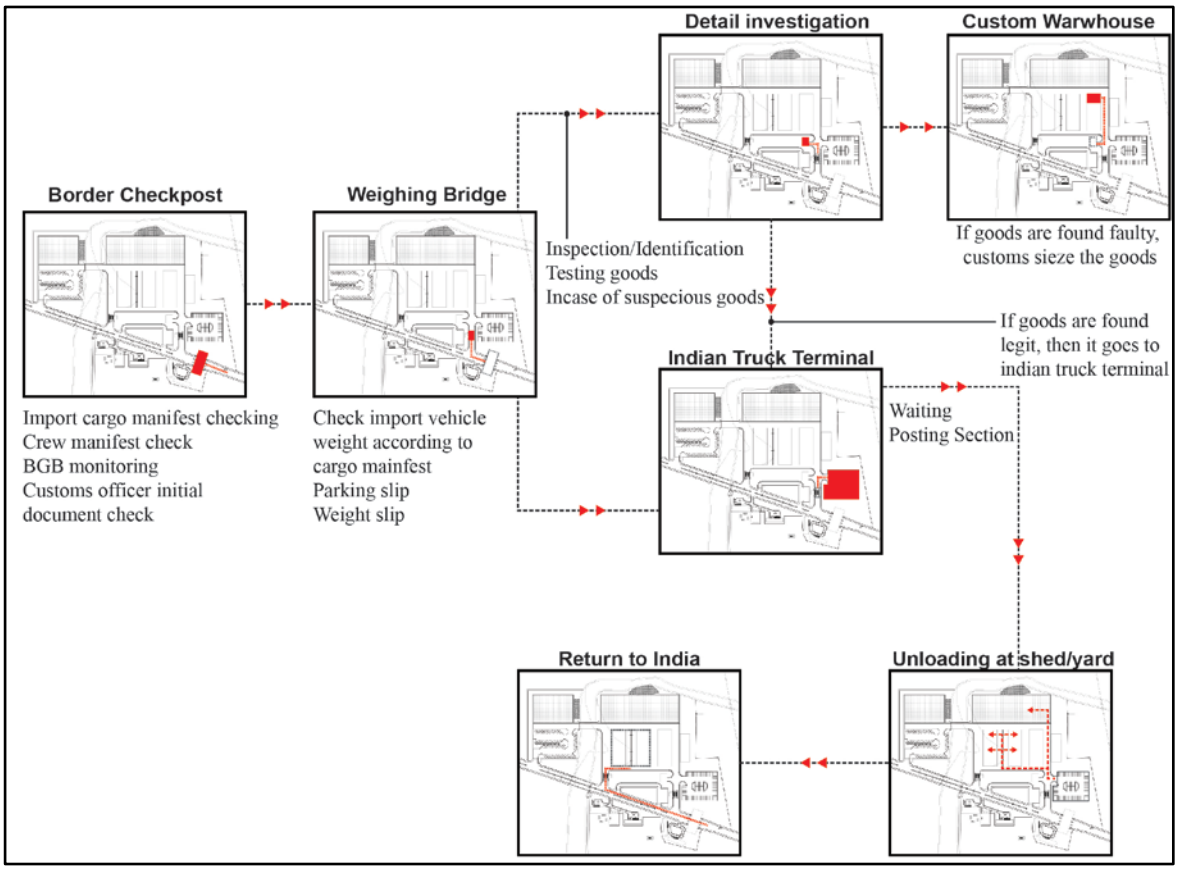
Source: Developed by the Consultants

Figure 5.22: Cargo Collection Pocess



Source: Developed by the Consultants

Figure 5.23: Cargo Delivery Process



Source: Developed by the Consultants

5.4.8. Material Schedule

The material schedule for the project is given the table below.

Table 5.2: Material Schedule

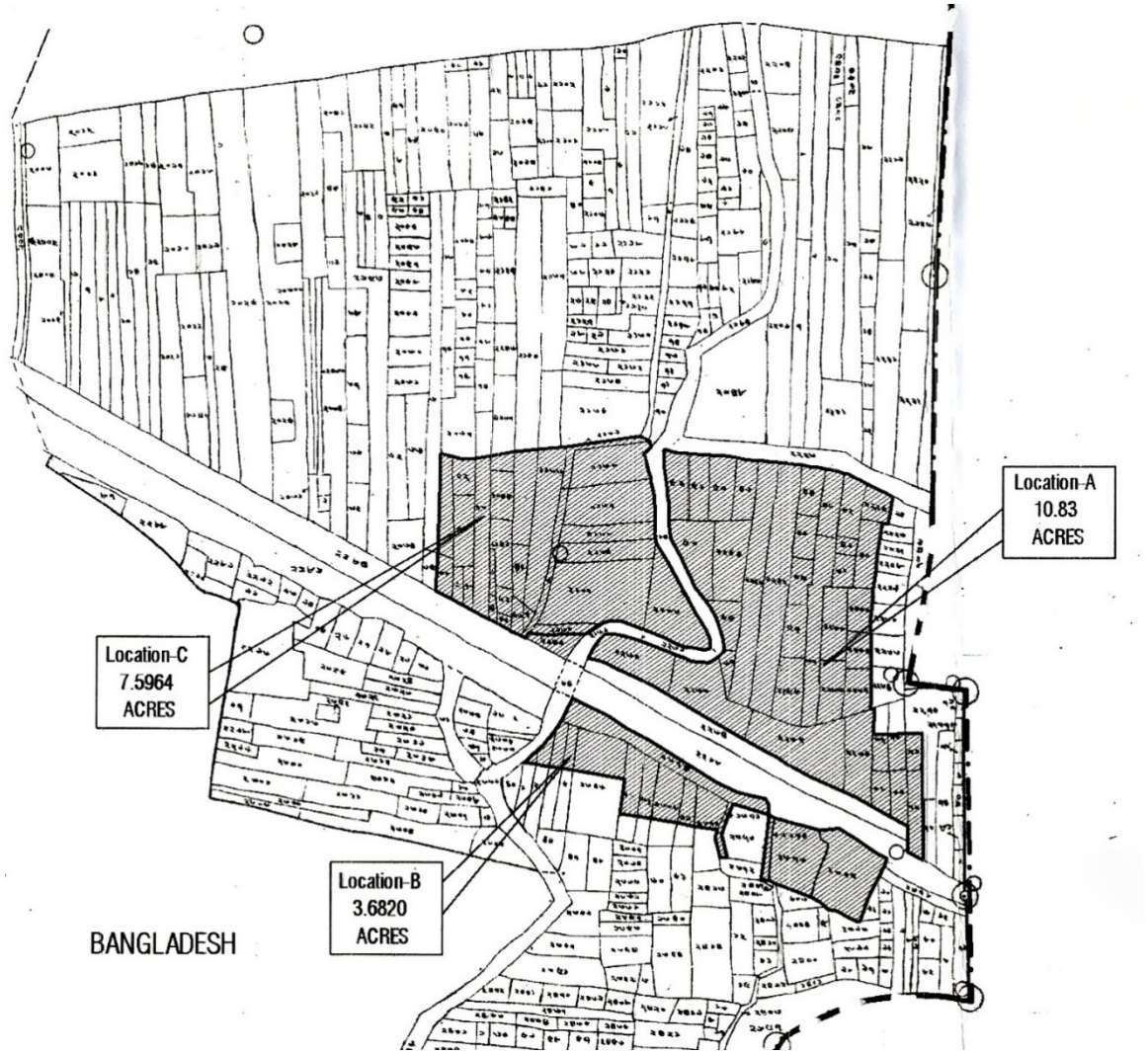
Facility	Floor	Wall	Ceiling	Exterior
Administrative Building	Ceramic Tiles	-Glass Panel -Brick (Plaster Finish)	Sound Absorption Tex	Glass Panel+ Brick Cladding
Ware House	Epoxy Paint Floor	Brick wall with plaster finish +paint	Exposed Truss	Brick Cladding
Guest House Dormitory Barrack	Ceramic Tiles	Brick wall with plaster finish	RCC ceiling with plaster finish	Brick Cladding
Detailed Inspection	Epoxy Paint floor	Brick wall with plaster finish	RCC ceiling with plaster finish	Brick Cladding
Substation	Epoxy Paint floor	Brick wall with plaster finish	RCC ceiling with Plaster finish	Brick Cladding
Guard Kiosk	Ceramic Tiles	Brick wall	RCC ceiling with Plaster finish	Brick Cladding

Source: Developed by the Consultants

5.4.9. Land Acquisition

Realization of the project will require some of the lands to be acquired. Considering various parameters, the site was selected. The following Mauza Map is showing the acquisition proposal that will be required for this land port.

Figure 5.24: Land Acquisition Plan on RS Mauza Map



Source: Deputy Commissioner office, Sylhet

5.5. Structural Design

Strength, stability, stiffness and serviceability requirements has been considered while designing reinforced concrete structural elements. Members are proportioned for adequate strength using load factors and strength reduction factors as prescribed in BNBC, 1993 and ACI 1996. The building structure is idealized as a modular type structure having moment resisting frames. A moment resisting frame is identified by the prominence of its flexibility due to the flexure of the individual beams and columns and the rotation at their joints. The strength and stiffness of the frame are proportional to the column and beam size and inversely proportional to the story height and column spacing. The foundation system would be considered based upon verification of sub-soil investigation report.

The particulars of the structural systems involved are as follows:

a. Slab-Beam/Slab System: The floor slabs are framed with rolled secondary beams and carried to the vertical supports by built-up girders. They are designed as one way composite slabs with 1-1/2 hour fire rating to eliminate the need for spray applied fireproofing to the deck slabs.

b. Beams: Moments, Shears and deflections of beams due to the superimposed loads from slabs have been determined using determinate beam analysis and composite framing design when applicable. Computer programs has been used to assist the analysis and design.

c. Columns: Columns have been designed to resist the axial forces from the factored loads on all floors. Typically, columns support vertical loads only, except when engaged by outrigger elements.

5.5.1. Structural Design Criterions

A. General

The basis of any sound and efficient structural design lies in the following considerations.

i) to utilize and accommodate the laws of nature,
ii) to efficiently utilize the principles of engineering and structural mechanics,
iii) to combine safety with economy,
iv) to blend structural form, material and construction technique efficiently and
v) to utilize as much as possible low-cost indigenous technology and materials.

The proposed structural design for the project has been considered in conformity with these consideration in order to arrive at the most effective and economical solution.

The architectural design of the complex has resulted in separate structural units. While the various facilities have been combined to form an integrated architectural system, the conceptual basis for structural design has been to have low-rise discrete integrated units rather than to build an integrated complex high-rise structure. This will result in an efficient use of materials and an economic construction methodology. Efficient utilization of space by house buildings having identical functional requirements is a prerequisite for economic design of a project.

The design criteria for the buildings has been in accordance with the following codes:

i) Bangladesh National Building Code, 1993
ii) ACI Code 1977, 1983, 1989 and 1996 to be used if necessary.
iii) Loading as per ASCE 7-88 (Minimum Design Loads for Buildings and Other Structures) and standard practice.
iv) British Standard Code BS 8110: Part 1, 2 & 3, 1985 to be used if necessary.
v) UBC, Uniform Building by-Laws (Latest Edition)
vi) BS 5950: 1985, Structural Use of Steelwork in Building
vii) BS 5135, Metal-Arc Welding of Carbon and Carbon Manganese Steels
viii) BS 1881, Method of Testing Concrete
ix) BSCP111, Structural Recommendations for Load Bearing Walls
x) BS 4466, Bending Dimensions and Scheduling of Bars for the Reinforcement of Concrete
xi) S 8007, Design of Concrete Structures for Retaining Aqueous Liquids

B. Loading

Dead Loads

The minimum design dead load for buildings and portions thereof has been determined in accordance with the provisions given in the Chapter-2 of BNBC. In addition, design of the overall structure and its primary load-resisting systems conform to the general design provisions given in Chapter-1 of BNBC. Dead load for a structural member has been assessed based on the forces due to:

i) Weight of the member itself,
ii) Weight of all materials of construction incorporated into the building to be supported permanently by the member,
iii) Weight of permanent partitions, and
iv) Weight of fixed service equipment.

Live Loads

The live loads used for the structural design of floors, roof and the supporting members has been the greatest applied loads arising from the intended use or occupancy of the building, or from the stacking of materials and the use of equipment and propping during construction. The Live loads as anticipated for the occupancy of each area has been determined in accordance with the provisions given in the Chapter-2 of BNBC.

Wind Loads

Wind speeds has been taken from statistical analysis of available meteorological data or Bangladesh National Building Code. Wind loads has been calculated from wind speed selected by methods and formulae in Bangladesh National Building Code or American Society of Civil Engineers, ASCE 7-88, 1988.

Earthquake Loads

Seismic zoning and earthquake loading has been in accordance with “Seismic zoning Map of Bangladesh and Outline of a Code of Practice Earthquake Resistant Design of structures, 1979” published by the Geological Survey of Bangladesh or with the Bangladesh National Building Code.

Self-straining and other forces

Self-straining forces such as temperature and shrinkage forces, hydrostatic forces and soil pressures has been adequately considered in accordance with good practice and accepted standards.

C. Materials

Structural materials have been mainly reinforced concrete, Pre engineered Steel and brick masonry.

Reinforcing steel is structural grade plain round bars and high strength deformed bars.

Concrete has generally been made of Ordinary Portland Cement, local and Sylhet sand and brick jhama chips or crushed stone.

Brick masonry work has been done with first class burnt clay bricks and cement-sand mortar

All these are locally available materials has a proven strength and performance. Local craftsmen are familiar with their use and application. Their use will ensure cost-effectiveness as well as performance, strength and durability.

1. Concrete

Normal weight concrete with fcu as follows:	
C20 Mpa at 28 days	Topping slabs
C30 Mpa at 28 days	Foundation walls and footings
C35 Mpa at 28 days	Structural slabs and beams
C50 Mpa at 28 days	Column and core walls

2. Reinforcing Steel

BS449, high tensile bar type 2 (460 Mpa)

3. Structural Steel

Beams Girder and Columns	BS 4360, grade 50, B and C
High strength bolts	ASTM A325m and A490M or equal

4. Structural Design Data

Elevator core, hallways, lobbies	5.0kpa
Offices, restrooms	2.5 kpa
Mechanical levels, machine rooms (or equipment weight, whichever governs)	12.0 kpa
Commercial, retail, restaurants	7.5 kpa
Pedestrian plaza	5.0 kpa
Parking	2.5 kpa
Plaza (heavy truck access)	12.0 kpa

Superimposed Dead Loads	
Gypsum Board Partitions (where specified)	1.0 Kpa
Brickpartitions (where specified)	3.0kpa
Mechanical/Electrical	0.25kpa
Ceiling	0.25kpa

Lateral Loads	
Wind	Basic Wind Speed equals 260 kilometers per hour, Importance Factor of 1.0
Notional	Per BS 8110 1.5 % of floor mass applied horizontally at each respective floor level of the building.
Lateral Forces	Lateral forces are carried by the roof and floor diaphragms to the shear walls and frames

5. Form Camber

Camber beams and Slabs for theoretical deflection

6. Curtain Wall Installation

The curtain wall connections has been account for construction tolerances, edge of structure deflections, and lateral movements between adjacent floors perpendicular and or parallel to the curtain wall.

7. Column Shortening

In high rise construction, column shortening has been occurred due to the weight of the construction above. The shortening has been continued until all of the dead load is on the structure, including the cladding. Special construction techniques has been required to ensure the structure within standard construction tolerance.

8. Foundation

Soils engineer has confirmed that the piles are capable of supporting the specified capacity.

9. Special Inspection

The following items required special inspection. See the specifications for additional requirements for special inspection and testing.

#	**Item**	**Description**
a.	Concrete	Concrete is part of the structure
b.	Bolts Installed in concrete	bolts anchor installation
c.	Reinforcing steel	A. Placement of reinforcing steel B. splicing of reinforcing by butt welding, exothermic welding process or threaded couplers
d.	Steel	A. High strength bolt installation B. Welding C. Primary framing which is part of the structure

#	Item	Description
e. g.	Piling Special grading, Excavation and piling	By soils engineer A. Foundation excavation and bearing and strata B. Back-filling behind structural walls or supporting slab -on-grade

10. Quantities

The quantities shown in the drawing are intended for comparative cost studies, approximate building pricing and general information for the building towers at a schematic phase only. Gross assumptions has been made for quantity estimations and unit prices. Care should be taken when using the quantity and cost information by recognizing its intended use for the building tower studies during schematics further project development and design may change quantities and unit pricing shown in drawing.

D. Structural Analysis

The structural analysis of the various units will be performed on the basis of elastic behavior as recommended by most codes. Satisfaction of equilibrium and compatibility requirements has been ensured in all analysis. Analysis of the structural systems has been made for determining the load effects on the resisting elements and connections, based on well-established principles of mechanics taking equilibrium, geometric compatibility and both short and long term properties of the construction materials into account.

For statically indeterminate systems, an exact analysis has been performed using matrix displacement methods. For analysis of continuum or the more complex systems, the finite element method has been used, if considered necessary. For this purpose 2-Dimensional & 3-Dimensional modeling of building frame has been performed using the finite element software either SAP90 or STAAD-Pro/ISDS (Rel. 22).

Buildings, foundations and structural members has been investigated for adequate strength to resist the most unfavorable effect resulting from the various combinations as indicated in the Chapter-2 of BNBC.

Lateral load analysis:

1. The towers and podium structures will contain shear walls for lateral resistance combined with outrigger coupling elements at one level in the tower.
2. Each wall contribution to force resistance and stiffness will be determined with the use of extended-three dimensional analysis of building systems (ETABS) program which was developed by computer structure, Inc. of Berkeley, California. ETABS uses the stiffness method of lateral analysis with the following assumption:
    i) Validity of the engineering theory of beams
    ii) Linear material elasticity
    iii) The building structure is idealized as an assemblage of vertical frame and shear wall system interconnected by rigid horizontal slab and diaphragms.

3. The program allows the user to create a computer model of the structure that will include the effects of any diagonal bracing, panel elements, beams and columns with respect to bending, axial, and shear stresses and deformations. The effect of the finite deformations of the beams and columns of the stiffness of a frame system are automatically included in the program. The program is capable of unsymmetrical and nonrectangular structures. Torsional behavior of the floors and their inter story compatibility are also taken into account And thus, a complete three-dimensional displacement compatibility is achieved. Displacement and member forces are included in the output of the program.

5.6. Electrical Design

Inside Land Port Terminal

5.6.1. Major Equipment for Power Supply

The following major equipment for power supply system will be considered**:**

a) **Power Sub-station**

Major components are as follows:

(i) Ring Main Unit for 2nos. 11KV Incoming Feeders

(ii) Medium Voltage Switchgears (11KV)

(iii) Power Transformers of 2nos. 1600KVA, 11/0**.**415KV, 50Hz,

DYn11, dry type cast resin & maintenance free

(iv) Low Voltage (LV) Switchgears

(v) Power Factor Improvement Plants

b) **Overhead Incoming Expressed 11KV Feeder**

(i) From 10MVA 33/11KV, 50Hz substation to proposed Land Port can be **upgrade the existing 11KV over head line into Double**11KV lines with under-built 0**.**415KV & 0**.**230KV lines.

c) **Alternative Compact Emergency Power Source Diesel Generator**

(i) Automatic Transfer Switch /Change-over switch

(ii) Emergency back-up Low Voltage Switchgears

(iii) LV Emergency Distribution Boards

(iv) Under Ground Fuel Reservoir

(v) Natural Gas supply line for Gas Gen. (If Govt. permit)

d) **Renewable Alternative Power Source of Solar system (On-Grid)**

(i) Secure space for Photocell panels

(ii) Controller, Inverters, DC-SDB, AC-SDB & SPD etc.

(iii) DC cabling and fitting & fixing, mounting accessories etc.

e) **Exterior Lighting**

(i) High Mast Lighting for Container Stacking Yard/Coal &Stone Yard

(ii) Boundary wall Lighting, Security Lighting

(iii) Internal Road Lighting, Highway Road lighting,

(iv) Building Lighting, Shed & Truck Terminal Lighting

f) **Under Ground Feeder from substation to Load Points (Power Cable Lines)**

(i) MV, LV and Communication cable

(ii) Cable trench, Manhole & hand hole

5.6.2. Design Conditions & Parameters for Power Supply

Service Conditions

The project area is a hot, humidity and tropical atmosphere. All electrical equipment, cables, accessories, fittings, forming parts of electrical installation shall be fully suitable for use in the following specified service conditions:

(a) Altitude above Mean Sea Level (Approximate): 15meter
(b) Maximum Temperature: 40°C
(c) Mean Temperature: 32°C
(d) Maximum Relative Humidity: 90%
(e) Mean Relative Humidity: 80%

Standard Data

The following standard values for high and low voltage are standard in Bangladesh.

DISTRIBUTION BUS HIGH VOLTAGE: 11KV, MAXIMUM SYSTEM VOLTAGE 12 KV.

LOW VOLTAGE	415/240V LOCAL VOLTAGE 400/231-OPENING VOLTAGE 457V -MAXIMUM PERMISSIBLE VOLTAGE BY PDB/DESA/REB

Frequency

The standard power frequency in Bangladesh would be: 50Hz.

5.6.3. Design & Construction Requirements

All equipment are to be in accordance with the latest recognized rules of workmanship and modern engineering practice.

All parts of the equipment's must be suitable in every respect for continuous operation at maximum output under the climatic conditions as specified above.

Marking of Terminals

The terminals shall be marked in accordance with BS, IEC, VDE or equivalent standards.

Earthing of Equipment

All electrical equipment to be provided with an earthing screw of sufficient diameter or an earthing plate.

High Tension Switchgear

High Tension Switchgear has been proposed to install.

Scope

The switchgear shall be pre-fabricated, complete and ready for erection and suitable for indoor installation of the tropical country like Bangladesh.

Circuit Breaker

The circuit breaker must comply with VDE specifications 0670, Part-102, IEC Recommendations and Publication 56, IEC 695, BS 116, BS 5311 or equivalent ANSI & UTE Specifications.

Current Transformer

Current transformer must comply with BS 3938, VDE 0414 and IEC 185.

Potential Transformer

Potential transformer comply IEC86. The P.T. should be cast resin insulated with appropriate accuracy class and burden minimum 50VA. The P.T. secondary shall be protected with MCB.

Three Phase Power Transformer

The Transformer shall comply with IEC726, VDE 0532 etc. from manufacturer having ISO 9001 and the general specifications will be as follows:

Low Tension Switchgear

The Low Tension Switchgear to be pre-wired, free standing and conforming to relevant IEC standard.

Cable Entries and Terminations

The distribution board shall have provision for the cable fed in and connected in the base. The bottom plate shall be split and removable type to facilitate cable entry having cable grommet.

Current Transformers

All current transformers shall comply with IEC 185 /BS 3938 and shall be of suitable class, rating and accuracy depending on the duty.

Air-Circuit Breakers

The air-circuit breakers shall comply with IEC 947, 157 BS 4752.

5.6.4. Earthing System

The earthing system consists of earth electrode with copper lead, earthing inspection pit and connecting to the specified terminal according to technical specification & guide lines. The whole electrical system including light, fan, regulator sockets sub-station and metal parts incorporated with building electrification shall be earthed.

The earth resistance of the electrodes system shall be to the satisfaction of the local supply authority and shall not exceed in one ohms.

Voltage to Earth divided by 5 into Current rating of the largest over Current protective device.

5.6.5. Generator

DIESEL ENGINE Driven A.C. generator set having a prime power output (continuous rating) standard voltage 230/415 volts, 3-phase, 50Hz, 4-wire at 1500 rpm under condition of normal temperatures and pressures. The manufacturer must have ISO9001. Rated Capacity of D.G sets at 0.8 PF with auto synchronizing, auto paralleling & auto load sharing and all other accessories.

5.6.6. 11/0.415KV, 3-Phase, 50Hz, Substation

Electrical power will be supplied to the substation at the Land Port in the form of Double Feeders or circuits of 11KV, 3-Phase, 50Hz, overhead lines from outside substation. The power lines will terminate at the substation located in the area of the Land Port.

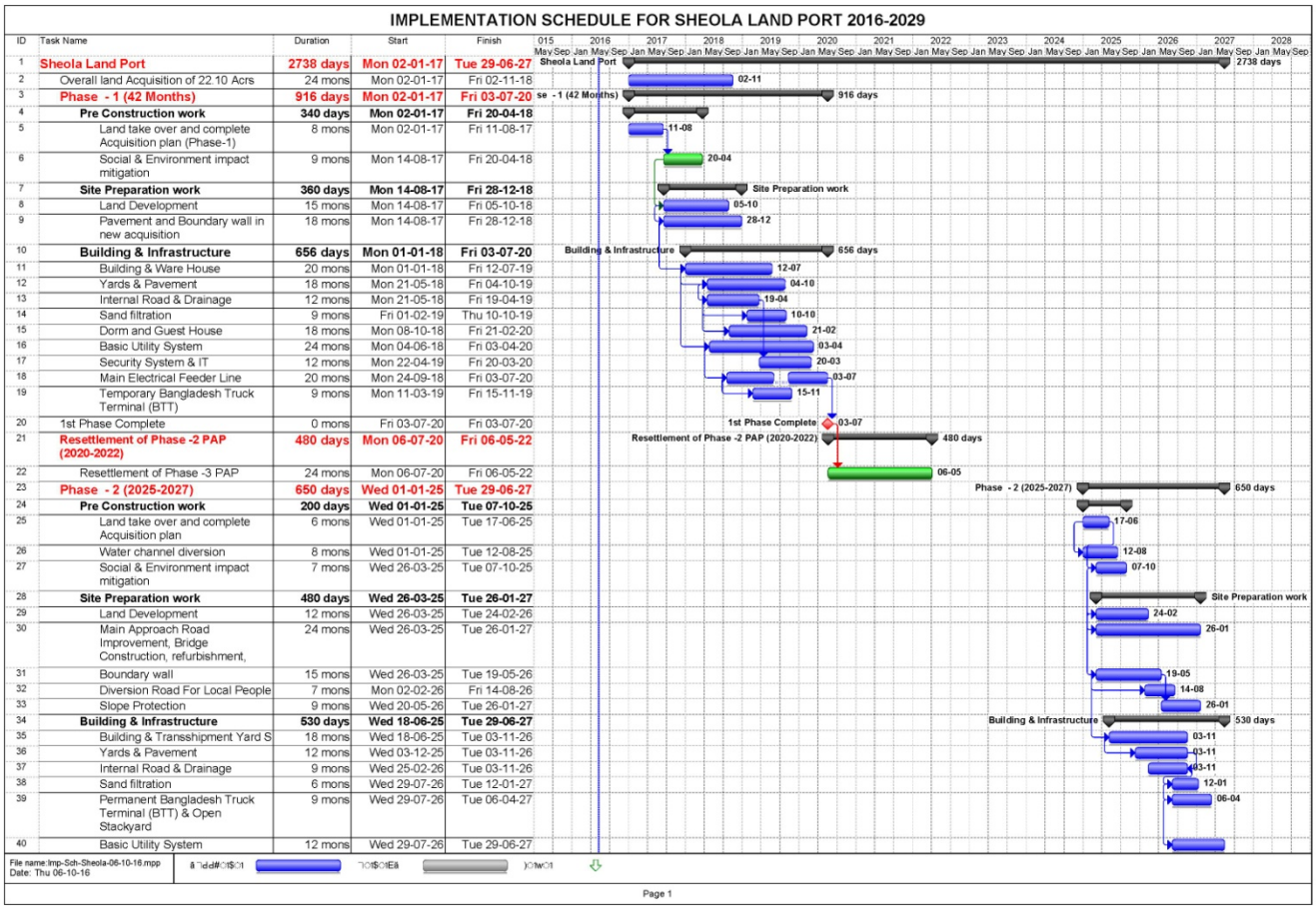
The Electrical power will be supplied from REB 10MVA, 33/11KV substation by the double overhead 11KV Feeders (1no. Feeder is Expressed Feeder & another is 11KV distributed public Feeder) to the proposed 2nos. 1600KVA, 11/0.415KV, 50Hz substation which located at the proposed Land Port project. The Transformers will transform the Voltage level from 11KV to 0.415KV for outgoing feeders which supply the necessary power to administrative building, Indian Truck Terminal, Bangladesh Truck terminal, Tran-shipment shed, Ware houses, futures extension of sheds, Hotel, Restaurant, Dormitory, Gas station, Open Yard for stone & coal, Parking, substation & Generator building, Mast lighting, internal road & high way road lighting, fire hydrant stations, deep-tube-well, STP, WTP, Storm water & rain water drainage pump (if required), Battery Charger for charging Electric Cars, Split A/C & VRF A/C system, water pumps etc. Enclose here with a tentative electric load calculation sheet below:

The following Electrical Load forecast for up-gradation of Sutarkhundi Land Port at Beanibazar Sylhet related to (i) Plumbing system, (ii) Air-conditioning system, (iii) Sanitary system, (iv) Sewerage system, (v) STP system, (vi) Deep-Tube-Well system, (vii) Force Ventilation system & Exhaust system (viii) Firefighting system, (ix) water supply system (x) Pressurized system for fire exit & fire lift lobby in case of fire, (xi) Battery Chargers for Mobile Fork Lift/Car for shifting container, (xii) Yard Lighting, (xiii) Mast Tower Lighting, (xiv) Boundary Lighting & Street lighting, (xv) Building lighting, (xvi) Alternative Power Source like BPDB/REB/PBS-Normal 33KV or 11KV Overhead line, Emergency Diesel Generator Back-up Power and Solar system etc.

5.7. Implementation Schedule

Implementation of the work will take almost three years. A Gantt chart showing estimated time required is given in the following figure.

Figure 5.25: Implementation Schedule for Feasibility Study Report at Sheola

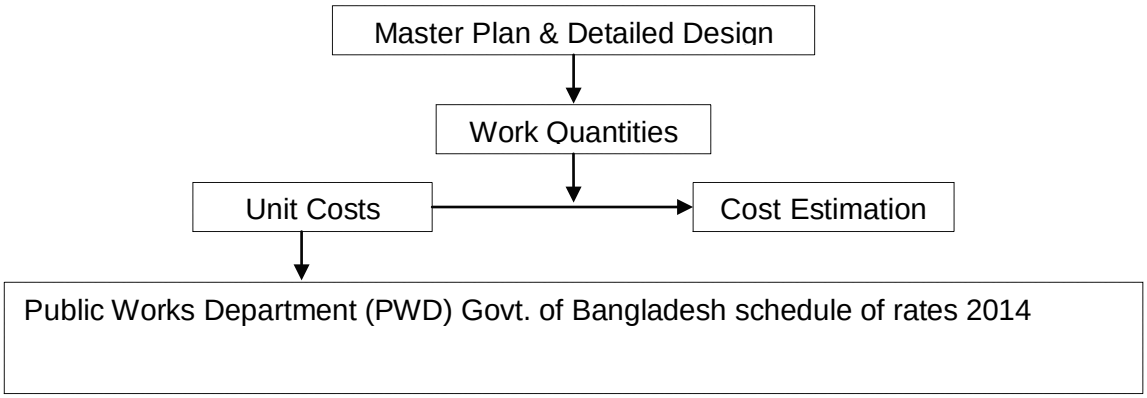


Source: Developed by the Consultants

5.8. Cost Estimation

5.8.1. Methodology of Estimation

Method of cost estimation



This estimate work has been divided into 2 (two) phases and categorized into 7 sectors as shown below:

1st Phase

No -1 : General & Site facilities which includes construction of site office, Mobilization, Layouts, Demolition, site cleaning.

No - 2 : Development cost: Contains- i. 52000 sqm area in/c sanitized sand fill area 4410 sqm up to 3.66m depth (av.) development with earth in/c mechanical compaction ii. 1508m long boundary wall, ii. 1508m long boundary wall, iii.13.50m wide road 106m long, iv. 10.5m wide road 424m long, v. 7 wide road 75m long, vi. 1.50 wide Pedestrian walk way 1500m long, vii. 3m wide Pedestrian walk way 700m long, viii. Landscaping-52000 sqm a. Tree (plantation, b. Dust bin b. Grass plantation d. Hard landscaping, ix. Garbage Bin-2 nos x. Natural pond modification and slope preparation-1518 sqm x. Canal Slope Protection

No -3 : Building and Other Infrastructure: Contains - Port Facilities: i. Administrative Building (2 storied)-2397.70 sqm, ii. Ware House-2792 sqm-1no, iii. Transshipment yard shed (1 No)-1400 sqm iv. India truck terminal-6958 sqm, Service Area: . Barrak (Border) 2 storied-720 sqm ii. Guest House-2 storied, Building (2 storied)-720 sqm, iii. Pump House and sub station Building-470 sqm. iv. Dormitory-2 storied-720 sqm, iv. Truck washing area with water supply line -150sqm, v. Sand flirtation with equity tank-1130 sqm vi. Spill basin-4 nos vii. Sanitize sand fill-4410 sqm v. Store building-470 sqm

No - 4 : Basic Services: Contains- i.52000 sqm area lighting, ii. 1508m long boundary wall lighting, iii. 605m road lighting, iv. 2200m pedestrian walkway lighting, v. Substation equipment-1600 KVA-1 no, vi. diesel generator-650 KVA-1 no, vii. diesel generator-110 KVA-1 no for server, i. UG water reservoir-100 cum capacity, ii. External drainage-1400m iii. Deep tube well (150mm dia 230m long)-1 no

No - 5 : Equipments and Plants: Contains - Weighing Bridge - 100 metric ton capacity 2 nos, IT Solution - Networking & Cabling, Server, Internet Uplink, Port & Freight Management - Port Management S/W & H/W, Maintenance.

No - 6 : Safety & Security: Contains - a. CCTV System b. Intruder Alarm System c. Car parking d. Access Control System e. Physical Security f. PA System g. Building Management System ii. Fire Fighting a. Fire Detection System b. Fire Protection System.

No - 7 : Environmental Mitigation Plan: Contains - Environmental monitoring and management plant works.

2nd Phase

No -1 : General & Site facilities which includes construction of site office, Mobilization, Layouts, Demolition, site cleaning.

No - 2 : Development cost: Contains- i. 33058 sqm area development with 3.66m depth (av), ii.1000m long boundary wall iii. 13.50m wide road 90m, iv. 10.5m wide 350m long v. , 7 wide road 50m long, vi. 1.50 wide Pedestrian walk way 700m long, vii. 3m wide Pedestrian walk way 400m long, viii. Landscaping-33058 sqm a. Tree (plantation, b. Dust bin b. Grass plantation d. Hard landscaping viii) Existing road widening (Land port area) 9.49m to 16.06m-490m long ix)New bridge construction 12 wide and 42 m long x) Canal re-excavation, protection and diversion

No - 3 : Building and Other Infrastructure: Contains - i. Transshipment yard shed (1 No)-1400 sqm, ii. Inspection Building-304 sqm, iii. open tack yard in/c drainage works-6000 sqm iv. Bangladesh Truck terminal -8386 sqm, v. Labour shed-3 nos- 570 sqm,

No - 4 : Basic Services: Contains- i. 33058sqm area lighting, ii. 1000m long boundary wall lighting iii.400m road lighting iv. 1100m pedestrian walkway lighting v. Substation equipment-1600 KVA-1 no, vi. Solar power 25000W.

No - 5 : Equipments and Plants: Contains - i. septic tank with sock well ii. External drainage-1400m ii. Deep tube well (150mm dia 230m long)-1 no Weighing Bridge - 100 metric ton capacity 2 nos

No - 6 : Safety & Security: Contains - Cabling

No - 7 : Environmental Mitigation Plan: Contains - Environmental monitoring and management plant works.

Basis of Considerations

1. Quantity:

The quantity has been measured from detailed drawing design set as per common practice of Bangladesh and sequenced as per Public Works Department (PWD) Schedule of Rates 2014 of Bangladesh Government.

2. Building Materials:

For civil Construction, local concrete, local cement and local high strength re-bar has been considered. For metal works locally available best quality pre-engineered mild steel has been considered for roofing works. Most of the materials and finishes comply with local BNBC (Bangladesh National Building Code) standard. For floors, glazing etc. finishes are constructed with locally available items like tiles, gypsum board, glass.

3. Prices:

Building items and other civil Items: Unit prices are calculated considering standard unit cost provided by Public Works Department (PWD) of Bangladesh Government, field surveyed by the study team and incorporated in the cost estimate (Present Market Price is evaluated from the Local vendors price and some are collected from manufacturers. The prices of the imported items like aluminum glazing, lighting has been considered specially after corresponding with foreign manufacturer.

MEP items: AC, plumbing works, firefighting conducting works are considered local manufacturing and installation. Accordingly for all local items the price has been taken from present market rate after studying the various tender documents for last 1 year. For imported AC equipment, toilet fixture, firefighting equipment, some specific brands Hitachi / Daikin / Media, Toto Duravit, Honey well, Eaton has been recommended and the price has been collected from the manufacturers. Cable and piping are from local market. Cable pricing has been provided from local ISO 901certified manufacturers. For Locally available imported items like switch, socket, circuit breaker are taken from local importer of good brands such as Eaton (Moeller), Legrand, Schneider etc. For Special items like switch gear has been provided after corresponding with foreign manufacturer. All light fixtures are from branded company and imported. Price has been collected from the recommended foreign manufacturer.

Software & IT: Price has been taken from various importers and also vendors.

Furniture: Prices has been taken from various importers and also vendors

5.8.2. Cost Summary

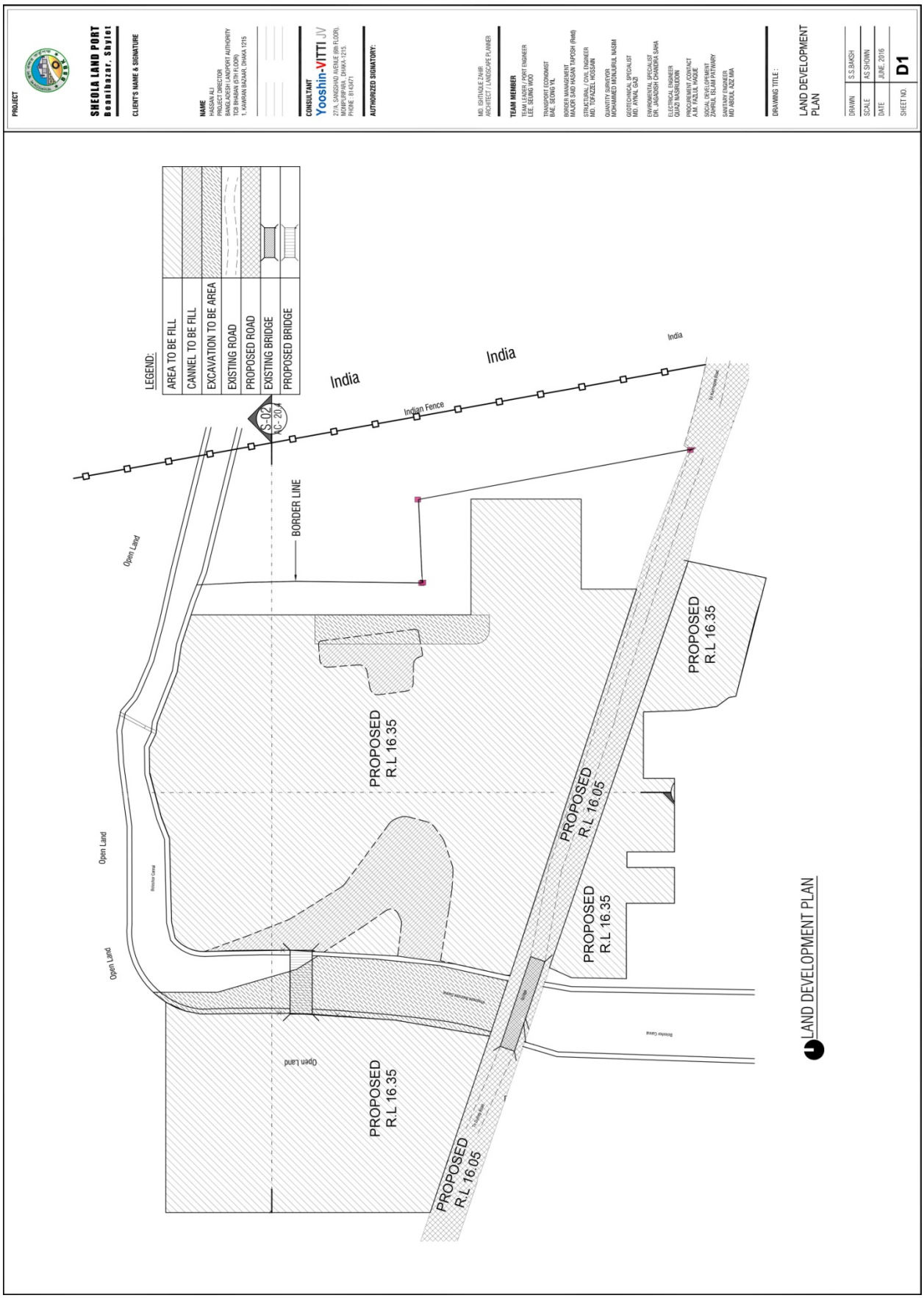
Improvement Costs for Sheola Land Port

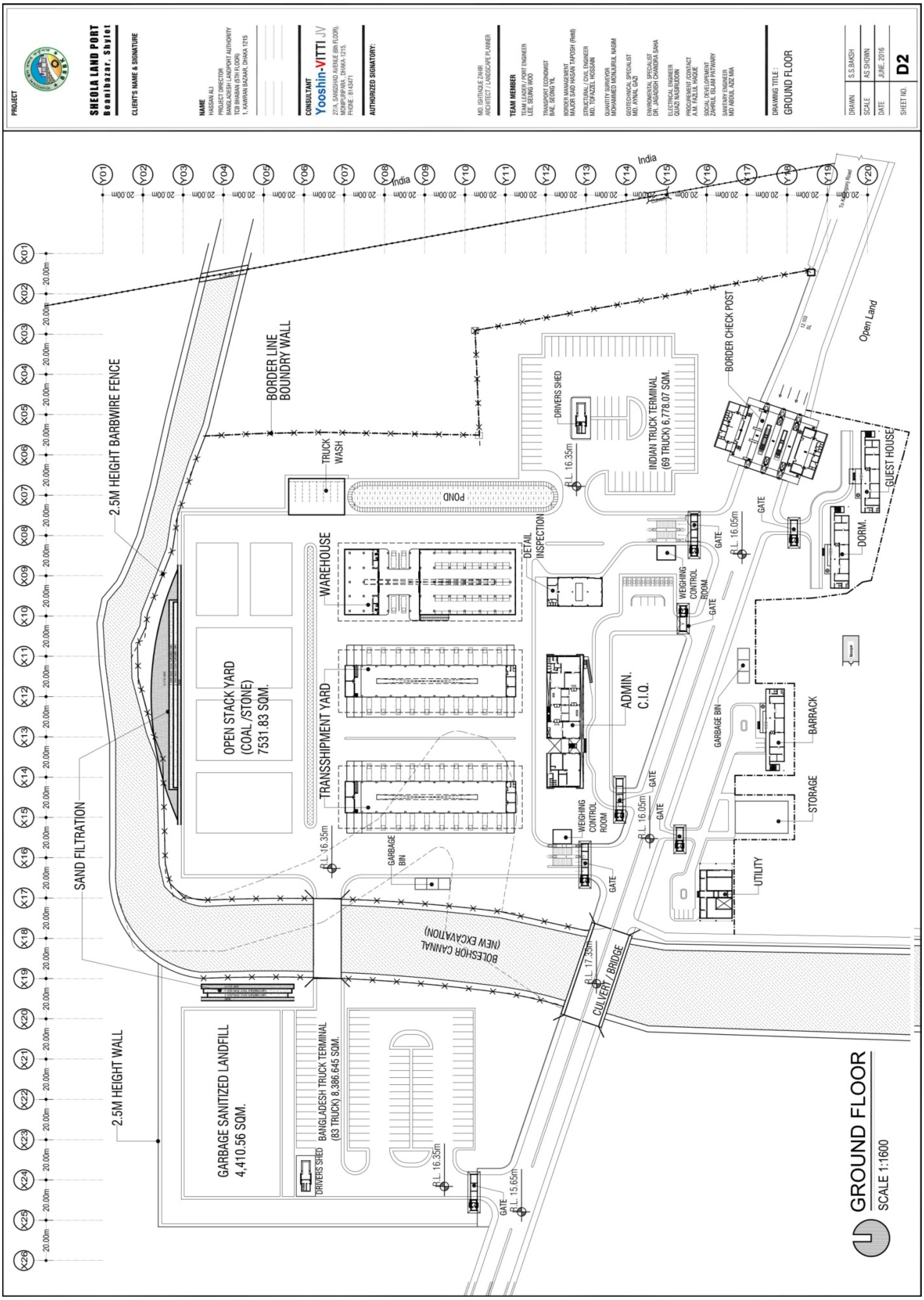
No.	Description	Total Cost		1st Phase cost		2nd Phase cost		Percentage	
		(1,000Tk)	(1,000$)	(1,000Tk)	(1,000$)	(1,000Tk)	(1,000$)	Phase-1	Phase-2
1	**Consultancy Services Cost**	**30,000**	**381**	**21,100**	**255**	**9,900**	**126**	67%	33%
2	**Land Cost**	**275,808**	**3,500**	**275,808**	**3,500**	**-**	**-**	100%	0%
	Land Acquisition	275,808	3,500	275,808	3,500	-	-		
3	**Development Cost**	**649,512**	**8,243**	**272,795**	**3,462**	**376,717**	**4,781**	42%	58%
4	**Building & Infrastructure**	**1,228,610**	**15,591**	**801,268**	**10,168**	**427,342**	**5,423**	65%	35%
	Port Facilities	1,042,297	13,227	614,955	7,804	427,342	5,423	59%	41%
	Service Area	186,313	2,364	186,313	2,364	-	-	100%	0%
5	**Basic Service Cost**	**165,109**	**2,095**	**111,585**	**1,416**	**53,524**	**679**	68%	32%
	External Electrification	147,885	1,877	100,562	1,276	47,323	601	68%	32%
	Ext. Water Supply/Sanitation	17,224	219	11,023	140	6,201	79	64%	36%
6	**Equipments and Plants**	**220,110**	**2,793**	**186,615**	**2368**	**33,495**	**425**	85%	15%
	Weighing Bridge (2 nos.)	60,610	769	30,305	385	30,305	385	50%	50%
	IT Solution (Networking, etc.)	55,000	698	53,900	684	1,100	14	98%	2%
	Port&freight management	104,500	1,326	102,410	1,300	2,090	27	98%	2%
7	**Safety & Security**	**182,119**	**2,311**	**178,476**	**2,265**	**3,642**	**46**	98%	20%
8	**Social impact mitigation cost**	**139,984**	**1,776**	**139,984**	**1,776**	-	**-**	100%	0%
9	**Environmental impact mitigation cost**	**15,865**	**201**	**6,346**	**81**	**9,519**	**121**	40%	60%
	Grand Total	**2,907,116**	**36,892**	**1,992,978**	**25,292**	**914,139**	**11,601**	69%	31%

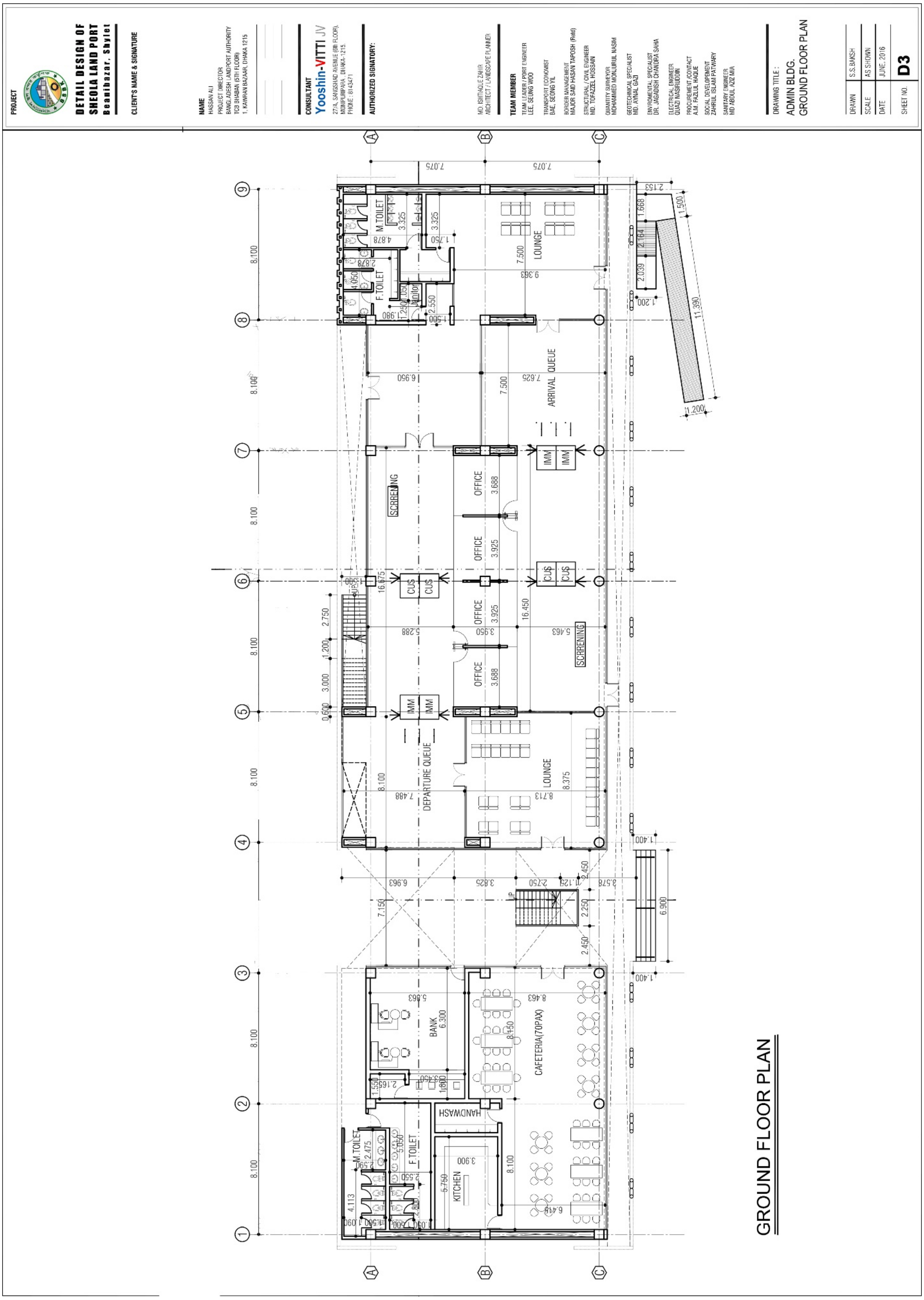
5.8.3. *Note*: 1 USD = 78.8 Taka

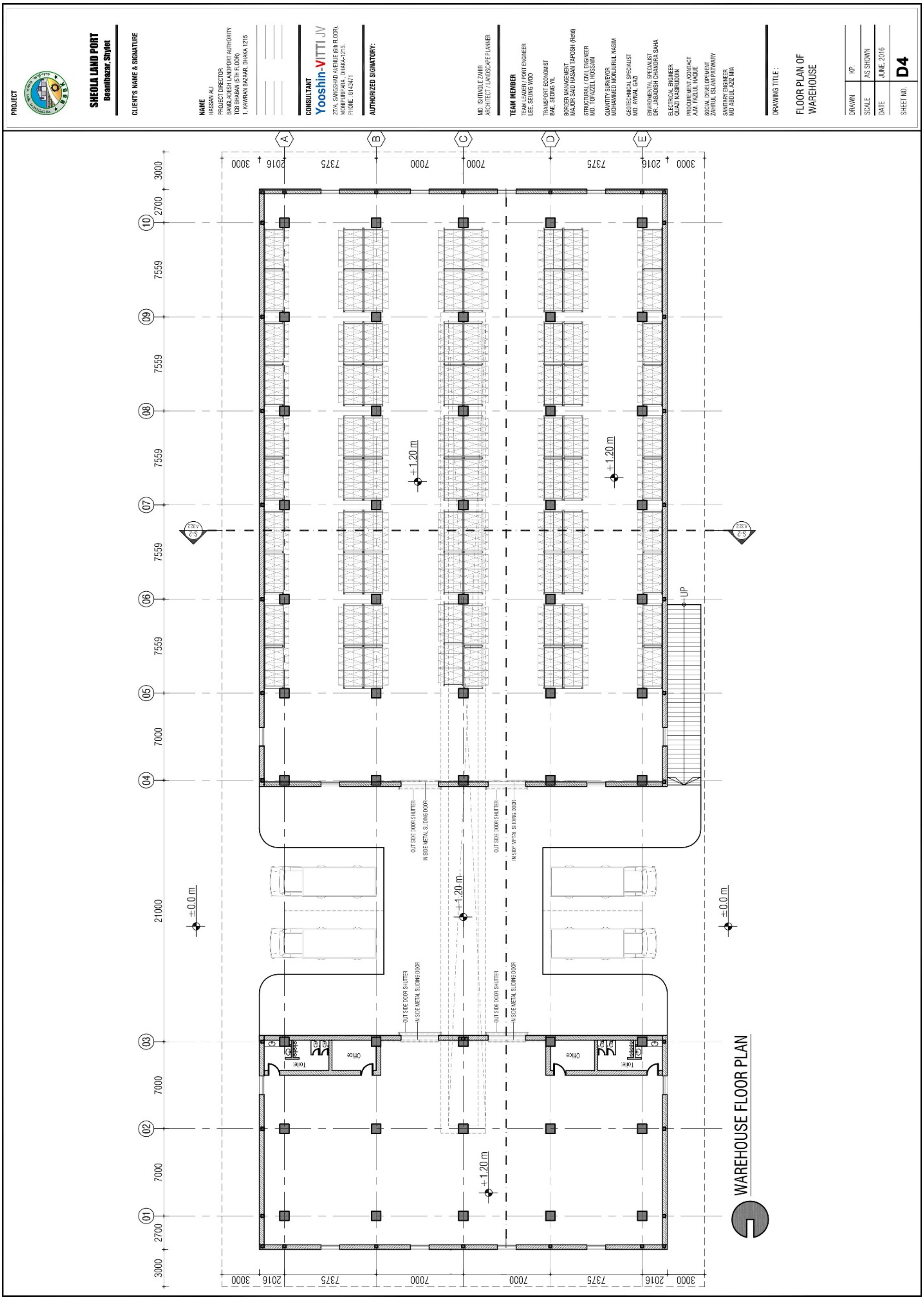
Appendix 1: Engineering drawing for Sheola Land Port

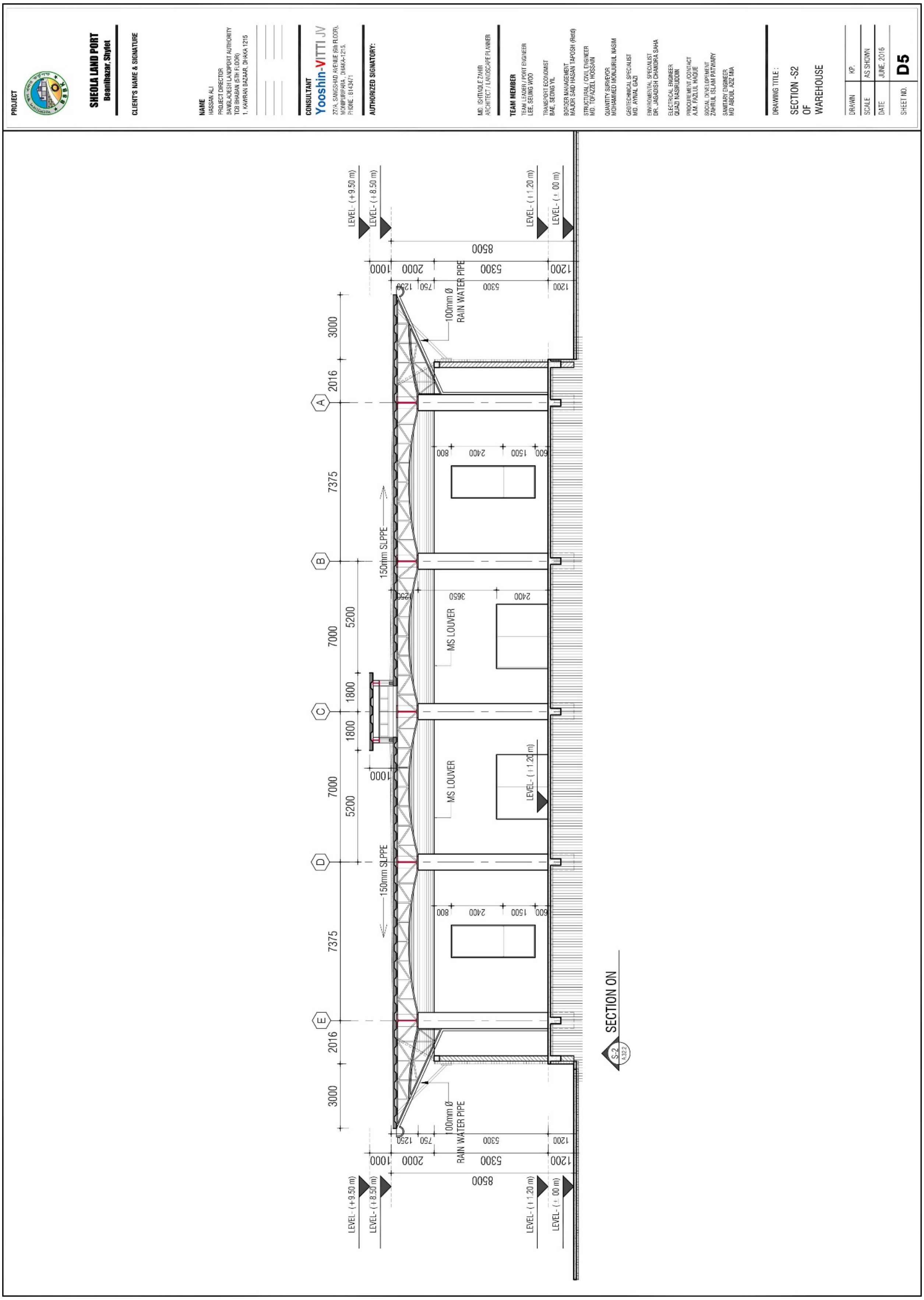
Drawing Number	Title
D1	Land Development
D2	The Master Plan of Sheola Land port with proposed Structures And Elements
D3	Administrative Ground Floor
D4-D5	Proposed Warehouse Plan and Section
D6-D7	Transshipment Yard Plan and Section
D8	Indian Truck Terminal
D9	Pavement Design
D10	Sanitary and Wastewater Management

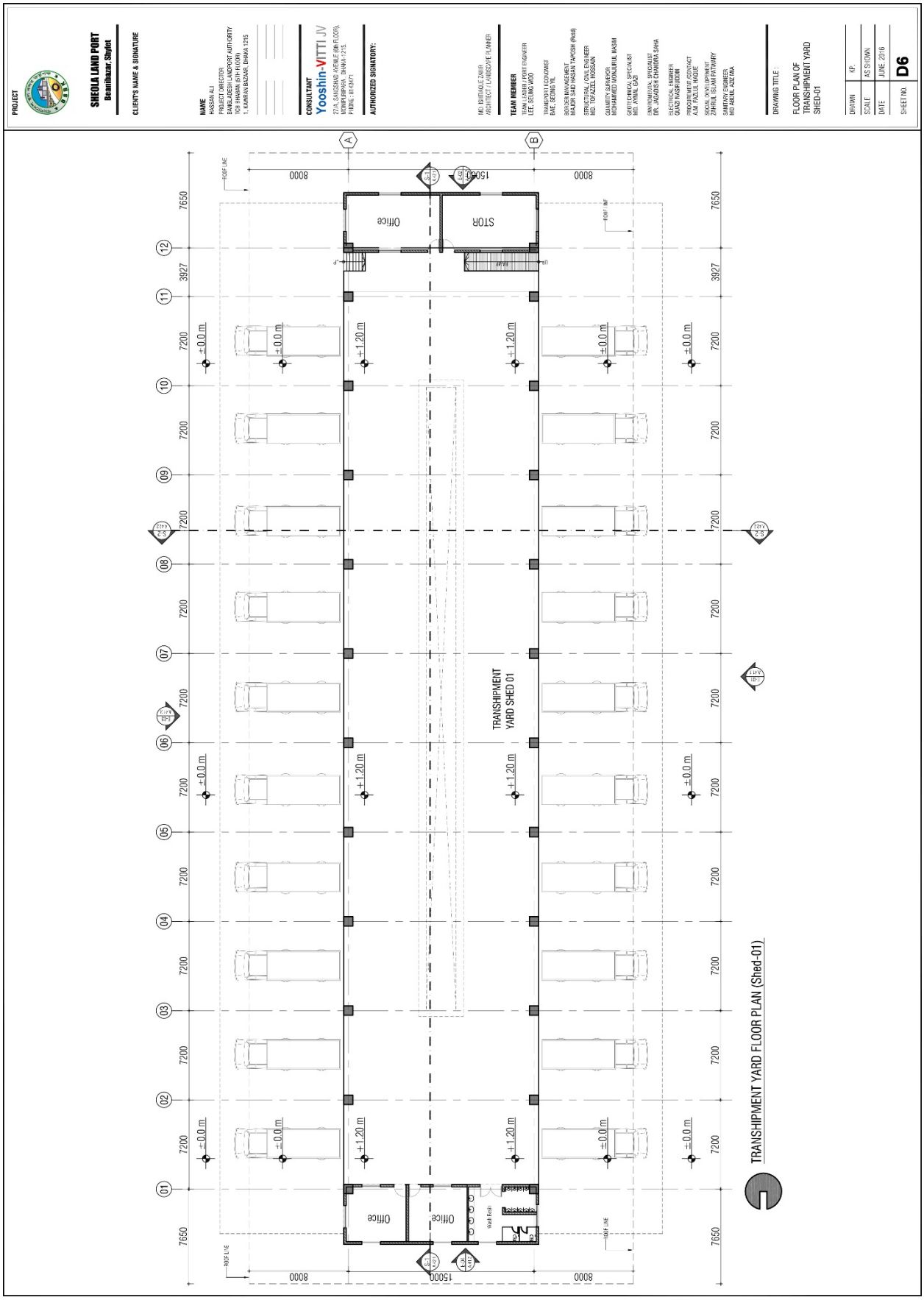

PROJECT
SHEOLA LAND PORT
Beanibazar, Sylhet
CLIENT'S NAME & SIGNATURE
NAME
HASSAN ALI
PROJECT DIRECTOR
BANGLADESH LAND PORT AUTHORITY
TCB BHABAN (5TH FLOOR)
1, KAWRAN BAZAAR, DHAKA 1215
CONSULTANT
Yooshin-VITTI JV
27/A, SANGSHAD AVENUE (6th FLOOR),
MOHAMMADPUR, DHAKA-1215.
PHONE : 8141477
AUTHORIZED SIGNATORY:
MD. ISHTIAQUE ZAHIR
ARCHITECT / LANDSCAPE PLANNER
TEAM MEMBER
TEAM LEADER / PORT ENGINEER
LEE, SEUNG WOO
TRANSPORT ECONOMIST
BAE, SEONG YIL
BORDER MANAGEMENT
MAJOR SAID HASAN TAPOSH (Rtd)
STRUCTURAL / CIVIL ENGINEER
MD. TOFAZEL HOSSAIN
QUANTITY SURVEYOR
MOHAMMED MONJURUL NASIM
GEOTECHNICAL SPECIALIST
MD. AYNAL GAZI
ENVIRONMENTAL SPECIALIST
DR. JAGADISH CHANDRA SAHA
ELECTRICAL ENGINEER
QUAZI NASIRUDDIN
PROCUREMENT /CONTRACT
A.M. FAZLUL HAQUE
SOCIAL DEVELOPMENT
ZAHIRUL ISLAM PATHARY
SANITARY ENGINEER
MD ABDUL AZIZ KHA
DRAWING TITLE :
LAND DEVELOPMENT PLAN
DRAWN S.S.BAKSH
SCALE AS SHOWN
DATE JUNE, 2016
SHEET NO. D1
LEGEND:
AREA TO BE FILL
CANNEL TO BE FILL
EXCAVATION TO BE AREA
EXISTING ROAD
PROPOSED ROAD
EXISTING BRIDGE
PROPOSED BRIDGE
India
India
India
Indian Fence
S-02
KC- 20+
BORDER LINE
Open Land
Open Land
Open Land
Open Land
PROPOSED R.L 16.35
PROPOSED R.L 16.35
PROPOSED R.L 16.35
PROPOSED R.L 16.35
PROPOSED R.L 16.05
PROPOSED R.L 16.05
LAND DEVELOPMENT PLAN

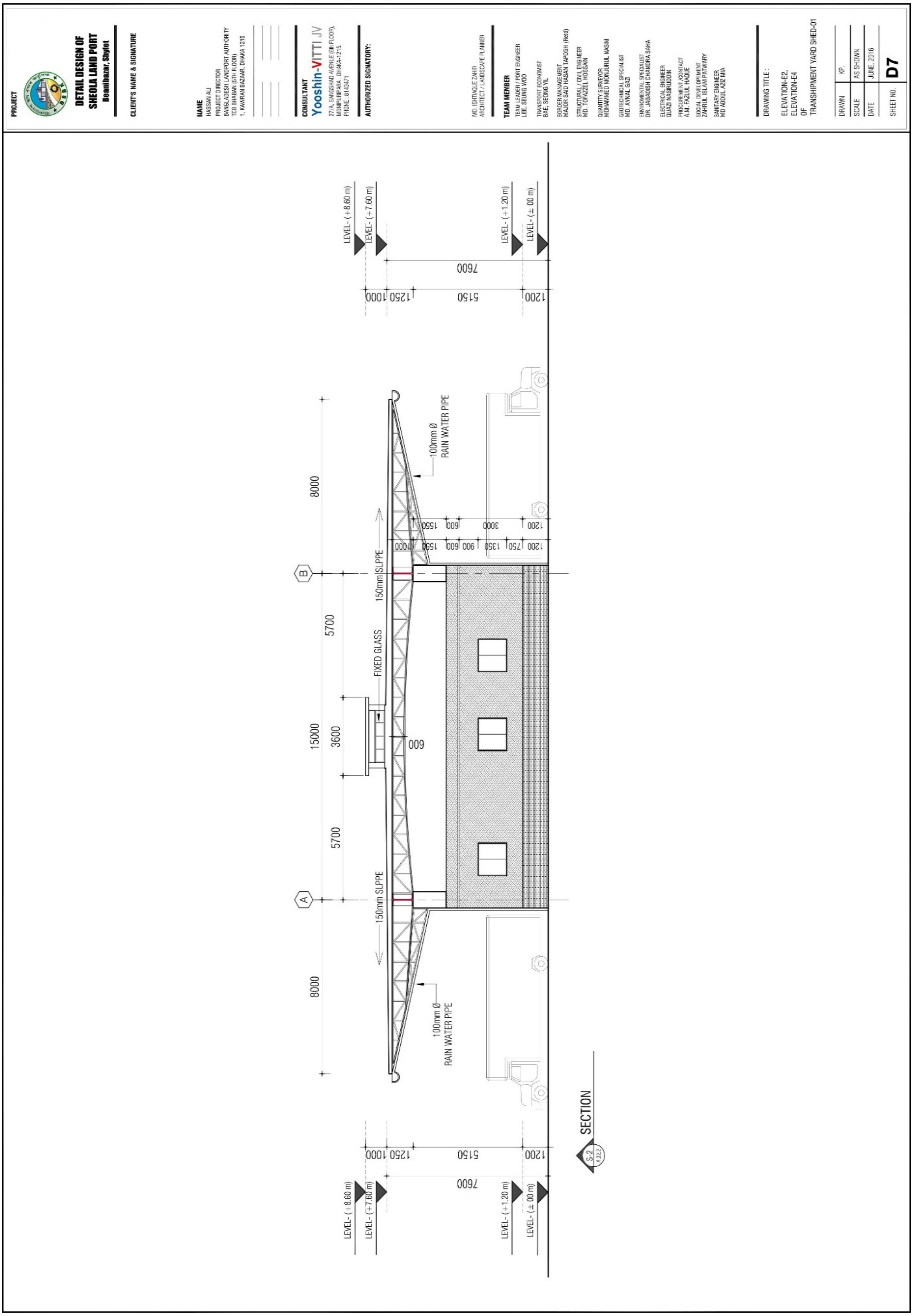

PROJECT
SHEOLA LAND PORT
Beanibazar, Shylet
CLIENT'S NAME & SIGNATURE
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
GROUND FLOOR
DRAWN S.S.BAKSH
SCALE AS SHOWN
DATE JUNE, 2016
SHEET NO. D2
2.5M HEIGHT BARBWIRE FENCE
BORDER LINE BOUNDRY WALL
TRUCK WASH
POND
INDIAN TRUCK TERMINAL (69 TRUCK) 6,778.07 SQM.
DRIVERS SHED
BORDER CHECK POST
Open Land
India
GUEST HOUSE
DORM.
WAREHOUSE
DETAIL INSPECTION
WEIGHING CONTROL ROOM
GATE
ADMIN. C.I.Q.
OPEN STACK YARD (COAL /STONE) 7531.83 SQM.
TRANSSHIPMENT YARD
SAND FILTRATION
GARBAGE BIN
BARRACK
STORAGE
UTILITY
BOLESHOR CANNAL (NEW EXCAVATION)
CULVERT / BRIDGE
2.5M HEIGHT WALL
GARBAGE SANITIZED LANDFILL 4,410.56 SQM.
BANGLADESH TRUCK TERMINAL (83 TRUCK) 8,386.645 SQM.
R.L. 16.35m
R.L. 16.05m
R.L. 17.35m
R.L. 15.65m
GROUND FLOOR
SCALE 1:1600

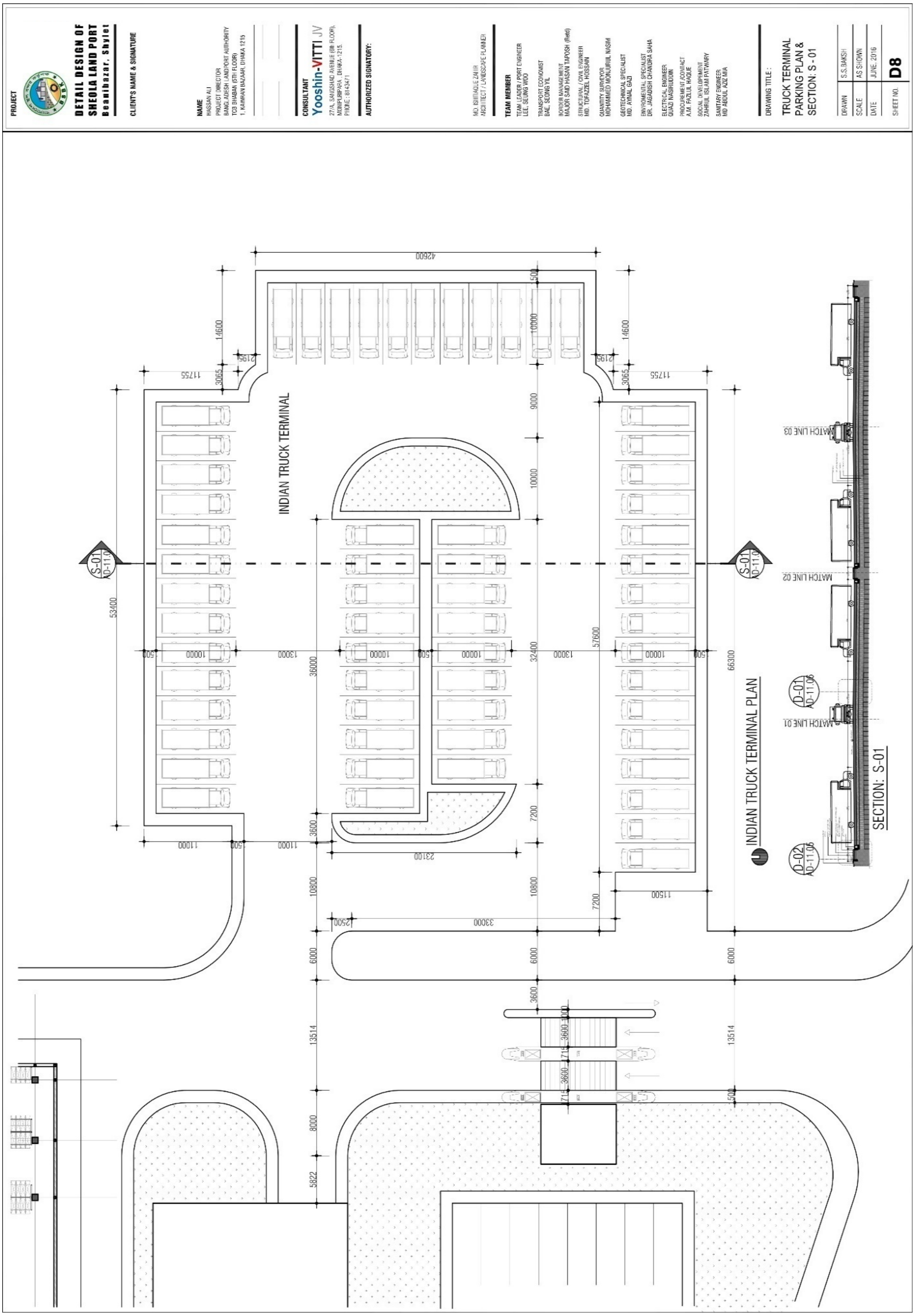

DETAIL DESIGN OF SHEOLA LAND PORT
Beanibazar, Sylhet
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
ADMIN BLDG.
GROUND FLOOR PLAN
DRAWN S.S.BAKSH
SCALE AS SHOWN
DATE JUNE, 2016
SHEET NO. D3
M.TOILET
F.TOILET
LOUNGE
ARRIVAL QUEUE
SCREENING
OFFICE
CUS
IMM
DEPARTURE QUEUE
BANK
CAFETERIA(70PAX)
HANDWASH
KITCHEN
GROUND FLOOR PLAN

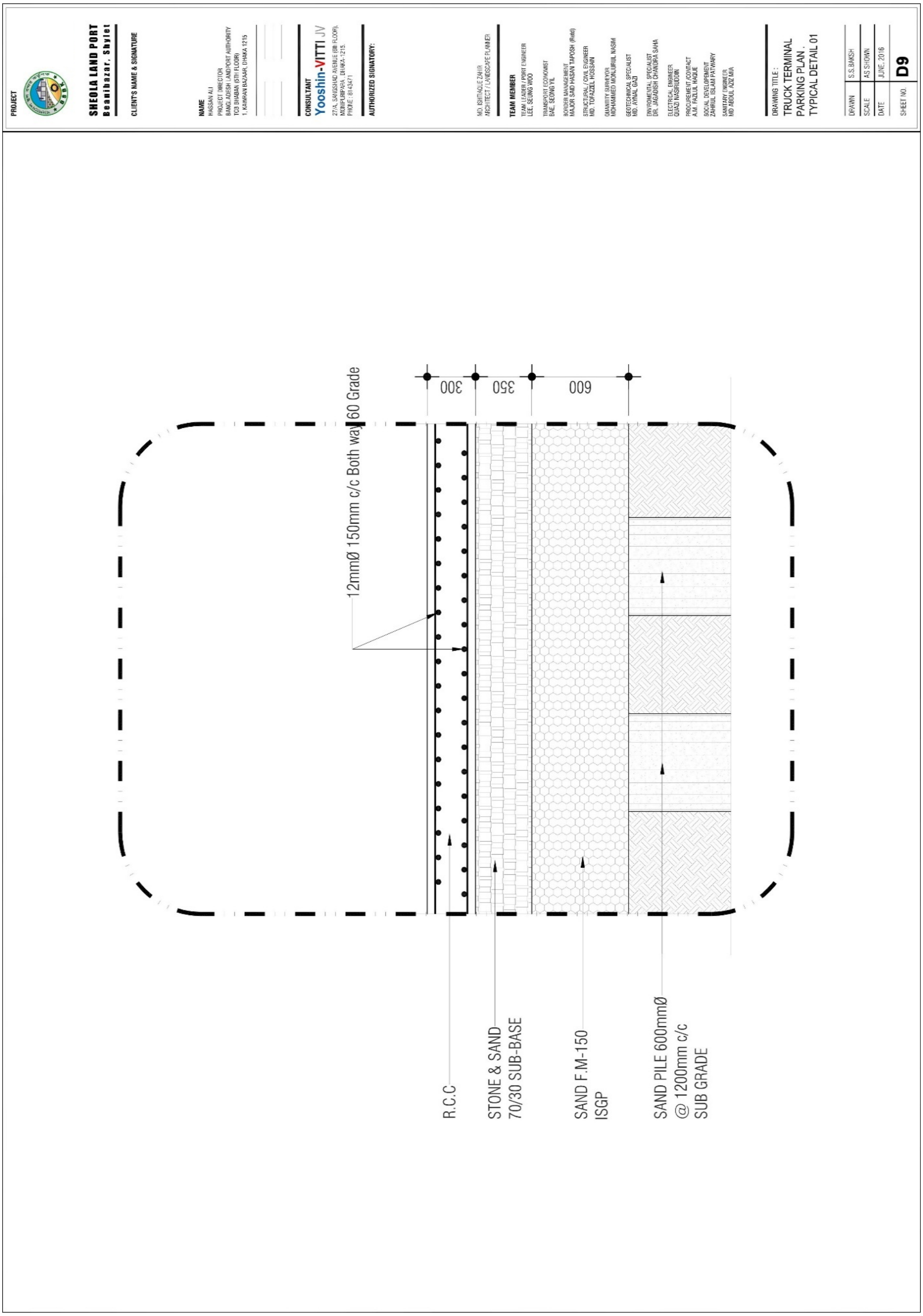

PROJECT
SHEOLA LAND PORT
Beanibazar, Shylet
CLIENT'S NAME & SIGNATURE
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
FLOOR PLAN OF WAREHOUSE
AS SHOWN
JUNE, 2016
D4
WAREHOUSE FLOOR PLAN
±0.0 m
+1.20 m
UP
Toilet
Office

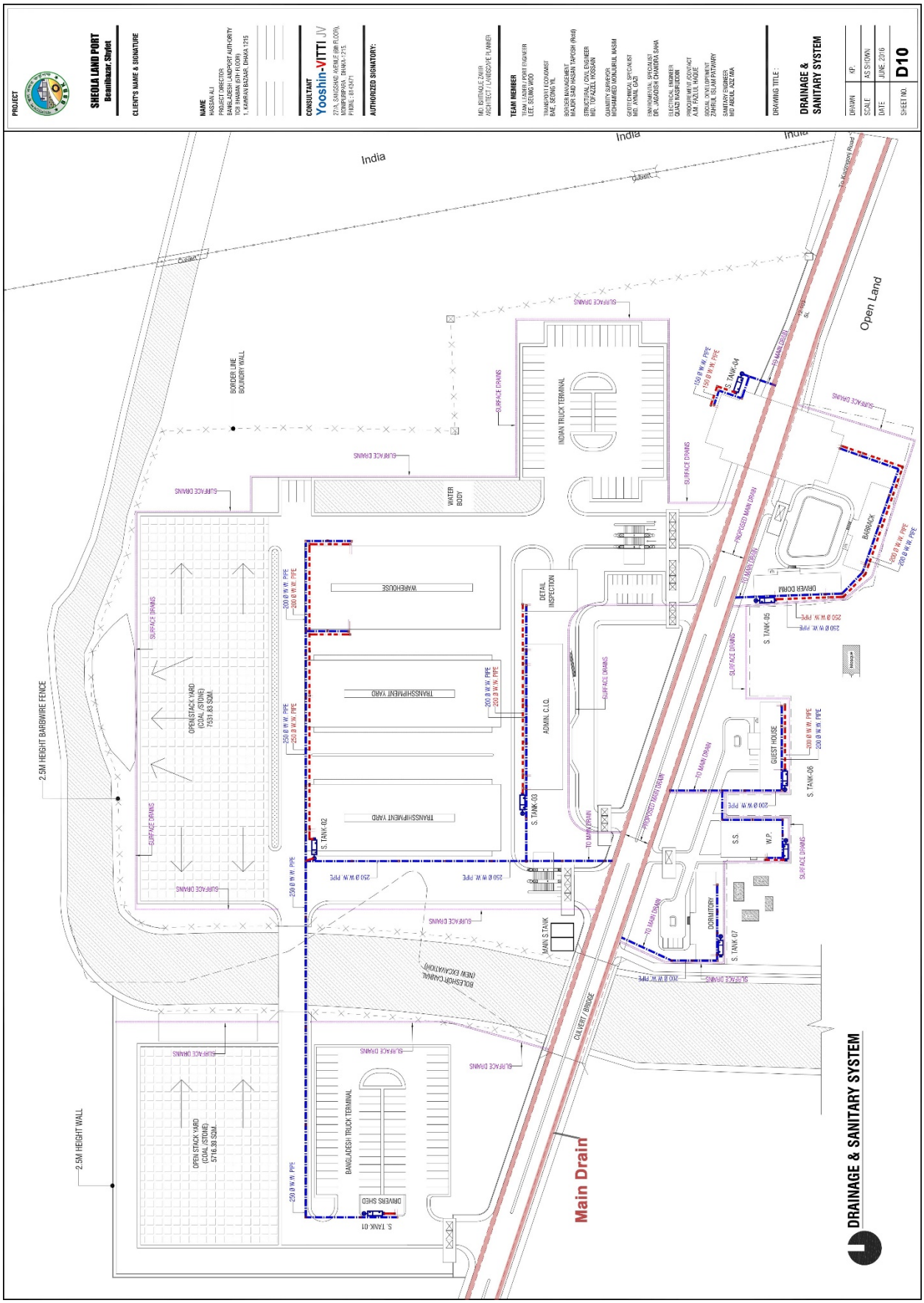

PROJECT
SHEOLA LAND PORT
Beanibazar, Shylet
CLIENT'S NAME & SIGNATURE
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
SECTION -S2
OF
WAREHOUSE
DRAWN
SCALE
AS SHOWN
DATE
JUNE, 2016
SHEET NO.
D5
100mm Ø RAIN WATER PIPE
150mm SLPPE
MS LOUVER
SECTION ON


PROJECT
SHEOLA LAND PORT
Beanibazar, Sylhet
CLIENT'S NAME & SIGNATURE
NAME
HASSAN ALI
PROJECT DIRECTOR
BANGLADESH LANDPORT AUTHORITY
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
FLOOR PLAN OF TRANSHIPMENT YARD SHED-01
DRAWN
KP
SCALE
AS SHOWN
DATE
JUNE, 2016
SHEET NO.
D6
TRANSHIPMENT YARD SHED 01
Office
STOR
Office
Office
Wash Basin
TRANSHIPMENT YARD FLOOR PLAN (Shed-01)


PROJECT
DETAIL DESIGN OF
SHEOLA LAND PORT
Beanibazar, Sylhet
CLIENT'S NAME & SIGNATURE
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
ELEVATION-E2,
ELEVATION-E4
OF
TRANSHIPMENT YARD SHED-01
SCALE AS SHOWN
DATE JUNE, 2016
SHEET NO. D7
100mm Ø
RAIN WATER PIPE
150mm SLPPE
FIXED GLASS
SECTION


PROJECT
DETAIL DESIGN OF SHEOLA LAND PORT Beanibazar, Shylet
CLIENT'S NAME & SIGNATURE
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
TRUCK TERMINAL PARKING PLAN & SECTION: S - 01
DRAWN S.S.BAKSH
SCALE AS SHOWN
DATE JUNE, 2016
SHEET NO. D8
INDIAN TRUCK TERMINAL
INDIAN TRUCK TERMINAL PLAN
SECTION: S - 01
MATCH LINE 01
MATCH LINE 02
MATCH LINE 03


SHEOLA LAND PORT
CLIENT'S NAME & SIGNATURE
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
TRUCK TERMINAL
PARKING PLAN .
TYPICAL DETAIL 01
DRAWN S.S.BAKSH
SCALE AS SHOWN
DATE JUNE, 2016
SHEET NO. D9
300
350
600
12mmØ 150mm c/c Both way 60 Grade
R.C.C
STONE & SAND
70/30 SUB-BASE
SAND F.M-150
ISGP
SAND PILE 600mmØ
@ 1200mm c/c
SUB GRADE


PROJECT
SHEOLA LAND PORT
Beanibazar, Sylhet
CLIENT'S NAME & SIGNATURE
NAME
HASSAN ALI
PROJECT DIRECTOR
BANGLADESH LANDPORT AUTHORITY
CONSULTANT
Yooshin-VITTI JV
AUTHORIZED SIGNATORY:
TEAM MEMBER
DRAWING TITLE :
DRAINAGE & SANITARY SYSTEM
DRAWN
KP
SCALE
AS SHOWN
DATE
JUNE, 2016
SHEET NO.
D10
India
Culvert
Open Land
To Kulaura Road
BORDER LINE
BOUNDRY WALL
INDIAN TRUCK TERMINAL
WATER BODY
WAREHOUSE
TRANSSHIPMENT YARD
TRANSSHIPMENT YARD
DETAIL INSPECTION
ADMIN. C.I.Q.
OPEN STACK YARD (COAL /STONE) 7231.83 SQM.
2.5M HEIGHT BARBWIRE FENCE
2.5M HEIGHT WALL
OPEN STACK YARD (COAL /STONE) 5716.39 SQM.
BANGLADESH TRUCK TERMINAL
DRIVERS SHED
S. TANK 01
S. TANK-02
S. TANK-03
S. TANK-04
S. TANK-05
S. TANK-06
S. TANK-07
MAIN S.TANK
PROPOSED MAIN DRAIN
TO MAIN DRAIN
SURFACE DRAINS
BURROCK
DRIVER CORM
GUEST HOUSE
S.S.
W.P.
DORMITORY
BOUSHOR CANAL (NEW EXCAVATION)
CULVERT / BRIDGE
Main Drain
DRAINAGE & SANITARY SYSTEM

Chapter 6: Environmental Assessment

6.1 Executive Summery

6.1. Executive Summery

A. Introduction

The Bangladesh Regional Connectivity Project 1 (the Project) is the proposed Project by the Government of Bangladesh (GoB) to lower time and costs associated with trade and improve infrastructure and conditions for trade along strategically important regional transport corridors. One of the component of the Project includes investments to develop key land ports essential for trade with India and Bhutan. These include development of a new land port in Sheola, land port at Bianibazar, Sylhet. This Environmental Impact Assessment Report (EIA) presents the environmental assessment of the proposed Sheola Land Port (the Subproject). A Social Impact Assessment (SIA) and Resettlement Action Plan (RAP) have also been prepared for the Sheola Land Port and are presented in separate covers.

Geographically, Bangladesh is well located to play an important role in the South Asia region as a logistics and transit country. It can facilitate movements between several surrounding countries especially between mainland India and its North East (NE) Region states, and landlocked Nepal and Bhutan as well as overland trade flows between South Asia and Myanmar and the rest of East Asia. Thus the land ports are strategically important for bilateral trade flows and through transit traffic movements across the region. Of the various flows, the greatest potential lies in the traffic moving between Northeast India and the rest of India. According to 2009 estimates, more than 40 million tons of traffic move annually through the Siliguri Corridor (a 40 km corridor located between Nepal and India, also known as the Chicken's Neck) between Northeast India and the rest of India. In addition, about another one million tons also move between Kolkata, and Nepal and Bhutan. There is therefore potential that in addition to current bilateral flows, the Bangladesh borders could handle a significant proportion of the more than 41 million tons of traffic. These numbers reflect the current difficult long transit route and do not reflect the enormous trade volumes that could increase should a more direct transit route through Bangladesh be facilitated.

The above mentioned project activities will impact environment. The project authority intended to develop and implement the project with sustainable manner as per DoE and WB guideline.

B. Policy, Legal Administrative and Regulatory Framework

The Environmental Conservation Act (ECA, 1995) is the main legislative framework related to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. In accordance with this Act, the proposed Project will need to be cleared by DoE before commencing the project following procedures given in the Environment Conservation Rules (ECR) 1997 amended on 2010. ECR classify the projects in to various categories (Green, Orange A, Orange B and Red) for the purpose of environmental clearances. Construction of land port is not included in the classification of different industrial units or projects list in ECR.

However, considering the previous experience of BLPA on obtaining environmental clearances for other land ports and scope of works involved in those ports, it can be

expected that development of new land port or up gradation of existing land ports will also fall in to 'Orange B' category. The Project is expected to be categorized as "Orange" and hence BLPA will submit the following documents to DOE: An Initial Environmental Examination (IEE) with Environmental Management Plan (EMP).

Among the World Bank Safeguards, from an environmental perspective, the Environmental Assessment (OP/BP 4.01) is triggered. Since most of these impacts are site specific and can be mitigated with standard mitigation measures, hence the proposed project falls under category B. Environmental Impact Assessment (EIA) report prepared for Sheola land port in compliance with the WB policy. Stakeholder and Public consultation and disclosure requirements are performed duly on 7th June 16 as per the World Bank policy.

C. Project Description

Overall Project and Components

Sheola Land Customs Station (LCS) started its operation the export and import activities were conducted with the Kushiyara river route since 1948. In 1996, this Sheola LC station was transferred to the Sutarkandi under Dubagh union near border line 2km away to the South East location and started its activities as LC station depending of the road network only. But the name of this LC station remains named Sheola LC Station. Recently the number of vehicle using Sheola LC is increasing over time and the importance of the location considering, the Government has already declared the Sheola LC station as Sheola Land Port on 30.06.2015.

The proposed facilities to be built are:

- **Port facilities**: administrative building, ware houses, transshipment Sheds, open stack yards, and Bangladesh and India truck terminals;
- **Service Areas**: barrak, dormitory, restaurant, substation/generator and fuel house, and mosque;
- **Infrastructure**: fencing/boundary wall, internal road network, drains, footpath, parking, and landscaping, tree plantation along the boundary wall
- **Electrification Works**: area lighting, boundary wall lighting, footpath lighting, road lighting, substation equipment and diesel generators, and solar power;
- **Water Supply and Sanitation Works**: water supply and sanitation facilities
- **Safety and Security**: fire protection and detection, first aid facilities, CCTV system, intruder alarm system, car park management, access control system, physical security, and watch towers.

Other facilities like as toilet facilities for women, women-only waiting rooms and differently abled users, and address safety-related issues for all users. All terminals will be provided with separate women counters, waiting rooms and toilets for women passengers, and ramps for movement of differently abled people and need to be provided with drinking water facilities.

Associated Activities

Road Connectivity: The road from Sylhet to Sheola L.C Station is constructed by LGED and the road is Paved. The road is being widened that will help heavy vehicles to move easily n the road. Moreover, the road will be able to carry more freight and people. The

existing road condition is adequate for five years initially for operation of the land port, but for later stage, the improvement was required.

Power Line: For operation of the port facilities, an existing power line from Beanibazar to the proposed land port needs to be extended. The length of this power line will be 13 km. In addition to the power line, a solar power of 25 kW and two generators will be installed as a backup power source.

During construction, the site for the proposed construction will be used for establishing construction camps and material storage facilities. About 200,000 cubic meters of the borrow material would be required for filling of the land above the flood levels. The borrow material will be extracted from the abandon fallow land and pond of the area within 10 km.

Environmental Setting

The proposed Sheola land port will be developed within and around the existing Sheola land custom station at Sutarkandi. Sheola Land Customs (LC) station is located 13 km from Beanibazar Upazila Parishad and 45km from Sylhet district Headquarter. The project area lies between latitude 24°52'22.33" (N) and longitude 92°14'48.84" (E).

The North and West side of the project is flood plain and vacant land, East side of the project is Sutarkandi, India and South side of the project Sutarkandi (Bangladesh side). The site is flooded with rain water during rainy season and during dry season it is used for parking of trucks and temporary storage area for the imported coal. A narrow rainwater canal is located adjacent north-west side to the port site. The Kushiyara River is located about 3 km west of the site and an inland drainage basin named Muriha Haour is located 1.5 km South of Sheola land port. The present annual amount of exports at this station is 34803 tons and imports is 99324 tons.

D. Initial Screening and Scoping of Environmental Impacts

The Sheola land port is to be established around the existing port areas currently is being used by land customs station. The land port will be located in a flood plain land, which is a barren land during dry season and is being used for parking of vehicles, and some residential areas in the South side of the project. A summary of the potential impacts associated with the proposed land port development are given below along with potential mitigation measures:

- Some part of the proposed site is located in a flood plain land named Dubagh beel and hence filled with water during rainy season. An inland water basin, Muriha Haour, is located1.5 km South of Sheola land port. Generally, flood plains are fish spawning areas and haors are the fish habitats. Care should be taken to avoid waste water runoff from proposed port facilities to adjacent Dubagh beel and Muriha Haour.
- Fill material for land port land development will be collected from the abandon and unused land, silted pond and non-agricultural land near by the area. During carrying of earth truck should be cover with triple and dust suppression through water sprays should be done.
- The major import item is coal about 97% of total import per year. Loading and unloading operation, store on the open stack yard and management of coal dust

and coal wash water during rainy season should be control through filter and this should be considered during design of the facilities.

- Few residences are located near the South side of the proposed port site. Hence noise would be a major concern during the operation phase and dust will be less concern due to general wind flow from South to North. Major part of the port will be constructed in North side. Adequate noise control measures such as developing buffer zones and tree plantation around the port facilities should be considered during the design of the port. Dust control measures, cover storage areas, sweeping and vacuum collecting equipment should be considered during design of the facilities.
- No waste collection system, rotten and rejected goods and disposal facilities are not available. Waste collection and location of disposal facilities should be considered during design.
- Separate facilities like toilets and waiting room in custom office and immigration counter for women traveller and traders should be design in the port facilities. Ramp facilities should be provided for disable people.
- A rainwater drain (canal) passes through the North side of project site, which carries rain water during monsoon and has a limited catchment area. The canal alignment is not straight, and has a mender and therefore canal erosion is noticed along the banks. Bank protection measures are required to control the erosion. The port site developed above the 100-year flood level data and also considered the climate change impacts.

E. Environmental Assessment

Environmental assessment (EA) of the Project has been carried out using Environmental Management Framework (EMF) provided by the World Bank Consultant. In the studies ensured all relevant environmental issues are mainstreamed into the design and implementation of the proposed project, ensure compliance of the Project with national and World Bank requirements, and conducting EIA for the Sheola Land Port project.

The following environmental issues were considered baseline survey of during EIA study.

i. Source of land fill material and land development
ii. Hydrology of the project area
iii. Biological species study (Flora and fauna, endangered species)
iv. Climatic condition (Temperature, rainfall, humidity)
v. Environmental quality (Air, water, noise)
vi. Socio economic condition (Population, demography, archeology, economy and culture, indigenous people, water supply and sanitation and affected person)

Mitigation measure developed as per impact identified.

F. Alternative Analysis

There are three potential options for multimodal transport, one through Kushiyara river, which is located about 3 km north of the current Sheola LCS, and the second one is

through railway line, which is located about 8 km south of the Sheola LCS, and third option is the Sheola LCS itself. Before partition of India in 1947, both the Kushiyara River and railway line were used for transport of passengers and good. The current Sheola LCS location has been considered for further development, since India has already built huge land port infrastructure on the other side of the border.

Three options have been considered for finalizing the location of the port site. Analyzing all the options, Traditional design has been selected as it will give most of the benefit. The pros and cons of options that are analyzed for Traditional, Co-located or Juxtaposed, Staggered are given detail EIA report.

Two layouts have been considered for the site development. The layout 1 is spread over 43 acres of land and includes facilities for private warehouses and traders. The second layout is the selected option spread over in 22.1 acres of land and will not cover any facilities for the private traders. The layout for option 2, which has considered for the land port project design.

Considering all the mentioned factors existing land custom site at Sutarkandi is more suitable and sustainable for Sheola Land Port Development and detail of environmental study was conducted on the existing land custom site for Land port development.

G. Stakeholder and Public Consultation

The stakeholder and public consultation program is an essential part of the environmental assessment process and has been undertaken both formally and informally throughout the study to ensure that the knowledge, experience and views of stakeholders and the general public are taken into account during the study. The information shared and recorded where relevant, been applied to justify design, construction methodology and timing changes, in order to reduce predicted negative effects. This approach satisfies statutory consultation requirements of the DoE.

The primary methods followed in the consultation process are:

- Individual level consultation/discussion;
- Key Informant Interview
- Focus group discussion;
- Free prior informed Public Consultation

In April 2016, meet Sheola Union Parishad Chairman requesting them to assist the Consultant with the organization of public meetings and FGD at a number of locations in the Project area. The Union Parishad Chairman were also asked to actively participate in, and in most cases chair the consultations.

Free prior informed public consultation meetings were held at Dubag union parisad bhaban during project preparation and to share the draft EIA report. A public consultation meeting was held on 7th May 2016 with the local communities. Notices about the consultation meeting were circulated to the local communities through leaflets one week in advance of the meeting. Posters were also displayed at public places (at Union Parishad Bhavan, market). All types of stakeholder Upazila Chairman, UP chairman, Business leader, local elites, Imam of Mosque, Hotel owner, truck driver, C&F agent including project affected person (PAPs) were present and participated in the exchange

view session. Additionally, meetings were also held with local government officials and customs officials. They are happy to know the implementation of the Sheola land port project. They want proper compensation for their land acquisition, loss of structure and livelihood and proper environmental mitigation measure during pre-construction, construction and operation period. They will cooperation in the project since their socio economic condition will improve after implementation of the project.

A national consultation on draft environmental and social assessment study was held on 10th August 16 at BLPA auditorium in Dhaka. Photographs of these consultations are given at the end of report for local and national consultations, respectively. During these consultations, leaflets on key environmental and social issues were distributed to the participants (these were prepared in local language in Bangla) and big size posters were also displayed at the venue. Power point presentations were made by the environmental and social experts. Participants were encouraged to ask questions on the social and environmental issues.

Before the commencement of the EMP meetings the following materials were disseminated and invite all stakeholder and affected person, fostering in important plan one day before the consultation meeting, with the aim of developing positive and constructive relationships with stakeholders and improving their knowledge about the project and therefore enhance their ability to ask informed questions and to provide useful input and advice.

These materials were:

- Summary of the mitigations proposed during Project Disclosure meetings
- Written and visual information, including leaflet/brochure in Bangla, maps, drawings and diagrams, detailing the Project activities; and
- Identification of environmental impact including land fill
- The draft EMP
- Grievance Redress Mechanism (GRM)

General findings of the public consultation: Some issues, as described by those who attended in the consultation are summarized below:

Sands/earth used for filling the lowland, Acquisition of low land, small part of agricultural land and structure, Socio-Economic Benefit, Job facility and Communication, Accident, Noise pollution, Air pollution, Traffic congestion, Contribution of improvement of traffic communication system

H. Environmental Management and Monitoring Plan

The basic objective of the EMP is to manage adverse impacts of proposed project interventions in a way that minimizes the adverse impact on the environment and people at the subproject sties. The specific objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures discussed earlier in the document.
- Maximize potential project benefits and control negative impacts;

- Draw responsibilities for BLPA, contractors, consultants, and other members of the project team for the environmental and social management of the Project;
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures,
- Ensure the effectiveness of the mitigation measures;
- Maintain essential ecological process, preserving biodiversity and where possible restoring degraded natural resources; and
- Assess environmental training requirements for different stakeholders at various levels.

The EMP will be managed through a number of tasks and activities and site specific management plans. One purpose of the EMP is to record the procedure and methodology for management of mitigation identified for each negative impacts of the subproject. The management will clearly delineate the responsibility of various participants and stakeholders involved in planning, implementation and operation of the subproject.

Proposed monitoring plan for construction (Land filling and development), awareness building, accident, air pollution, noise pollution, water and waste water pollution and an operation (accident, air pollution, noise pollution) period to be carried during implementation of the project to ensure contractors compliance with the mitigation measures along with the monitoring indicators and frequency. BLPA will be responsible for supervision of implementation of the plan.

I. Institutional Arrangements

The Project implementation will be led by the Project Implementation Unit (PIU) that will be established within BLPA. The PIU will be responsible for procurement of consultants for carrying out the EIA and engineering designs for the proposed sub components. The PIU will be headed by the Project Director (PD). The PIU will consists of an Environment and Social (E&S) Cell with qualified staff. This E&S Cell will assist the PIU on issues related to environmental and social management and oversee the Construction Supervision Consultant (CSC) and contractors and will compile quarterly monitoring reports on EMP compliance, to be sent to the Project Director and also shared with the World Bank, throughout the construction period. The E&S Cell will also provide trainings to the BLPA field personnel responsible for monitoring of environmental compliance during both construction and O&M phases of the project. In addition, BLPA will recruit a permanent Environmental, Health and Safety Specialist in all the proposed land ports, who will be responsible for overseeing the environmental mitigation measures during operation and maintenance period.

The overall responsibility of environmental performance including EMP implementation of the Project will rest with the PIU. Aside from their in-house environmental and social specialists, the PIU will engage construction supervision consultants (CSC) to supervise the contractors including on their execution of construction-related environmental and social management requirements and measures. The CSC will ensure adherence to the design parameters including quality requirements, as well as all EMP measures related to construction.

The E&S Cell will have adequate numbers of environmental and social scientists/specialists and maintain coordination and liaison with CSC for effective EMP implementation. Similarly, the CSC will also have environmental and social monitors who will supervise and monitor the contractors for effective EMP implementation. The contractors in turn will also have HSE supervisors who will ensure EMP implementation during construction activities and will be tasked to develop necessary detailed HSE plans as per this EMP, and oversee their implementation.

Figure 6.1: Focus Group Discussions at Sheola

Figure 6.2: Public Consultations at Sheola

Figure 6.3: National consultation meeting at Dhaka

Chapter 7: Social Impact Assessment

7.1 Executive Summery

7.1. Executive Summery

Geographical location of Bangladesh is between two major regions of Asia. South- Asia and South -East Asia provides a unique opportunity for the countries to benefit from greater cross border movement of goods and services, investment flows, and enhanced human contact. Trade activities of Bangladesh have significantly increased over the years. On the other hand, Bangladesh has large trade deficit with India. Bangladesh can reduce this trade deficit by well connectivity between India and Bangladesh. It is true that Bangladesh is important to India because it could greatly boost the economy of West Bengal. Bangladesh could also greatly benefit from transit fees and transport charges. Improving the connectivity social and economic development of both the counties can be achieved. Bangladesh Land Port Authority (BLPA) will implement the present Sheola land port improvement project funded by World Bank (WB).

Social Assessment Report and Resettlement Action Plan of Sheola Land Port adequately addresses the land, assets, structures, community property resources, livelihood, occupation and associated issues of project affected people. It incorporates principles and procedures for catering to entitlements and provision of required resources to deliver the compensation and assistance to PAPs and PAHs. Entitlement matrix outlines the provision for the same. A major emphasis has been on reducing the potential direct negative impacts of the project affected people and adjacent areas. The social components were carefully addressed in the project design, along with technical, environmental, and economic considerations. The major concerns include not only minimizing negative impacts especially displacement but also extending and enhancing positive impacts on the affected communities and large population of the project area.

The socio- economic data was collected using household survey questionnaire, village profiling guidelines, Focus Group Discussion, specific to issues and data of Enterprise level. Information was collected using on demographic profile, education, profession, health and sanitation etc. as indicators of level of poverty of the sample households project affected (PA) landscape. The collected data was compared with the national average as compiled from different studies specially BBS. The study encompasses lots of information on different issues, not in depth, just an overview that may help to have an idea about the project area landscape. Another weakness of the study due to an unavailable cause is to establish the context of the issues which is interrelated might have cause-effect relationship.

Connectivity is a demand of time between Bangladesh and India. Improving the connectivity social and economic development of both the counties can be achieved. Under this project Bangladesh Land Port Authority (BLPA) will implement the project and funded by World Bank (WB). However, some temporary livelihood loss is identified in the construction site. Shifting Sheola land port to the present project site is beside the highway at Borogram village of Dobagh Union (Sheola is another Union, previous location of land port known as ‘Sheola Land Port’) under Beanibazar Upazila. Present location will ensure easy communication, more secured facilities for both the traders and common people in both the countries. For shifting the Sheola Land Port at new location will need 22.10 acres of land, which is proposed to be acquired at the new site of Borogram popularly known as Sutarkandi (Locally known as ‘Sutarkandi’, a village of Indian side).More land may be needed in future for the present project, which may be in the vacant place. Local people and public representatives urged not to acquire homestead

area and graveyard in the locality for further requirement. Local community and affected people have positive support for the project but need proper compensation at the rate of full replacement cost and livelihood support.

Total 48 affected persons are identified as project affected person but some have more than one entitlement. Of total project households affected (PAHs), the proposed site will cause 36 land owners as affected of which 22 are identified only structures affected will suffer as temporary shifting of business for construction work. So, direct impact of the project is economic displacement and livelihood loss by the project. Among the structure losers 4 are non-titled structure owners. All structures are used for business purpose. Of the structures 3 are building and 10 are semi pacca and tin shed and no katcha structures will be affected, there are 5 pacca latrines and 3 Tube well were found in project site. Four shopkeepers are running business as tenants. Other than these losses, 5 small sized trees of local variety trees are affected on private land. No squatters and non-titled land owners are residing in the project site. The resettlement issue and project affected person will be rehabilitated at the rate of full replacement cost as per guidelines of WB OP 4.12 and common norms of donor funded project of the country. During consultation in the FGD meeting, PAP and community people expressed their positive ideas for shifting of Sheola Land Port at Borogram (Sutarkandi) of Dubagh Union. As number of project affected persons (PAPs) is not more an abbreviated resettlement action plan (RAP) is prepared separately. RAP will be implemented for resettlement issues and social issues are mainly included in the social management plan (SMP). Both SMP and Resettlement plan will be implemented under establishing a resettlement unit (RU) during construction period and it will be converted to Social Development Unit/CSR department during post project period. RP will be implemented by hiring an implementing NGO for 6 months' period. There will be a provision monitoring, social and livelihood specialist with RU for the project period.NGO will prepare a monthly and final report regarding the completion of RP and SMP. Tentative budget of the SMP is Tk. 42,175,000. RAP will deal only resettlement issues, so SMP will not include any resettlement issues.

During public consultation, all concerned urged to ensure proper compensation land and structure and suggested alternative livelihood program for project affected households (PAHs).

The project area is socially and naturally very active. In case of SMP some issues have been given priority for the increasing efforts of improving living standard of command area people. For sustainable development, livelihood skill is to be generalized among the command area population. Some stakeholders claimed, there is no source of drinking water, health facilities, and good schooling for the poor and common people, near proposed land port. From corporate social responsibility (CSR) department port authority can do something for the betterment of poor and vulnerable and they should have some facilities. The facilities are to be developed and distributed among beneficiaries through participatory social awareness and planning for the community. In addition to that, as a border area there may some crime trend like human trafficking; illegal drug route and marketing. Some other social issues are prevalent in the area, viz: early marriage, gender issues, wage discrimination, dowry, child labor, child and women persecution, kidnapping, moral degradation, addiction, gender discrimination, unhealthy sanitation, unhealthy harmful food preservation and distribution in the hotel and restaurant, AIDS, STD diseases among migrants, construction workers and transport workers. Road accidents is

a major social problem especially highways and connectivity may increase this social problem and this should have minimized through raising awareness and social rehabilitation. There may be a permanent fund 1% with the land port authority either from (toll/ tax/ tariff) their income or imposing a surcharge on the exported or imported items of the land port for rehabilitation for victims and victims' dependent. Both for social and economic sustainability, above social problem may be aggravated and to be solved through raising intensive awareness.

Free prior informed public consultation meetings were held at Sheola during project preparation and to share the draft SIA report. A public consultation meeting was held on 7th May 2016 with the local communities. Notices about the consultation meeting were circulated to the local communities through leaflets one week in advance of the meeting. Posters were also displayed at public places (at Union Parishad Bhavan, market). Additionally, meetings were also held with local government officials and customs officials.

A national consultation on draft social and environmental assessment study was held on 10th August 16 at BLPA auditorium in Dhaka. Photographs of these consultations are given at the end of report for local and national consultations, respectively. During these consultations, leaflets on key social and environmental issues were distributed to the participants (these were prepared in local language in Bangla) and big size posters were also displayed at the venue. Power point presentations were made by the social and environmental experts. Participants were encouraged to ask questions on the social and environmental issues.

Chapter 8: Economic and Financial Analysis

8.1 Introduction

8.2 Cost Analysis

8.3 Economic Analysis

8.4 Financial Analysis

8.5 Risk Analysis

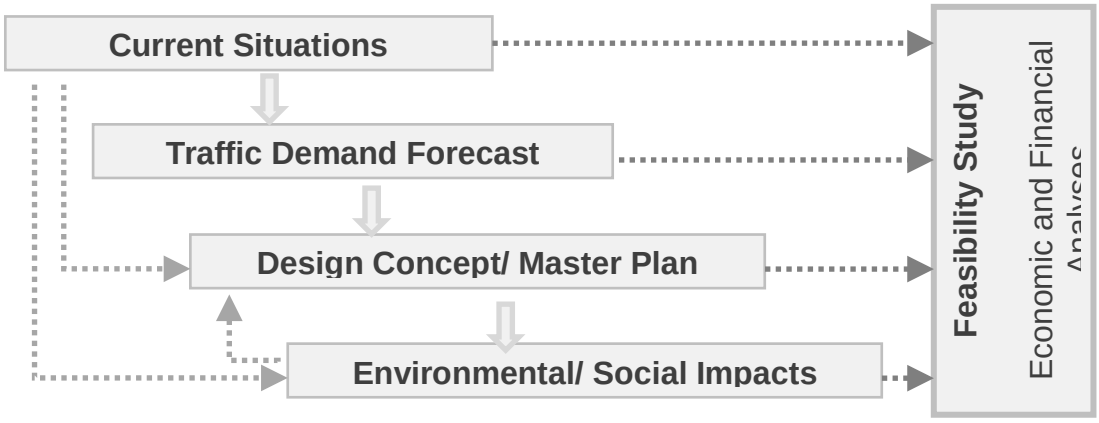
Chapter 08 Economic and Financial Analysis

8.1. INTRODUCTION

The purpose of feasibility studies is to assess priority and sustainability of a project. The procedure for undertaking feasibility studies follows a sequence of interrelated steps:

- analyzing current situations
- forecasting traffic demand
- establishing design concept and a master plan
- evaluating environmental and social impacts
- conducting economic and financial analyses

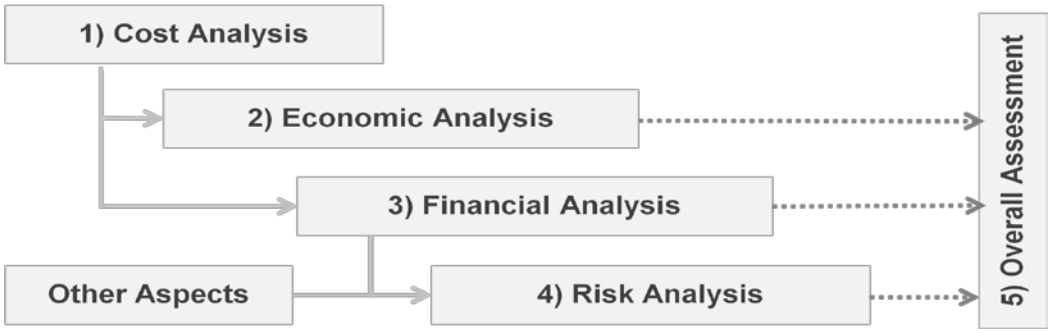
Figure 8.1: Work Flows for Feasibility Studies



The economic analysis of projects is similar in form to financial analysis: both appraise the profit of an investment. The concept of financial profit is not the same as economic profit. The financial analysis of a project estimates the profit accruing to the profit-operating entity or to the project participants, whereas economic analysis measures the effect of the project on the national economy.[3]

The procedure of economic and financial analysis is shown in Figure 8.2.

Figure 8.2: Work Flows for Economic and Financial Analysis



[3] ADB, *Guidelines for the Economic Analysis of Projects*, Feb. 1997.

8.2. COST ANALYSIS

1. Project Costs

The project costs are composed of costs for improving Sheola land port, maintaining the land port facilities, and operating the land port.

Works for improving the land port contains consultancy services for detailed design and construction supervision, land development including land acquisition, building and other infrastructure, basic services requested, equipments and plants, safety and security, mitigation on adverse social and environmental impacts.

The improvement works based on cost estimation are as follows:

1) Consultancy Services;
   Consultancy Services detailed drawing and design for implementation
2) Land Acquisition;

Land acquisition	-	22.10 acre

3) Land Development

Development Work	-	89,468 m^2 (≒ 3.66 m depth filling)
Boundary Wall	-	2,508 m long &1.50 m height
Road Network	-	13.5 m wide - 196 m long 10.5 m wide - 774.0 m long 7.0 m wide - 125.0 m long
Existing Road (Land port area) widening	-	9.49 m to 15.06 m - 490 m long
Footpath	-	1.5 m wide - 2,100.0 m long
	-	3.0 m wide - 1100 m long
Parking		840.0 m^2
Bridge (New)		12.0 wide 42.0 m long
Canal re-excavation, diversion & protection		
Landscaping	-	Plantation, Greenery, soft & hard landscaping
Garbage bin	-	2 nos
Natural pond modification & slope preparation	-	1518 Sqm

4) Building and Other Infrastructure

(Port Facilities)

Administrative Building(2-Storied),	-	2397.70 m^2
Ware house1 nos	-	2792 m^2
Trans shipment Yard Shed 2 nos	-	2800 m^2
Open Stack yard	-	7,531.00 m^2
Bangladesh & India Truck terminal	-	15,344.00 m^2
Inspection Building	-	304 m^2
Labor shed-3 nos	-	570 m^2

(Service Area)

Barrack (Border)- 2 Storied	-	720 m^2
Dormitory-2 Storied	-	720 m^2
Guest House-2 Storied	-	720 m^2
Pump House ,Substation Building	-	470 m^2
Store Building	-	470 m^2
Truck washing area	-	150 m^2
Filtration reservoir	-	1130 m^2
Spill Basin	-	4 nos
Sanitary sand fill area construction	-	4410 m^2

5) Basic Services

Area Lighting	-	89,468 m^2
Boundary wall lighting	-	2,508 m
Footpath lighting	-	3,200 m
Road Lighting	-	1,095 m
Substation Equipment & Diesel Generator	-	1,600 KVA -2 nos, Diesel generator 650 KVA-1no, Diesel generator 110 KVA – 1 nos, (Server)
Solar Power	~	25,000 W
Underground Water Reservoir	-	100 m^3
External Drainage	-	2,000 m
Deep tube-well 2 nos.	-	150 mm dia 230 M long

6) Equipments and Plants

Weighing Bridge	-	100 metric ton capacity 4 nos
IT Solution	-	Networking & Cabling, Server, Internet Uplink
Port & Freight Management	~	Port Management S/W & H/W, Maintenance

Note: All kinds of handling equipments shall be of out-source.

7) Safety & Security

Fire Protection, Fire detection
CCTV System, Alarm, PA, BMS, Border Check Post, etc.

8) Social Impacts Mitigation
Especially resettlement and relocation

9) Environmental Impact Mitigation

The Administrative Complex would have an office building with spaces for port, customs, immigration, bank, health and quarantine facilities; Transshipment yard, transit shed, passenger lounge and a shed /lounge for physical verification of the goods and a ware house

The facilities of the port would be enforced through construction of a new infrastructure and ware houses and out sourced leasing of equipment like weight

bridge and weighting scales, heavy duty forklifts, pay loader, pick up vans and other handling equipment. The residential area would have housing complex, medical center, guest house and dormitory & Barrack,

For external work includes land development basic services provision, an electrical substation, telephone line and water supply, sanitation, sand filtration, filter and drainage system will be installed.

Ancillary works should be done by the other GOB department

- Up gradation of 16 Km express feeder line (BREB Deposit) (BREB)
- Beautification for tourist attraction will be undertaken
- Road development & widening (Shaula to Dubag) (RHD)

The improvement costs for Sheola land port is estimated as Taka 2,907 million (equivalent to US$ 36.9 million). Among the cost items for improving Sheola land port, land acquisition comes out to be 9.49%.

The improvement is planned to be in two phases. The works plans to be done from 2016 to 2019 as the first phase and from 2024 to 2028 as the second phase. Around 69% of the costs (around UD$ 36.9 million) will be invested in the first phase.

Table 8.1: Improvement Costs for Sheola Land Port

No.	Description	Total Cost		1st Phase cost		2nd Phase cost		Percentage	
		(1,000Tk)	(1,000$)	(1,000Tk)	(1,000$)	(1,000Tk)	(1,000$)	Phase-1	Phase-2
1	**Consultancy Services Cost**	**30,000**	**381**	**21,100**	**255**	**9,900**	**126**	67%	33%
2	**Land Cost**	**275,808**	**3,500**	**275,808**	**3,500**	**-**	**-**	100%	0%
	Land Acquisition	275,808	3,500	275,808	3,500	-	-		
3	**Development Cost**	**649,512**	**8,243**	**272,795**	**3,462**	**376,717**	**4,781**	42%	58%
4	**Building & Infrastructure**	**1,228,610**	**15,591**	**801,268**	**10,168**	**427,342**	**5,423**	65%	35%
	Port Facilities	1,042,297	13,227	614,955	7,804	427,342	5,423	59%	41%
	Service Area	186,313	2,364	186,313	2,364	-	-	100%	0%
5	**Basic Service Cost**	**165,109**	**2,095**	**111,585**	**1,416**	**53,524**	**679**	68%	32%
	External Electrification	147,885	1,877	100,562	1,276	47,323	601	68%	32%
	Ext. Water Supply/Sanitation	17,224	219	11,023	140	6,201	79	64%	36%
6	**Equipments and Plants**	**220,110**	**2,793**	**186,615**	**2368**	**33,495**	**425**	85%	15%
	Weighing Bridge (2 nos.)	60,610	769	30,305	385	30,305	385	50%	50%
	IT Solution (Networking, etc.)	55,000	698	53,900	684	1,100	14	98%	2%
	Port &freight management	104,500	1,326	102,410	1,300	2,090	27	98%	2%
7	**Safety & Security**	**182,119**	**2,311**	**178,476**	**2,265**	**3,642**	**46**	98%	20%
8	**Social impact mitigation cost**	**139,984**	**1,776**	**139,984**	**1,776**	-	**-**	100%	0%
9	**Environmental impact mitigation cost**	**15,865**	**201**	**6,346**	**81**	**9,519**	**121**	40%	60%
	Grand Total	**2,907,116**	**36,892**	**1,992,978**	**25,292**	**914,139**	**11,601**	69%	31%

Note: 1 USD = 78.8 Taka

2. Operation and Maintenance Costs

After the improvements of Sheola land port, yearly costs for maintaining the land port facilities and for operating the land port should be paid for achieving the objectives to improve the land port.

The additional costs for operation and maintenance (O & M costs) is estimated as USD 219346 in each year. The details are shown in Figure 8.2.

Table 8.2: Operation and Maintenance Costs for Sheola Land Port

Items	Sheola Land Port	
	Taka	USD
Maintenance & Management of Port Facility	122,500	1,555
Other Establishment Costs	2,289,000	29,048
Sub-total (Maintenance Cost)	2,411,500	30,603
Staff Remuneration of BLPA	7,972,984	1,01,180
Training	1,500,000	19,036
Environmental Monitoring Costs	5400000	68528
Sub-Total (Operation Cost)	14872984	188743
Total	17284484	219346

Note: 1) 1 USD = 78.8 Taka

2) Because the staffs of the organizations will be increased, the O & M costs will be changed as: USD 483961 in 2025, USD 587313 in 2035.

8.3. ECONOMIC ANALYSIS

1. Quantifying the Costs and Benefits

The purpose of the economic analysis of projects is to bring about a better allocation of resources, leading to enhance incomes for investment or consumption. Therefore, the costs and benefits of the best project alternative, defined and valued from the perspective the national economy, are compared to assess economic efficiency.

In order to estimate the economic costs, shadow prices are used to take into account the major impacts of a project. For project outputs, the shadow price is based on the supply price, the demand price, or a weighted average of the two. Economic costs for this project are calculated by applying conversion factor of 0.861[4] to the financial costs which are composed of improvement costs and O & M costs.

Benefits of economic analysis are also based on social benefits. Development and/or improvement of a land port are not directly produce products that have prices in the markets but indirectly supply social infrastructures that promote activities for customs, immigration and quarantine (CIQ) and related facilities. Therefore, it is very much difficult to calculate the social benefits of the project.

[4] ADB, 'Section 3: Summary and Recommendation for Benapole Land Port', *Bangladesh: Port and Logistics Efficiency Improvement*, July 2011.

It is assumed that the social benefit of a land port is value added of the trade turned out through the land port, and that the amount of 'value added' is 10% of the value of the trades through the land port. The benefit of immigration is relatively small (compared to trade benefits) and is ignored.

The economic benefits of improving Sheola land port are estimated as around USD 1 million in 2016, and USD 28 million in 2040.

Table 8.3: Economic Benefits of Improving Sheola Land Port

(Unit: USD 1,000/year)

Items	2020	2025	2030	2035	2040
Total Trade	25,133	55,653	109,100	187,880	297,150
10% of Trade Value	2,513	5,565	10,910	18,788	29,715
With - Without	1,013	4,065	9,410	17,288	28,215

Note: 'Without' is estimated as US$ 1,500,000 because the current capacity of Sheola land port is already full. (Current trade value through Sheola land port in around US$ 16,029,000.)

2. Economic Analysis

The basic condition of cost-benefit analysis are:

- economic costs of improvement = USD 28.8 million
- discount rate = 12%
- analysis period = 30 years after improvement (2020 ~ 2049)

(Note: Detailed inputs are shown in Table 8.4.)

The results of cost-benefit analysis turn out to be as follows:

- internal rate of return (IRR) = 17 %;
- net present value (NPV) = USD 20.54 million
- cost benefit ratio (B/C ratio) = 1.87

Even though the effects of the improvement in immigration and quarantine facilities are not included, the project is estimated to be economically viable.

(Note: The construction period of the 1st phase is 2016~2019, the 2nd phase 2024~2028 in financial year.)

Table 8.4: Cost-Benefit Analysis

Year	COST (1,000 $/year)				BENEFIT (1,000 $/year)		(B)-(A)
	Construction Cost	O & M Cost	Total Cost (A)	Discounted Total Cost	Total Benefit (B)	Discounted Total Benefit	
2016	4,355	0	4,355	4,355	0	0	-4,355
2017	7,622	0	7,622	6,805	0	0	-7,622
2018	6,533	0	6,533	5,208	0	0	-6,533
2019	3,266	0	3,266	2,325	0	0	-3,266
2020	0	102	102	65	1,013	644	912
2021	0	102	102	58	1,338	759	1,236
2022	0	102	102	52	1,766	895	1,665
2023	0	102	102	46	2,332	1,055	2,230
2024	1,998	102	2,099	848	3,079	1,244	980
2025	3,496	330	3,825	1,379	4,065	1,466	240
2026	2,996	330	3,326	1,071	4,808	1,548	1,482
2027	1,498	330	1,828	525	5,687	1,635	3,859
2028	0	330	330	85	6,727	1,727	6,397
2029	0	330	330	76	7,956	1,823	7,626
2030	0	330	330	67	9,410	1,925	9,080
2031	0	330	330	60	10,627	1,942	10,298
2032	0	330	330	54	12,002	1,958	11,672
2033	0	330	330	48	13,554	1,974	13,225
2034	0	330	330	43	15,308	1,991	14,978
2035	0	419	419	49	17,288	2,007	16,869
2036	0	419	419	43	19,067	1,977	18,649
2037	0	419	419	39	21,030	1,947	20,611
2038	0	419	419	35	23,195	1,917	22,776
2039	0	419	419	31	25,582	1,888	25,163
2040	0	419	419	28	28,215	1,859	27,796
2041	0	419	419	25	28,215	1,660	27,796
2042	0	419	419	22	28,215	1,482	27,796
2043	0	419	419	20	28,215	1,323	27,796
2044	0	419	419	18	28,215	1,181	27,796
2045	0	419	419	16	28,215	1,055	27,796
2046	0	419	419	14	28,215	942	27,796
2047	0	419	419	12	28,215	841	27,796
2048	0	419	419	11	28,215	751	27,796
2049	0	419	419	10	28,215	670	27,796
Total	31,764	10,083	41,847	23,540	487,985	44,083	446,138

Sensibility analysis is made in the worst case: costs will be 20% higher and benefits 20% lower. In these conditions, IRR = 13.7.%, NPV = USD 7.02 million, B/C ratio = 1.25. It shows that the project is economically very good.

8.4. FINANCIAL ANALYSIS

1. Quantifying the Costs and Profits

The financial analysis of projects evaluates soundness in cash flows in view of investors of the project. The capital costs are directly used as the input costs which are shown in Table 8.1 and Table 8,2,

The profits in view of the Bangladesh government come from truck entry fee, landing fee, cargo handling charge, cargo removing charge, space rental (office and warehouse), and other income such as guest house, equipment rental service, etc..

Current fees and charges for relevant activities using the land port were investigated in the field and from Bangladesh Land Port Authority (BLPA). The average unit fees and charges are as follows:

- truck entree fee ~ 94.28 Taka/truck
- cargo landing fee ~ 47.16 Taka/ton
- cargo handling charge (import) ~ 182.43 Taka/ton
- cargo handling charge (export) ~ 216.86 Taka/ton
- removal charge (import/export) ~ 83.07 Taka/ton
- space rental (warehouse) ~ 13.21 Taka/m^2
- space rental (open yard) ~ 9.42 Taka/m^2
- office space rental calculated ~ 2,400,000 taka
- other income calculated ~ 9,050,000 Taka

After the land port improvement, yearly income of Sheola land port is estimated to be USD 1.68 million in 2020 and USD 28.99 million in 2040. The detail results are shown in Table 8.5.

Table 8.5: Revenue (income) Estimation for Sheola Land Port

(Unit: US$ thousand /year)

Items	2020	2030	2040
Customs	1,656	13,194	28,846
Immigration	19	58	107
BLPA	2	17	36
Total	1,677	13,269	28,989

2. Financial Analysis

The basic condition of cost-benefit analysis are:

- financial costs of improvement = USD 36.9 million
- discount rate = 12%
- analysis period = 30 years after improvement (2020 ~ 2049)

(Note: Detailed inputs are shown in Table 8.6.)

The results of cost-benefit analysis turn out to be as follows:

- internal rate of return (FIRR) = 15.3 %;
- financial net present value (FNPV) = USD 15.72 million
- profit index (PI) or financial B/C ratio = 1.57

Even though the effects of the improvement in immigration and quarantine facilities are not included, the project is estimated to be financially viable.

(Note: The construction period of the 1st phase is 2016~2019, the 2nd phase 2024~2028 in financial year.)

Table 8.6: Cost-Revenue Analysis Table

Year	Cost (1,000 $/year)				Revenue (1,000 $/year)			(B)-(A)
	Construction Cost	O & M Cost	Total Cost (A)	Discounted Total Cost	Import/Export related fee	Total Revenue (B)	Discounted Total Revenue	
2016	5,058	0	5,058	5,058	0	0	0	-5,058
2017	8,852	0	8,852	7,904	0	0	0	-8,852
2018	7,587	0	7,587	6,049	0	0	0	-7,587
2019	3,794	0	3,794	2,700	0	0	0	-3,794
2020	0	118	118	75	613	613	390	495
2021	0	118	118	67	781	781	443	663
2022	0	118	118	60	996	996	504	878
2023	0	118	118	53	1,269	1,269	574	1,151
2024	2,320	118	2,438	985	1,617	1,617	653	-821
2025	4,060	383	4,443	1,602	2,062	2,062	743	-2,381
2026	3,480	383	3,863	1,244	2,942	2,942	947	-921
2027	1,740	383	2,123	610	4,199	4,199	1,207	2,076
2028	0	383	383	98	5,992	5,992	1,538	5,610
2029	0	383	383	88	8,552	8,552	1,960	8,169
2030	0	383	383	78	12,205	12,205	2,497	11,822
2031	0	383	383	70	13,406	13,406	2,449	13,023
2032	0	383	383	62	14,726	14,726	2,402	14,343
2033	0	383	383	56	16,175	16,175	2,356	15,792
2034	0	383	383	50	17,767	17,767	2,310	17,384
2035	0	486	486	56	19,516	19,516	2,266	19,030
2036	0	486	486	50	20,966	20,966	2,173	20,479
2037	0	486	486	45	22,523	22,523	2,085	22,037
2038	0	486	486	40	24,196	24,196	2,000	23,710
2039	0	486	486	36	25,994	25,994	1,918	25,508
2040	0	486	486	32	27,925	27,925	1,840	27,439
2041	0	486	486	29	27,925	27,925	1,643	27,439
2042	0	486	486	26	27,925	27,925	1,467	27,439
2043	0	486	486	23	27,925	27,925	1,310	27,439
2044	0	486	486	20	27,925	27,925	1,169	27,439
2045	0	486	486	18	27,925	27,925	1,044	27,439
2046	0	486	486	16	27,925	27,925	932	27,439
2047	0	486	486	14	27,925	27,925	832	27,439
2048	0	486	486	13	27,925	27,925	743	27,439
2049	0	486	486	12	27,925	27,925	663	27,439
Total	36,892	11,711	48,603	27,340	495,747	495,747	43,059	447,144

Sensibility analysis is made in the worst case: costs will be 20% higher and revenues 20% lower. In these conditions, FIRR = 12%, FNPV = USD 1.64 million, PI = 1.05. It shows that the project is financially very good.

8.5. RISK ANALYSIS

The risks are expected to occur in implementing Sheola land port improvement and in operating the land port. Those are in the procedures of:

- land acquisition issue
- construction issue
- organizational and institutional issue
- CIQ process issues with relevant charges

All the risks are expected to be overcome in the process of cooperation with World Bank from the beginning. For some risk prevention, risk monitoring indices could be developed and operated.

Table 8.7: Risks and Mitigation Means

Period	Risk Issues	Risk Mitigation
Construction	land acquisition issue	- having public hearings - successive monitoring
	construction issue	- social & environmental aspects - water treatment
Operation	organizational and institutional issue	- internal preparation in BLPA - cooperation with other authorities
	CIQ process issues with relevant charges	- encouraging trades through the land port (better services with lower charges)

In conclusion, the improvement project of Sheola land port is economically and financially viable. The project will play an important role in promoting trade between Bangladesh and India on the hot economic corridor linking Sylhet in Bangladesh and Hailakamdi, Assam in India.

Even though there will be some risks, all the risks will be overcome with easy while the implementation agency, BLPA, will monitor them in construction and operation periods.