MINUTES OF DISCUSSIONS ON THE BASIC DESIGN STUDY ON AID FOR INCREASED FOOD PRODUCTION PROGRAM IN THE PEOPLE'S REPUBLIC OF BANGLADESH

In response to the request of the Government of the People's Republic of Bangladesh for assistance under Aid For Increased Food Production Program, the Government of Japan decided to conduct a basic design study on the program (hereinafter referred to as "the Program") and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Bangladesh the Study Team headed by Mr. Koichi Morita, Assistant Director, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs from 27th March to 19th April, 1986.

The Team had a series of discussions on the program with the officials concerned of the Government of the People's Republic of Bangladesh in the Ministry of Agriculture, Ministry of Food, Finance Division, Planning Commission, Bangladesh Agricultural Development Corporation, Bangladesh Water Development Board and Bangladesh Bank and also conducted a field survey in Dhaka and Comilla areas from 27th ~~April~~ March to 5th ~~March~~ April, 1986. A Joint meeting between the Team and the GOB Officials was held in the ERD on April 3, 1986 under the chairmanship of Mr. M. Akhtar Ali, Joint Secretary, ERD.

As a result of the study, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Program.

6th April, 1986

Mr. Koichi Morita,
Leader of the Basic Design
Study Team
ON AID FOR INCREASED FOOD
PRODUCTION PROGRAM, JICA.

6.4.86
Mr. Md. Soakat Ali
Deputy Chief
External Resources Division,
Ministry of Finance

ATTACHMENT

1. The Program intends to support the self-reliant efforts of Bangladesh for increased food production with the agricultural commodities such as fertilizers, agricultural chemicals and agricultural machinery/equipment to be provided by the Government of Japan under Japan's Grant Aid Program.

2. The Ministries concerned with implementation of the above program are Ministry of Finance, Ministry of Planning, Ministry of Agriculture, Ministry of Irrigation, Water Development and Flood Control, and Ministry of Food.

   External Resources Division (ERD) in the Ministry of Finance is responsible for the coordination of the Program.

   The implementation process of the Program is charted as Annex I.

3. As the result of the discussion, taking into consideration of the requests made by Ministries/Agencies concerned, the Study Team has confirmed that the final list of agricultural commodities based on the tentative list as described in Annex II for the Program in the Fiscal Year 1985 shall be submitted in April 1986.

4. The Study Team has further confirmed that the Government of Bangladesh has the desire to implement the Program continuously in Fiscal Year 1986 and onward.

~~For Fiscal Year 1986, the concerned Ministries/Agencies have submitted a tentative list of required agricultural commodities which are summerized in Annex III attached.~~

The study Team has requested the Government of Bangladesh to finalize the request for Fiscal Year 1986 at an earliest possible time, and the Government of Bangladesh has expressed its estimate that the request to be finalized and submitted within one month time.

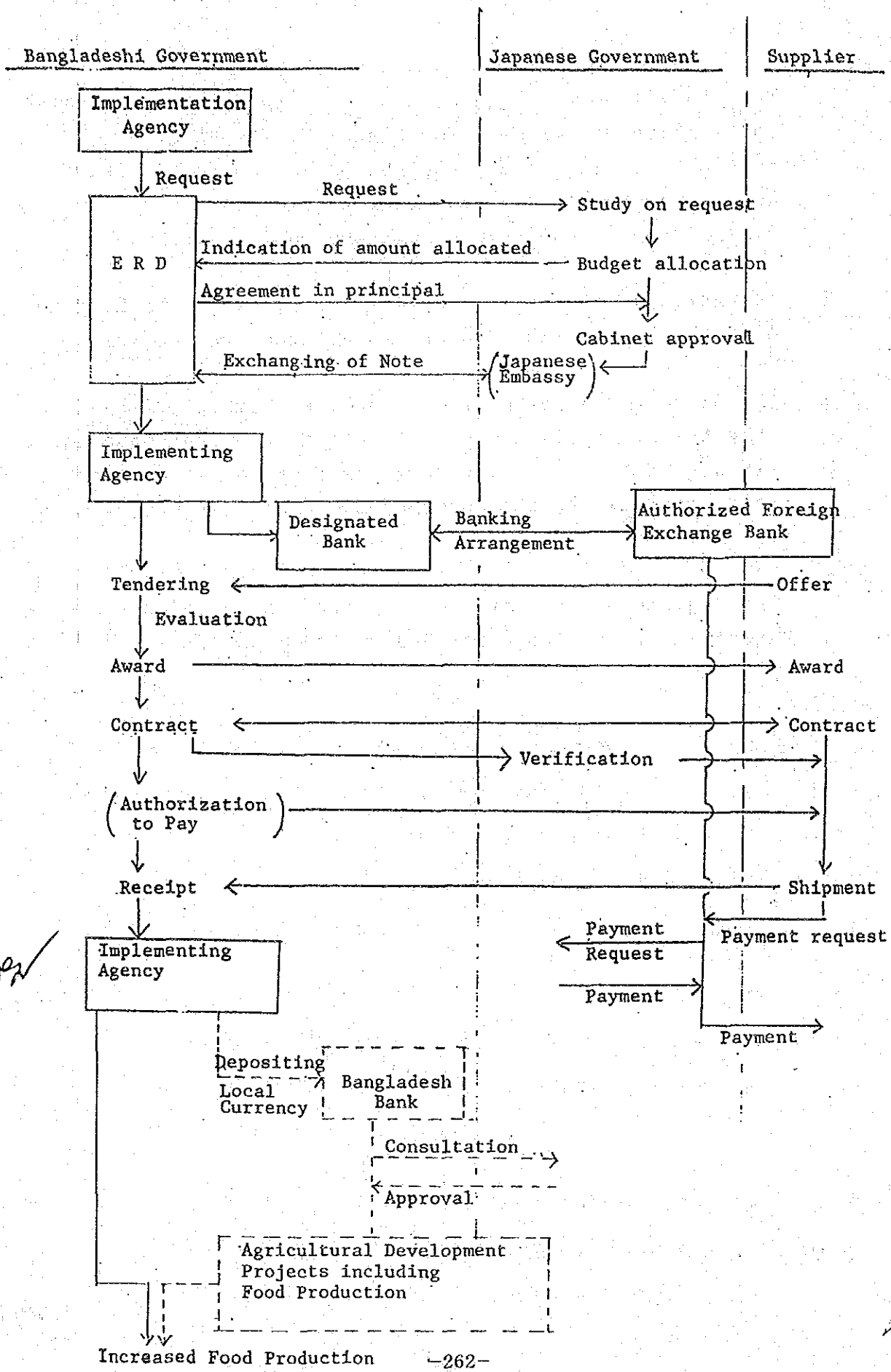
5. Tentative schedules for the implementation of the Programs of both FY 1985 and 1986 are as attached in Annex III.

6. The Bangladeshi authorities concerned have confirmed that the necessary measures to be taken by the Government of Bangladesh are listed in Annex IV on condition that this grant aid by the Government of Japan is extended to the Program.

7. The Bangladeshi authorities concerned have understood and accepted the system described by the Study Team.

Annex-I

GENERAL PROCESS OF PROGRAM IMPLEMENTATION



Annex II

REQUIREMENT OF THE PROGRAM FOR FY 1985

Name of the Items	Implementating Agency / Ministry
1. DTW commissioning materials (such as gear head)	BADC / Ministry of Agriculture
2. Spare parts for DTW, LLP and STW engines	"
3. Floating Pumps	"
4. Pesticides (Methyl Bromide)	Ministry of Food
5. Pesticides	Plant Protection Department, Ministry of Agriculture
6. Submersible DTW Pumps (Electric)	Bangladesh Water Development Board
7. Vibrating Pile Driving Hammer (Electric)	"
8. Dragline	"
9. Bulldozer	"
10. Well-point Pump and Accessories	"
11. Shearing Machine	"
12. Bending Machine	"
13. Press Machine	"
14. Spare Parts for Equipments	"
15. Spare Parts for Vehicles	"
16. Sheet Piles (U Type)	"
17. Rail Mounted Tower Crane	"

Name of the Items	Implementing Agency / Ministry
18. Trucks (7~8 MT)	Ministry of Food
19. Moisture Meter	"
20 Rice Dryer	"
~~21 Hand Tillers~~	~~Chief Controller of Imports & Exports~~

Annex - III-1

IMPLEMENTATION SCHEDULE FOR 1985 FY

Work Item	1986 Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Exchange of Notes	0								
Banking Arrangement		0							
Tender Announcement			0						
Tendering				0					
Award, Contract					0				
Verification of Contract						0			
Authorization to Pay							0		
Completion of shipment								0	

Annex - III-2

IMPLEMENTATION SCHEDULE FOR 1986 FY

Work Item	Apr.	May	Jun	Jul	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Exchange of Notes				0								
Banking Arrangement					0							
Tender Announcement						0						
Tendering							0					
Award, Contract								0				
Verification of Contract									0			
Authorization to Pay										0		
Completion of Shipment											0	

Annex IV

Necessary measures to be taken by the Government of the People's Republic of Bangladesh are as follows:

1. To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement

   (a) Advising Commission of Authorization to Pay

   (b) Payment Commission

2. To ensure smooth unloadings and customs clearance at ports of disembarkation in the Bangladesh.

3. To ensure that the products purchased under the Grant will make effective contribution to the increase of food production and eventually to the stabilization and development of the Bangladeshi economy.

4. To bear all the expenses, other than those to be borne by the Grant.

5. To maintain and use properly and effectively the agricultural equipments and machineries purchased under the Grant.

6. To deposit in local curreny, at least an amount equivalent to two-thirds of the FOB value of the aid offered by Japan. The fund thus deposited is to be used as the local currency component of agricultural development purposes including the increase of food production. For the utilization of the fund the authorities concerned of the two Government will consult with each other.

REFERENCE

1. BASIC DATA SHEET OF BANGALADESH

(As of August 1985)

		1960	1970	Most Recent	Remarks
Area	Total (000 sq km)			144.00	
	Cropped Land Per Capita (ha)		0.13	0.09	(1983)
	Total Arable Land (thousand sq km)			86.51	(1983)
Population	Total (million; mid-year)		69.95	96.4	(1984)
	Density (persons/sq km)			669	(1984)
	Annual Growth Rate (%)			2.4	(1984)
GNP Per Capita (US$) a/				130	(1983)
Social Development Indicators	Life Expectancy at Birth (years)	37	42	48	(1981)
	Infant Mortality (per 1,000 live births)	159	150	125	(1984)
	Access to Safe Water (% of population)				
	In Urban Areas	-	13	26	(1982)
	In Rural Areas	-	47	36	(1982)
	Daily Per Capita Calorie Supply (cal.)	-	2100	1850	(1981)
	Daily Per Capita Protein Supply (gm)	-	45	42	(1983)
	Persons per Physician	-	8430	8810	(1981)
	Primary School Enrollment (%)	47	52	54	(1984)
	Adult Literacy Rate (%)	22	-	26	(1980)
	Income Dis'n: % Income Received				
	Highest 5% of Households	18.3 (1963)	-	14.6	(1974)
	Highest 20% of Households	44.5 (1963)	44.1 (1967)	42.2	(1974)
	Lowest 20% of Households	6.9 (1963)	8.7 (1967)	6.9	(1974)
	Lowest 40% of Households	17.9 (1963)	19.6 (1967)	18.2	(1974)

a/ World Bank Estimate

(Reference in text: page 2, para 5)

		FY1979	FY1980	FY1981	FY1982	FY1983
Labor Force (1,000)	Total	30,050	30,750	31,440	32,080	32,750
	Employed	18,600	18,920	19,530	20,450	20,500
	Agriculture, Forestry & Fishery	12,900	13,000	13,300	14,000	14,000
	Mining & Manufacturing	1,500	1,500	1,600	1,600	1,730
	Others	4,200	4,420	4,730	4,850	4,770
	Unemployed and/or Underemployed	11,450	11,830	11,910	11,630	12,260
	Unemployment/ Underemployment Rate(%)	38.1	38.5	37.9	36.3	37.4

		FY1980	FY1981	FY1982	FY1983	FY1984	FY1985
Gross Domestic Product a/ (Mn Taka)	GDP at current market price	182.1	209.7	232.6	265.6	314.4	362.0
	GDP at 1972/73 factor cost	65.0	69.2	69.8	72.4	75.4	78.3
	Growth Rate(%)	2.7	6.5	6.9	3.7	4.1	3.8
GDP at 1972/73 factor cost a/ (percentage Share by Industry)	Aagriculture, Forestry and Fishery	55.1	55.4	54.6	55.1	54.8	54.4
		8.3	8.4	8.6	8.3	8.5	8.5
	Manufacturing	5.7	5.5	5.5	5.1	5.0	4.9
	Construction						
	Electricity and Gas	0.3	0.3	0.4	0.4	0.4	0.5
	Transport and Communications	7.5	7.3	7.3	7.2	7.2	7.4
	Trade	5.4	5.3	5.3	5.3	5.3	4.1
	Others	17.7	17.8	18.3	18.6	18.8	20.2
GDP at 1972/73 factor cost Growth rate-by Industry) a/	Agriculture, Forestry and Fishery	1.7	7.1	-0.6	4.7	3.6	3.1
	Mining and Manufacturing	0.2	8.8	2.9	0.3	6.9	2.8
	Others	4.8	4.6	2.8	5.0	2.6	5.1

a/ Revised

		FY1980	FY1981	FY1982	FY1983	FY1984	FY1985
Price Indexes	Wholesale (1969/70=100)	516.1	571.6	629.5	642.7	747.0	862.0 a/
	Annual Change (%)	11.1	10.8	10.1	3.1	16.2	15.4
	Consumer (1973/74=100)	b/ 235.1	258.8	299.2	329.1	361.5	430.0 c/
	Annual Change (%)	17.0	10.0	15.6	10.0	9.8	11.5
Money and Credit (Mn Taka)	Money Supply	16,985.9	21,693.4	21,701.4	26,747.8	36,556.5	39,509.4 d/
	Annual Change (%)	14.0	27.7	0.0	23.2	36.7	8.1
	Time Deposits	17,320.7	22,031.9	25,485.2	33,502.9	48,725.4	57,395.4 d/
	Credit to Private Sector	15,132.5	19,661.3	23,825.1	32,655.3	50,806.9	65,153.8 d/
Central Government Finance Mn Taka)	Current Revenue	18,345	23,430	25,538	27,107	29,529	34,770
	Current Expenditure	13,407	14,815	18,500	21,467	24,520	29,300
	Current Surplus/Deficit (-)	4,938	8,615	7,038	5,640	5,009	5,470
	Capital Expenditure	20,820	23,690	27,153	29,771	30,079	35,084
	Overall Surplus/Deficit (-)	-15,882	-15,075	-20,115	-24,131	-25,070	-29,614
	Financing	15,882	15,075	20,115	24,131	25,070	29,614

a / Index for March 1985.
b / Average for Dhaka, Chittagong and Khulna.
c/ Index for Dhaka For March 1985.
d/ As of March 1985.

		FY1980	FY1981	FY1982	FY1983	FY1984	FY1985
	Domestic Borrowings, Net	2,920	5,000	-	-	1,920	-
	Foreign Borrowings & Grant a/	13,144	10,640	20,810	23,620	23,107	26,180
	Use of cash balances & other sources	182	565	-695	511	43	3,434 b/
Balance of Payments (Mn $)	Exports(FOB)	761	711	626	719	822	900
	Imports(CIF)	-2,441	-2,533	-2,572	-2,310	-2,353	-2,800
	Trade Balance	-1,680	-1,822	-1,945	-1,591	-1,531	-1,900
	Services(Net)	13	15	-70	-112	-33	-90
	Transfers (Net) c/	157	379	425	598	552	450
	Current Balance c/	-1,510	-1,428	-1,592	-1,105	-1,012	-1,540
	Capital Flows (Net) c/	1,392	1,404	1,464	1,345	1,178	1,402
	Overall Balance	-118	-24	-128	240	166	-138
Leading export commodities (Percentage share)	Raw Jute	19.8	16.7	16.1	15.9	14.6	15.1
	Jute Manufacturers	53.2	51.6	46.6	45.5	43.2	44.6
	Leather	9.1	8.0	10.1	84.4	10.7	7.9
	Tea	4.6	5.7	6.1	6.7	8.7	7.9
	Fish	5.1	5.7	8.6	10.5	9.7	9.2

a/ Including project aid, Local currency proceeds from commodity aid, and net local currency receipts from food aid and domestic sales of foodgrain(inclusive of local and foreign purchases).

b/ Includes TK2,400 million from food account.

c/ Official transfers are lumped with external loans included in capital flows, together with net drawings on IMF and other capital. Capital flows also include errors and omissions.

		FY1980	FY1981	FY1982	FY1983	FY1984	FY1985
Leading import commodities (Percentage share)	Petroleum & Petroleum Products	16.2	19.3	21.3	17.8	15.2	12.8
	Wheat	18.1	8.3	9.3	12.5	14.6	13.8
	Rice	8.1	1.6	1.8	4.2	2.4	6.1
	Chemicals	12.5	11.6	12.8	11.3	13.1	-
	Machinery & Transport Equipment	23.0	27.2	26.1	19.5	19.9	-
Terms of Trade	(1972/73=100) a/	70	51	42	47	57	66

		FY1980	FY1981	FY1982	FY1983	FY1984	FY1985
Exchange Rate	(Taka/US$) (end of period)	16.251	19.847	24.074	25.000	26.000	30.000 b/
International Reserves (Mn $)	Total (end of year) (mos)	321.2	155.3	207.1	541.6	405.7	321.3 c/
		1.6	0.7	1.0	2.8	1.9	1.4
External Debt b/ (Mn $)	Publicly guaranteed outstanding inc. Undisbursed (end of period)	5,486.2	6,174.8	6,996.0	6,819.4		
	Disbursed only (end of period)	3,521.1	3,851.8	4,352.9	4,184.5		
	Private Non-guaranteed, Outstanding, Disbursed only (end of period)	-	-	-	-		

a/ Revised
b/ As of 1 November 1985
c/ As of end July 1985
d/ Revised

	FY1980	FY1981	FY1982	FY1983
Principal Repayments (total for period)	39.8	51.0	63.1	79.7
Interest Payments (total for period)	35.7	46.6	48.4	63.3
Debt Service Ratio (%) a/	9.9	13.7	17.8	19.9

a/ Debt service payments as percentage of exports of goods

TECHNICAL SPESIFICATIONS

BAN/2KR-1

Item No. PPW-1 AGRO-CHEMICAL, FENITROTHION 50% w/w EC

Quantity Required:

Specifications

1. Chemical Name:
   dimethyl 4-nitro-m-tolyl phosphorothionate

2. Minimum Purity:
   50% w/w

3. Physical Properties:

   3.1 Free 3-methyl-4-nitrophenol, and easily hydrolised impurities calculated as 3-methyl-4-nitrophenol
   Maximum: 2% of the fenitrothion content

   3.2 Acidity or alkalinity
   Maximum acidity:
   0.3%, calculated as H_2SO_4
   Maximum alkalinity:
   0.05%, calculated as NaOH

   3.3 Water
   Maximum: 0.2%

   3.4 Flash point
   The flash point of the product shall not be lower than 22.8 °C (Abel Method)

   3.5 Emulsion stability and re-emulsification
   After the heat stability test (4.2) the product when diluted at 30 °C with CIPAC water D (342 PPM hardness) shall comply with the following:

Time after dilution	Limit of stability
0h	Initial emulsifiability: complete
0.5h	Cream, maximum: 2 ml.
2.0h	Cream, maximum: 4 ml. Free oil: Nil
24.0h	Re-eulsifioation: complete
24.5h	Cream, maximum: 3 ml. Free oil: max. 0.5 ml

BAN/2KR-1

Specifications

4. Storage Stability:

4.1 Low temperature stability

After storage at 0°C for 7 days, the volume of the solid/or liquid which separates shall not be more thn 0.3%.

4.2 Heat stability

After storage of 54 ± 2°C for 14 days, the concentrate shall continue to comply with 2, 3.1 and 3.5.

5. Packings and Markings:

5.1 Packings

The material must be packaged in suitable, clean containers which do not affect, and are not affected by the product contained. The container must adequately protect the product from exterior influences including moisture contamination and compaction and from loss by vaporization. Where necessary, containers shall be lined with a suitable material to prevent corresion or deterioration of contents or container. Outer surface of container must be so constructed or treated as to prevent corrosion or deterioration of container and of the product label. Containers must comply with all applicable national & international transporation safety & other regulations.

The pesticide product, container & contents, must be sufficiently stable to most all product specifications for a period of at least two years.

5.2 Markings

All the packages shall bear durably and legible marked on the containers.

BAN/2KR-2

Item No. PPW-2 AGRO-CHEMICALS, PHENTHOATE 50% w/v EC

Quantity Required:

Specifications

1. Chemical Name:
   S-[(ethoxy carbonyl) benzyl] dimethyl phosphorothiolothionate

2. Minimum Purity:
   50% w/v EC

3. Physical Properties:

   3.1 Appearance
   Light brown liquid

   3.2 Odor
   Aromatic

   3.3 Flash point
   32°C

   3.4 Water content
   Max. 0.2%

   3.5 Boiling point
   137°C

   3.6 Specific gravity
   1.065 ± 0.005 at 20°C

   3.7 Acidity/alkalinity
   Max. acidity 0.20%
   Alkalinity 0.10%

   3.8 Emulsion stability
   After the heat stability test the product, when diluted at 30°C with CIPAC standard water D(342 PPM hardness) shall comply with the following:

Time after dilution	Limit of stability
0	Initial emulsifiability: complete
0.5h	Cream: Maximum 1 ml.
2h	Cream: Maximum 4 ml. Free oil: Nil.
24h	Re-emulsification: complete
24.5h	Cream: Maximum 4 ml Free oil: Maximum 2 ml.

Specifications

4. Storage stability:

4.1 Low temperature stability

After storage at 0°C for 7 days, the volume of solid or liquid which separate shall not be more than 0.3%.

4.2 Heat stability

After storage at 54° ± 2°C for 14 days the active ingredient shall not de eriorate by more than 10% of the declared content.

5. Packing and Marking:

5.1 Packing

The material must be packaged in suitable, clean containers which do not affect and are not affected by the product contained. The container must adequartely protect the product from exterior influences including moisture contamination and compaction and from loss by vaporization. Where necessary, containers shal be lined with a suitable material to prevant corrosion or deterioration of contents or container. Outer surfaces of containers must be so constructed or treated as to prevent corrosion or deterioration of container & of the product label.

The pesticide product, container and contonts, must be sufficient stable to most all product specifications for poriod of at least two years.

5.2 Marking

All the packages shall bear durably and logibly marked on the containers.

BAN/2KR-3

Item No. PPW-3 AGRO-CHEMICAL, DIAZINON 60% w/v EC

Quantity Required:

Specifications

1. Chemical Name:
   diethyl 2-isopropyl-4-methyl-6-pyrimidinyl phosphorothionate

2. Minimum Purity:
   60% w/v

3. Physical Properties:

   3.1 Acidity
   Maximum acidity:
   0.05% calculated as H_2SO_4

   3.2 Water
   Maximum: 0.2%

   3.3 Emulsion stability
   After the best stability test (5.2) the product, when diluted at 30 °C with CIPAC standard water D (342 PPM hardness) shall comply with the following:

Time after dilution	Limit of stability
0h	Initial emulsifiability: Complete
0.5h	Cream: Maximum 1 ml.
2h	Cream: Maximum 4 ml. Free oil: Nil.
24h	Re-emulsification: Complete
24.5h	Cream: Maximum 4 ml. Free oil: Maximum 2 ml.

4. Storage stability:

   4.1 Low temperaure stability
   After storage at 0°C for 7 days the volume of solid or liquid which separates shall be not more than 0.3%

   4.2 Heat stability
   After storage at 54 ± 2°C for 14 days the product sall continue to comply with 2 and 3.3.

Specifications

5. Packing and markings:

5.1 Packings

The material must be packed in suitable, clean containers which do not affect and are not affected by the product contained. The container must adequately protect the produc from extarior influences including moisture contamination and compaction and from loss by vaporization. Where necessary, centainers shall be lined with a suitable material to prevant corrosion or daterioration of contents or container. Outer surface of containers must be so constructed or treated as to prevent corrosion or deterioration of container and of the product labd. Containers must comply with all applicable national and international transportation, safety and other regulations.

The pesticide product, container and contents, must be sufficiently stable to most all product specifications for a period of at least two years.

5.2 Markings

All the packages shall bear durably and legible marked on the containers.

BAN/2KR-4

Item No. PPW-4 AGRO-CHEMICAL, MIPC 75% w/w WP

Quantity Required:

Specifications

1. Chemical Name:
   O-cumenyl methylcarbamate

2. Minimum Purity:
   75% w/w WP

3. Physical Property:

   3.1 Colour/appearance:
   Whity fine power

   3.2 Odour:
   Slightly phenolic

   3.3 Bulk density:
   0.300 - 0.400 mg/ml

   3.4 PH value:
   PH 5.0 - 7.0

   3.5 Water content:
   0.5%

   3.6 Particle size:
   97% up passing through 45 Mm sieve.

4. Storage Stability:

   4.1 Wattability in hard water (342 ppm) at 30°C after 30 minutes
   50% min.

   4.2 High temperature storage stability for 14 days at 54°C + 2°C)
   Not less than 90% active ingredient shall remain

Specifications

5. Packings and Markings

5.1 Packings

The material must be packaged in suitable, clean containers which do not affect, and are not affected by the product contained. The container must adequately protect the product from exterior influences including moisture contamination and compaction and from loss by vaporization. Where necessary, containers shall be lined with a suitable material to prevent corresion or deterioration of contents or container. Outer surface of container must be so constructed or treated as to prevent corrosion or deterioration of container and of the product label. Containers must comply with all applicable national & international transporation safety & other regulations.

The pesticide product, container & contents, must be sufficiently stable to most all product specifications for a period of at least two years.

5.2 Markings

All the packages shall bear durably and legible marked on the containers.

BAN/2KR-5

Item No. MOF-1 AGRO-CHEMICAL, METHYL BROMIDE

Quantity Required:

Specifications

1. Chemical Name:
   bromomethane

2. Physical Property:
   2.1 Appearance
   Colorless mobile liquid
   2.2 Odor
   Similar to that of chloroform or ether
   2.3 Specific Gravity
   Liquid: 1.732 at 0°C
   Gas: 3.28 (Air = 1)
   2.4 Boiling Point
   4.5°C
   2.5 Steam Pressure
   2.0kg/cm^2 at 20°C
   2.6 Solubility
   a) 1.25/100m lit. H_2O (20°C)
   b) Soluble in alchol, ether, chloroform, carbon tetrachloride, benzene, carbon bisultide.

3. Packings and Markings:
   3.1 Packings
   The material must be packed in suitable, clean containers which do not affect and are not affected by the product contained. The container must adequately protect the produc from extarior influences including moisture contamination and compaction and from loss by vaporization. Where necessary, centainers shall be lined with a suitable material to prevent corrosion or daterioration of contents or container. Outer surface of containers must be so constructed or treated as to prevent corrosion or deterioration of container and of the product labed. Containers must comply with all applicable national and international transportation, safety and other regulations.

BAN/2KR-5

Item No. MOF-1 AGRO-CHEMICAL, METHYL BROMIDE

Quantity Required:

Specifications

The pesticide product, container and contents, must be sufficiently stable to most all product specifications for a period of at least two years. Container should be of 50kg capacity of clylinder capable to withstand transit by sea, rail and road.

3.2 Markings

All the packages shall bear durably and legible marked on the containers.

BAN/2KR-6

Item No. BADC-1 DIESEL ENGINE

Quantity Required: 500 sets

Specifications

Description

4 cycle, water cooled diesel
engine for deep tube well
pump applicable to tropical conditions

Performance

1. Output: 36 HP or more at 2200 to 2300rpm
2. Displacement: approx. 2,500cc

Dimensions

1. Overall length: approx. 1200mm
2. Overall width : approx. 530mm
3. Overall height: approx. 1000mm

Dry weight

approx. 400kg

Engine

1. Combustion system:
   direct injection or swirl chamber type
2. Number of cyclinder: 3
3. Cooling system:
   water cooled with radiator for
   tropical conditions
4. Lubricating system:
   forced lubrication by trochoid or gear
   pump
5. Starting system:
   manual or electric motor
6. Air cleaner:
   single paper element type or oil bath
   type
7. Fuel oil filter: paper element type
8. Lubricating oil filter:
   paper element or washable type
9. Instrument panel:
   tachometer with hour meter,
   lubricating oil pressure guage,
   cooling water temperature and others

BAN/2KR-6

Specifications

Clutch

Mechanical type

Accessaries

Base for engine, fuel oil daily service tank, exaust silencer, tool box and tool kit for daily maintenance, and others

BAN/2KR-7

Item No. BADC-2 DEEP TUBE WELL COMMISSIONING MATERIALS

Quantity Required: 500 sets

Specifications

Description

Gear box and spacer shaft for deep tube well commissioning materials

Gear box

1. Type: right angle for pump driver, suitable for 36 HP diesel engine
2. Gear reduction ratio: 3/2
3. Back stop: non reverse, rachet type
4. Lubrication system: water cooled type
5. Dimensions:
   1) Overall length: approx. 300mm
   2) Overall width: approx. 300mm
   3) Overall heigth: approx. 550mm

Spacer shaft

1. Type: universal type suitable for 36 HP engine and gear box
2. Overall length: approx. 600mm

BAN/2KR-8

Item No. BWDB-1 SUBMERSIBLE DEEP TUBE WELL PUMP

Quantity Required: 20 units

Specifications

Description

Electric submersible pump with accessories for deep tube well

Submersible pump

1. Type: submersible multistage turbine pump
2. Discharge volume: 3.4m^3/min or more
3. Total head: 33m or more
4. Revolution: approx. 3,000rpm
5. Number of stages: 2
6. Impeller type: closed type
7. Material:
   1) Casing: cast iton
   2) Impeller: bronze
   3) Pump shaft: stainless steel

Submersible motor

1. Type: water field type
2. Output: 30kW or more
3. Voltage: 400V, 3 phase
4. Frequency: 50 Hz.
5. Starting method: star-delta starting
6. Material:
   1) Motor bracket: cast iron
   2) Motor frame: carbon steel
   3) Motor shaft: stainless steel

Combination starter

1. Type: wall-mounting, outdoor type
2. Equipment:
   1) pilot lamp
   2) volt-meter
   3) ammeter
   4) thermal relay (over-load, single phase protection)
   5) fuse
   6) magnet switch
   7) floatless switch

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Specifications

Standard accessories

1.	Well cover with discharge elbow:	150mm dia.	1 no.
2.	Auto air vent valve:		1 no.
3.	Companion flange:	150mm dia.	1 no.
4.	Sluice valve:	150mm dia.	1 no.
5.	Check valve:	150mm dia.	1 no.
6.	Compound guage:		1 no.
7	Cabtyre cable:	$3.5mm^2$ or more/ 3 cores/40m	2 nos.
8	Riser pipe:	5.5m/no. 150mm dia material, carbon steel	6 nos.
9.	Electrode:	electric wire/40m	1 no.
10.	Cable clip:	150mm dia.	12 nos.

BAN/2KR-9

Item No. BWDB-2 SHEET PILE

Quantity Required: 20 units

Specifications

Description

U type steel sheet piles

Dimensions

1. Effective width:
   400 mm, tolerance +10 mm to - 5 mm
2. Effective height:
   125-130 mm, tolerance ± 4%
3. Thickness:
   13 mm, tolerance ±1.2 mm
4. Overall length:
   12 m, tolerance + unlimited to 0

Dry weight

Approx. 720 kg.

Properties

1. Moment of inertia: 2,300 cm^4 or more per pile
2. Section modulus: 230 cm^3 or more per pile

Steel grades

Steel grades and properties shall meet the following standard:

JIS A5528 SY 30 or equivalent

BAN/2KR-10

Item No.BWDB-3 VIBRATING PILE DRIVING HAMMER

Quantity Required: 2 units

Specifications

Description

Electric-vibrating type, suitable for type III sheet pile(W400mm x H130mm x T13mm), pile driving hammer consisting of vibrator, cabtyre cable & hydraulic hose and controller

Performance

1. Driving
   1) N value: sandy soil; 30 or less clay soil, silty soil; 15 of less
   2) Sheet pile length:
      type III; 15 m long or less
2. Extracting
   Sheet pile length:
   sandy soil type III; 22 m or less
   clay soil, silty soil type III; 15 m or less

Vibrating Unit

1. Vibrator
   1) Motor output: 40kW or more
   2) Eccentric moment:2,200kg-cm or more
   3) Motor voltage: 400V.
   4) Cycle of source: 50 Hz.
   5) Frequency: approx. 1,100 c.p.m.
   6) Vibrating power: 30 ton or more
   7) Theoretical amplitude: approx 7mm
   8) Theoretical acceleration: approx. 10g
2. Damper
   1) Spring solid load: 16 ton or more
   2) Spring stroke: 200mm or more
   3) Spring constant: 60kg/mm or more
3. Chuck
   1) Chucking force: 44 ton or more
   2) Chuck clearance:
      -10mm to 48mm or more

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Specifications

4. Dimensions
   1) Overall length: approx. 3,000mm
   2) Overall width : approx. 1,100mm
   3) Overall depth : approx. 1,000mm
5. Dry weigth
   Approx. 3,600kg

Control Unit

1. Starting system:
   electromagnetic star-delta system
2. Operating position:
   point control and remote control
3. Dry weigth: approx. 450 kg.

Power Source Cable

Section area:
30 mm^2 or more at 400 V.

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Item No. BWDB-4 DIESEL GENERATOR

Quantity Required: 2 units

Specifications

Description

Diesel engine driven
100 KVA or more at output frequency of 50 Hz.
Bonnet type generator

Dimensions

1. Overall length: approx. 3000mm
2. Overall width : approx. 1200mm
3. Overall height: approx. 1700mm

Dry weigth

Approx. 2,450 Kg.

Alternator

1. Stand-by power: 100 KVA or more (50Hz)
2. Prime power : 90 KVA or more (50Hz)
3. Voltage: AC 400 V.
4. Excitation: brushless
5. Power factor: 80% lag.
6. No. of poles: 4 poles

Diesel engine

1. Type: 4 cycle, water cooled,
   direct injection
2. No. of cylinders: 6 cylinders
3. Displacement: approx. 6500cc.
4. Revolutions: 1500rpm.
5. Starting system: electric starting motor
6. Lubricating system: forced lubricating
7. Fuel consumption: 28 lit/h or less

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Item No. BWDB-5 DRAGLINE

Quantity Required: 2 units

Specifications

Description:

Diesel engine driven equipped with 1.2m^3 bucket capacity, 20m boom length. Dragline for the improvement, operation and maintenance of drainage canal.

Dimensions:

Overall height (without boom):	approx. 5,100mm
Radius of rear end:	approx. 4,000mm
Overall length of crawler:	approx. 5,400mm
Overall width:	approx. 3,300mm
Standard boom length:	not less than 9m
Boom extension:	not less than 20m total boom lenght by this extension.

Performance:

1. Dragline bucket capacity:	not less than 1.2m^3
2. Working radius (at boom length 20m, boom angle 45°):	approx. 15m
3. Max. dumping height (20m, 45°):	approx. 11m
4. Max. dumping radius (20m, 45°):	approx. 14m
5. Max. digging depth (15m, 45°):	approx. 4m
6. Line pull:	not less than 10,000kg
7. Line speed:	not less than 25m/min
8. Ground pressure:	approx. 0.55kg/cm^2
9. Gradeability:	40%
10. Travel speed:	approx. 1.3km/h

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Specifications

Engine:

1. Type: water cooled, 4 cycle, 6 cylinder, diesel engine
2. Horse power: not less than 130Hp at rated rpm
3. Max. torque: not less than 50kg.m at rated rpm
4. Displacement: approx. 10,000cc
5. Fuel tank: approx. 250 lit.
6. Battery: 12V x 2, 120AH or more

Upper machinery:

1. Control system: power hydraulic system
2. Clutch: Band type, internal expanding clutch powered by hydraulic cylinder
3. Drums: front and rear main drum, external contracting band brake
4. Boom hoist assembly: spur gear driven independent boom hoist, hydraulically released band type brake
5. Swing speed: approx. 3.5m rpm
6. Cab: full-vision compartment with safty glass panel

Lower machinery:

1. Shoe width: not less than 760mm
2. Track rollers: heat treated
3. Track shoes: heat treated, self-cleaning

BAN/2KR-13

Item No. BWDB-6A BULL DOZER: 200 HP

Quantity Required: 2 units

Specifications

Description

Power Sift Crawler type Tractor for dozing works, driven by not less than 200 flywheel horse power engine, equiped with angledozer and hydrauric control unit.

Performance

1. Max. travel speed
   Forward: Not less than 9.5km/hr
   Reverse: Not less than 11.0km/hr
2. Max. drawbar pull:
   Not less than 38 ton at lowest gear use
3. Operating weight: Not less than 18 ton
4. Ground pressure: Max. 0.80kg/cm^2

Dimension

1. Overall length: approx. 4,200mm
2. Overall width: approx. 2,600mm
3. Overall height: approx. 3,400mm
   (except exhaust pipe, air-cleaner pipe)
4. round contact area: approx. 2.7m^2
5. Ground clearance: approx. 340mm or more
   (except grouser height)

Engine

1. Type:
   Water cooled, 4-cycle, direct injection type, turbocharged diesel engine
2. Displacement:
   More than 10,000cc
3. No. of cylinders:
   6 or more
4. Flywheel horsepower:
   More than 200 HP at rated rpm
5. Max. torque:
   More than 100kg.m
6. Fuel oil:
   Diesel gas oil

Specifications

7. Lubrication system:
   Gear pump, forced lubrication, full-flow type
8. Cooling system:
   Forced circulation water, exhaling fan type
9. Air cleaner: Dry type
10. Starting method:
    24V electric starting motor
11. Battery: 24V more than 170 Ah

Transmitting system

1. Torque converter:
   3 element, single stage and single phase, water cooled
2. Transmission:
   Planetary gear type with 3 forward and 3 reverse speeds
3. Final drive:
   Spur gear, double reduction

Steering system

1. Steering clutch:
   Wet multiple disc, hydrauric disengaged, hand operated
2. Steering brake:
   Wet, contructing band, foot operated, interconnected with steering clutch, with hydrauric booster

Under carriage

1. Suspension:
   Oscillation type with equalizer bar
2. Carrier roller: 2 pcs on each side
3. Track roller: 6 pcs on each side
4. Shoe grouser height: More than 70mm
5. Shoe width: More than 500mm
6. Lubrication: Lubricated tracks
7. Driving sprocket:
   Replacable bolt-on sprocket rim segments

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Specifications

Dozer

1. Type: Hydraulic controled, manual or hydrauric angling and tilting
2. Dimension
   1) Hight: More than 970mm
   2) Length: More than 4,250mm
3. Max. lift above ground: More than 1,180mm
4. Max. digging below ground: More than 470mm
5. Blade angle: 25°

Hydrauric control system

1. Max. hydrauric pump capacity: More than 220 litres/min. at rated rpm
2. Control valve position: Raise, hold, lower and float for bulldozer blade

ROPS Canopy and FOPS

1. ROPS criteria: Shall meet SAE SAEJ395 ISO3471
2. FOPS criteria: Shall meet SAE J231 ISO3449

Other attachment

Shall equiped with Drawbar, vandalism protection and panel cover and lock

Electric equipment

Double head lamps, rear side working lamp, necessary pilot lamps and necessary gauges shall be equipped

BAN/2KR-14

Item No. BWDB-6B BULL DOZER: 90 HP

Quantity Required: 2 units

Specifications

Description

Power Sift Crawler type Tractor for dozing works, driven by 90 or more flywheel horse power engine, equiped with angledozer and hydrauric control unit.

Performance

1. Max. travel speed
   Forward: Not less than 9.0km/hr
   Reverse: Not less than 10.0km/hr
2. Max. drawbar pull:
   Not less than 10 ton at lowest gear use
3. Operating weight:
   Not less than 9.8 ton
4. Ground pressure:
   Max. 0.62kg/cm^2

Dimension

1. Overall length
   (except dozer): approx. 3,400mm
2. Overall width
   (except dozer): approx. 2,000mm
3. Ground contact area: approx. 1.8m^2
4. Ground clearance (except grouser height): approx. 370mm

Engine

1. Type:
   Water cooled, 4-cycle, direct injection type, turbocharged diesel engine
2. Displacement:
   More than 4,300cc
3. No. of cylinders:
   4 or more
4. Flywheel horsepower:
   90 HP or more at rated rpm
5. Fuel oil:
   Diesel gas oil

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Specifications

6. Lubrication system:
   Gear pump, forced lubrication
7. Cooling system:
   Forced circulation water, pusher fan type
8. Air cleaner: Dry type
9. Starting method:
   24V electric starting motor
10. Battery: 24V more than 120 Ah

Transmitting system

1. Torque converter:
   3 element, single stage and single phase
2. Transmission:
   Planetary gear type with 3 forward and 3 reverse speeds
3. Final drive:
   Spur gear, single reduction

Steering system

1. Steering clutch:
   Wet multiple disc, hydrauric disengaged, hand operated
2. Steering brake:
   Wet, contructing band, food operated, interconnected with steering clutch, with hydrauric booster

Under carriage

1. Suspension:
   Oscillation type with equalizer bar
2. Carrier roller: 2 pcs on each side
3. Track roller: 6 or 7 pcs on each side
4. Shoe grouser height: More than 45mm
5. Shoe width: More than 350mm
6. Lubrication: Lubricated tracks
7. Driving sprocket:
   Replacable bolt-on sprocket rim segments

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Specifications

Dozer

1. Type: Hydraulic controled, manual or hydrauric angling and tilting
2. Dimensions
   1) Hight: More than 900mm
   2) Length: More than 2,500mm
3. Max. lift above ground: More than 860mm
4. Max. digging below ground: More than 370mm

Hydrauric control system

Control valve position: Raise, hold, lower and float for bulldozer blade

ROPS Canopy and FOPS

1. ROPS criteria: Shall meet SAE J1040c ISO3471
2. FOPS criteria: Shall meet ISO3449

Other attachment

Shall equiped with Drawbar, vandalism protection and panel cover and lock

Electric equipment

Double head lamps, rear side working lamp, necessary pilot lamps and necessary gauges shall be equipped

BAN/2KR-15

Item No. BWDB-7 PAY LOADER: 70 HP

Quantity Required: 1 unit

Specifications

Description

Four wheel drive type, rubber tyred loader equipped with heavy duty general purpose type straight edge bucket with changeable teeth for dozing, loading, scraping and damping driven by a diesel engine having flywheel horsepower 70 HP or more at rated rpm.

Performance

1. Bucket capacity
   1) SAE heaped: 1.2m^3 or more
   2) Stuck: 0.9m^3 or more
2. Operating weight: 6,400kg or more
3. Static tipping load
   1) Straight: 4,800kg or more
   2) Full turn: 4,200kg or more
4. Breakout force: 6,800kg or more
5. Turning radius: 5,200mm or less

Dimensions

1. Overall length (bucket on ground): approx. 6,000mm
2. Overall height (at exhaust pipe): approx. 3,400mm
3. Overall height (bucket full raise): 4,350mm or more
4. Width over tires: approx. 2,200mm
5. Bucket width: 2,300mm or more
6. Wheel base: approx. 2,500mm
7. Tread: approx. 1,800mm
8. Ground clearance: 290mm or more
9. Dumping clearance: 2,500mm or more at 45° discharge angle
10. Dumping reach: 940mm or more at full lift and 45° discharge angle

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Specifications

Engine

1. Type:
   Water cooled, 4-cycle, over head valve, fuel direct injection type diesel engine
2. No. of cylinders:
   4 or 6 cylinders
3. Flywheel horsepower:
   Not less than 70 HP at rated rpm
4. Fuel system:
   Direct injection system
5. Lubrication system
   1) Lubrication method:
      Gear pump forced lubrication
   2) Lubricating oil filter:
      Full-flow repreaceable paper element filter
   3) Lubricating oil cooler:
      Water cooled
6. Cooling system:
   Forced circulation by centrifugal water pump with pusher type fan
7. Air cleaner:
   Dry type
8. Starting method:
   Electric starting
9. Battery:
   2 x 12 volt

Torque converter

Three-element, single-stage, single-phase type

Transmission

Power shift with torque converter, all wheel drive type.
At least 3 forward and 3 reverse speed.
Driving speed shall not less than 6.5km/h at first gear and not less than 24.5km/h at top gear

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Specifications

Transmission gear

1. Reduction gear:
   Spiral bevel gear type
2. Differencial gear:
   Straight bevel gear type
3. Final reduction gear:
   Planetary gear type

Axles

1. Drive system:
   Four wheel drive type
2. Front:
   Fixed frame
3. Rear:
   Oscillation $\pm 12^{o}$

Wheels

Tubless traction type rubber or nylon tyre of 15.5-24-10 or more

Brakes

1. Service brake:
   Hydraulic actuated disc brake actuate all wheels, two brake pedals, right pedal brakes only, lift pedal brakes while, neutralizing transmission
2. Parking brake:
   Drum and shoe or disc type, applied on front axle pinien shaft or main drive line

Steering

Frame articulating power stearing

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Specifications

Hydraulic system

1. Type:
   Gear pump
2. Control valve:
   Two-way spool type
3. Relief valve setting:
   200kg/cm^2 or more

Loadings mechanizm

Automatic bucket positioner adjustable to desired loading angle and automatic kickout to full lift height to be equipped and pins in lift arms and bucket king points to be sealed pin-type

Service refill capacities

1. Coolig system: approx. 30 lit.
2. Fuel tank: 120 lit. or more

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Item No. BWDB-8 DUMP TRUCK: 10 Ton

Quantity Required: 5 units

Specifications

Description

Forward control 4 x 2 axle configulation, right-hand drive, diesel engine driven rear dump truck having payload capacity of 10 ton or more.

Engine

1. Type:
   Water cooled, 4-cycle, overhead valve, direct fuel injection, in-line diesel engine
2. No. of cylinders
   6 cylinders
3. Flywheel gross output:
   Not less than 150 HP (SAE Gross) at rated rpm
4. Total piston displacement:
   Not less than 6,000cc
5. Fuel system:
   Bosch type direct fuel injection, in-line plunger
6. Lubrication system
   1) Lubrication method:
      Gear pump forced lubrication
   2) Oil filter:
      Full-flow and by-pass type, replaceable paper element filter
   3) Oil cooler
      Water cooled, plate fin type
7. Cooling system:
   Corrugated fin type radiator, forced circulation by centrifugal water pump with suction type fan
8. Air cleaner:
   Replaceable dry paper element type
9. Electrical system:
   24 volt system

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Specifications

Transmission

5 forward and 1 reverse speed, synchromesh gear from 2nd to 5th, floor shift, mechanical direct control with dry single plate mechanically operated clutch.

Chassis

1. Rear axle:
   Full floating type single reduction spiral revel gear or hypoid gear
2. Front axle:
   Reverse Elliot "I" beam type
3. Service brake:
   Hydraulic brake with vacuum assisted, internal expanding two shoe type
4. Parking brake:
   Mechanically operated internal expanding two shoe type on drum at rear of transmission
5. Steering: Standard recirculating ball type
6. Suspension:
   Semi-elliptic leaf springs with shock absorber for front and semi-elliptic leaf springs with auxiliary leaf springs

Wheels and tires

1. Wheels:
   8 stud disc wheels, 20 in. nominal diameter
2. No. of tires: 7 including 1 spare tire

Cab

1. Construction:
   All steel welded construction, tilt type
2. Windshield:
   One piece type with zone tempared safety glass with dual electric windshield wipers
3. Seats:
   Vinyl leather rubber cushoned low back type. Driver's seat to be fully adjustable

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Specifications

Dumping performance

1. Tipping angle:
   Not less than 50°
2. Lifting time:
   Not more than 20 sec
3. Lowering time:
   Not more than 20 sec

Body

1. Type:
   Drop-tailgate type
2. Construction:
   All welded steel construction
3. Body capacity:
   Not less than 4.0 cu.m
4. Thickness of steels
   1) Deck plate:
      Not less than 4.5mm
   2) Side plate:
      Not less than 3.0mm
   3) Tail gate plants:
      Not less than 3.0mm

BAN/2KR-17

Item No. BWDB-9 WELL POINT PUMP

Quantity Required: 10 sets

Specifications

Description

Well point dewatering system, consist of well point; well point pump, jetting pump, pipes and others

Well point pump

1. Component:
   Centrifugal pump, vaccumpump, separator tank, vaccum gauge, check valve, discharge hose, diesel engine and others
   Centrifugal pump, vaccume pump, separator tank and diesel engine shall be mounted on a common fabricated steel bed and set compactly other necessary equipments
2. Centrifugal pump:
   1) Type: horizontal, single stage, centrifugal pump
   2) Capacity: $6m^3/min$ or more
   3) Total head: 17m or more
   4) Materials
      Volute of the pump: cast iron
      Impeller: bronze

Well point

1. Type: self jetting bottom suction type
2. Screen:
   1) Material: stainless steel
   2) Slot size: 0.75mm or less
   3) Length of screen: 650mm or more
   4) Percentag area opening: 10% or more

Jetting pump

1. Type:
   diesel engine driven, horizontal shaft, single suction, vertically split casing, multistage, double volute, centrifugal pump
2. Capacity:
   $50m^3/h$ or more at approx. $13kg/cm^2$
3. Suction dia.: 100mm

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Specifications

4. Discharge dia.: 75mm
5. Jetting hose:
   1) Diameter: 75mm
   2) Type: double jacket, 100% synthetic collapsible type
   3) Operating presure: 17kg/cm^2 or more
   4) Length:
      15m and 30m length with threaded nipple and coupling swivels
      30m 5 pcs.
      15m 5 pcs.
6. Suction:
   100mm heavy duty reinforced, 6m in length with foot valve and strainer

Quantity required of necessary equipments for 10 sets

1.	Well point pump unit	10 sets
2.	Jetting pump unit	2 sets
3.	Well point (2" x 0.7m)	2,000 units
4.	Riser pipe (1-1/2" x 6m)	2,000 units
5.	Compact cock (1-1/2")	2,000 units
6.	L type fitting (1-1/2")	2,000 units
7.	Swing hose	2,000 units
8.	Hose band (for 1-1/2")	4,000 units
9.	Header pipe (10" x 6m)	340 units
10.	Header caupling (10")	400 units
11.	Header tea (10")	10 units
12.	Header elbow (10")	40 units
13.	Header bend (10")	20 units
14.	Header cap (10")	20 units
15.	Gate valve (10")	10 units
16.	Separator tank	10 units
17.	Notch tank	10 units

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Item No. BWDB-10 BAR CUTTER

Quantity Required: 1 unit

Specifications

Description

Motor driven, steel bar for concreat reinforcement cutter

Cutting capacity

1. 32mm dia. or more at 45kg/mm^2
2. 28mm dia. or more at 65kg/mm^2

Electric motor output

1.5kW or more

Dimensions

1. Overall length: approx. 600mm
2. Overall width: approx. 500mm
3. Overall height: approx. 900mm

Dry weight

Approx. 400kg

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Item No. BWDB-11 PIPE CUTTER

Quantity Required: 1 unit

Specifications

Description

Remote controlled, gas auto pipe cutting machine

Effective pipe diameter and thickness

1. Diameter: 150mm dia. to 600mm dia.
2. Thickness: 5 to 50mm

Power source

20W, 230V, 50Hz, single phase

Dimensions

1. Length: approx. 270mm
2. Wheel track: approx. 230mm
3. Height: approx. 420mm

Dry weight

Approx. 15kg

Cutting speed

Approx. 100 to 700mm/min.

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Item No. BWDB-12A PIPE BENDER

Quantity Required: 1 unit

Specifications

Description

Motor driven, hydroulic pipe bender

Bending capacity

318.5mm (O.D.) x 6.9mm (thickness) or less

Bending method

Segment (0 to 90 degree)

Bending speed

Approx. 110mm/min

Return speed

Approx. 500mm/min

Dimensions

1. Overall length: approx. 4100mm
2. Overall width: approx. 3200mm
3. Overall height: approx. 1100mm

Dry weight

Approx. 3,600kg

Power source

3.7kW, 400V, 50Hz, 3-phase

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Item No. BWDB-12B BAR BENDER

Quantity Required: 1 unit

Specifications

Description

Bar bender for motor diver, steel bar for concreat reinforcement

Bending capacity

1. 25mm dia. or more at high speed rpm (10rpm)
2. 32mm dia. or more at low speed rpm (6.6rpm)

Power source

2.2kW, 400V, 50Hz, 3-phase

Dimensions

1. Overall length: approx. 1,000mm
2. Overall width: approx. 900mm
3. Overall height: approx. 900mm

Dry weight

Approx. 500kg

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Item No. BWDB-13 CRANE

Quantity Required: 1 unit

Specifications

Description

Rail mounted, 5 ton rated capacity, gantly crane

Capacity

5 ton or more

Lift

12m or more

Rail span and size

1. Span: 30m or more
2. Size: 30kg/m or more
3. Travelig distance: 50m

Wheels

1. No. of wheels: 4
2. Dia. of wheels: approx. 400mm dia.
3. Wheel base: approx. 9,000mm
4. Wheel load: 10t/wheel or more

Motion

1. Main host:
   1) Speed: 5m/min or more
   2) Motor: 5kW or more, 400V, 50Hz, 3-phase
   3) Brake: magnet
2. Cross Travel
   1) Speed: 16m/min or more
   2) Motor: 0.3kW x 2 or more, 400V, 50Hz, 3-phase
   3) Brake: magnet
3. Long travel
   1) Speed: 16m/min or more
   2) Motor: 1.9kW x 2 or more, 400V, 50Hz, 3-phase
   3) Brake: magnet

BAN/2KR-23

Item No. BWDB-14 GUS CUTTING MACHINE

Quantity Required: 1 set

Specifications

Description

Gus cutting and welding machine consist of following equipments

1.	Torch:	
	1) Torch handle	1
	2) Cutting attachment	1
	3) Welding mixer	1
2.	Regulators:	
	1) Oxygen regulator	1
	2) Acetylene regulator	1
3.	Cutting tip:	
	1) for plate thickness 15-30mm	1
	2) for plate thickness 50-100mm	1
4.	Welding nozzle:	
	1) for plate thickness 9-15mm	1
	2) for plate thickness 15-25mm	1
	3) for plate thickness 25-35mm	1
5.	Twin hose: for oxgen and acetylene 7.5m long with fitting	1
6.	Igniter:	1
7.	Wrech:	1
8.	Tip cleaner:	1
9.	Gogg les:	1

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Item No. BWDB-15 ARC WELDING MACHINE

Quantity Required: 1 set

Specifications

Description

AC arc welding machine with accessaries

Arc welder

1. Secondary current: 400 amp.
2. Primary input: approx. 33kVA (approx. 19kW)
3. Secondary current range: 50-400 amp.
4. Duty cycle: 40%
5. Electrode size: 2.6 to 8mm
6. Dimensions:
   1) Overall width: approx. 450mm
   2) Overall depth: approx. 650mm
   3) Overall height: approx. 800mm
7. Dry weight: approx. 150kg
8. Power source: 50Hz, 400V

Accessaries

1.	Leather gloves	5
2.	Welding shied	1
3.	Safety holder	1
4.	Earth clip	1
5.	Secondary cord	1
6.	Double-end chipping hammer	1

BAN/2KR-25

Item No. MOF-1	TRUCK: 7 TON
Quantity Required:	40 units

Specifications

Description

Forward control 4 x 2 axle configuration, right-hand drive, diesel engine driven truck having payload capacity of 7 ton or more.

Engine

1. Type:
   Water cooled, 4-cycle, overhead valve, direct fuel injection, in-line diesel engine
2. No. of cylinders
   6 cylinders
3. Flywheel gross output:
   approx. 160 Hp at rated rpm
4. Max torque: at rated rpm approx. 45kg·m
5. Total piston displacement:
   approx. 1,500cc
6. Fuel system:
   Bosch type direct fuel injection, in-line plunger, with mechanical governor
7. Lubrication system:
   1) Lubrication method:
      Gear pump forced lubrication
   2) Oil filter:
      Full-flow type, replaceable paper element filter
8. Cooling system:
   Corrugated fin type radiator, forced circulation by centrifugal water pump with suction type fan
9. Air cleaner:
   Replaceable dry paper element type
10. Electrical system:
    24 volt system

BAN/2KR-25

Specifications

Transmission

5 forward and 1 reverse speed, synchromesh gear from 2nd to 5 or 6th, floor shift, mechanical direct control with dry single plate mechanically operated clutch.

Chassis

1. Rear axle:
   Full floating type single reduction spiral bevel gear
2. Front axle:
   Reverse Elliot "I" beam type
3. Service brake:
   Hydraulic brake with two leading shoes for front and rear
4. Parking brake:
   Mechanical, internal expanding, acting on transmission
5. Steering:
   Standard recirculating ball type
6. Suspension:
   1) Front: Semi-elliptic leaf springs with double acting shock absorbers
   2) Rear: Semi-elliptic main and auxillary leaf springs

Wheels and tires

No. of tires:
7 including 1 spare tire

Cab

1. Construction:
   All steel welded construction
2. Windshield:
   One piece type with zone tempered safety glass with dual electric windshield wipers
3. Seats:
   Urethane foam pads in seat cushion and backrest with reclining seat

BAN/2KR-25

Specifications

Loady deck dimensions

1. Inside length: approx. 5,300mm
2. Inside width: approx. 2,300mm

BAN/2KR-26

Item No. MOF-2 MOISTURE METER

Quantity Required: 500 units

Specifications

Description

Electric resistance method, digital display moisture meter applicable to Bangladeshi grain moisture condition

Applications

Aman paddy, Boro paddy, Aus paddy
Soft wheat, Hard wheat, Boiled rice, Indica raw rice
Grains' moisture content shall be measured directly or by conversion chart

Measuring range

1. Paddy: 10 to 30%
2. Rice: 10 to 20%

Measuring accuracy

±0.5%

Temparature compensation

Automatic

Power source

Battery, 1.5V x 4 pcx.

Dimensions

1. Overall length: approx. 160mm
2. Overall width: approx. 90mm
3. Overall height: approx. 60mm

Dry weight

Approx. 700g

Accessories

1. Sampling tray: 2 pcs.
2. Brush: 1 pc.
3. Rice huskor 1 pc.
4. Tweezers: 1 pc.

BAN/2KR-27

Item No. MOF-3 GRAIN DRYER

Quantity Required: 10 units

Specifications

Description

Flat type, engine driven grain dryer with holding capacity of 1.2 ton or more

Power Source

Diesel engine: 2.5 HP or more

Performance

Wind volume: approx. $1m^3/s$ or more

Static pressure: 20mm Aq or more

Drying speed: 0.7%/h or more

Components

1.	Drying box	1
2.	Fan with furnance	1
3.	Diesel engine	1
4.	Fuel tank (approx. 20 lit.)	1

Dimensions

1. Inside length: approx. 3,000mm
2. Inside width: approx. 1,700mm
3. Overall depth: approx. 900mm
4. Inside depth: approx. 450mm

BAN/2KR-28

Item No. FP-1 DREDGER

Quantity Required: 4 units

Specifications

Description

Small and pull type dredger for canal excavating

Performance

1. Delivery capacity: 500m^3/h or more at clean water
2. Total head: 30m or more
3. Delivery distance: 300m or more
4. Excavation depth: 4m or more
5. Excavation width: 10m or more

Dimensions

1. Overall length: approx. 16.0m
2. Breadth: approx. 5.0m
3. Height (except spud): approx. 4.0m
4. Draft: approx. 1.0m

Engine

1. Type:
   4 cycle, water cooled, over head valve, direct fuel injection, turbocharged diesel engine
2. Displacement: approx. 10,000cc
3. No. of cylinders: 6 cylinders or more
4. Horsepower: 220Hp at rated rpm
5. Fuel oil: diesel gas oil
6. Cooling system:
   water cooled forced circulation
7. Battery: 24V, 150AH or more

BAN/2KR-28

Specifications

Sand pump

1. Type: centrifugal, single suction volute pump
2. Diameter:
   1) Suction: 250mm dia.
   2) Delivery: 200mm dia.
3. Delivery capacity: 500m^3/h or more
4. Total head: 30m or more

Cutter device

1. Type: helical crown type or equivalent
2. Driving method: hydraulic motor
3. Rotation: 0 to approx. 25rpm
4. Dredging power: 900kg-m or more
5. Swing: hydraulic
6. Hydraulic oil tank cpacity: approx. 140 lit.

Spud

1. Diameter: approx. 220mm
2. Length: approx. 6m
3. No. of spud: 2 or more

Fuel tank capacity

Approx. 100 lit.

BAN/2KR-29

Item No. FP-2 TAG BOAT

Quantity Required: 4 units

Specifications

Description

Tag and anchor boat for dredger and floating pump equipped with 3 ton crane and repair equipments

Dimensions

1. Overall length: approx. 11.0m
2. Breadth: approx. 4.0m
3. Depth: approx. 1.5m
4. Draft: approx. 1.0m

Outline

1. Type of ship:
   flush decker, fore cabin, aft engine
2. Complement: 3 crews or more
3. Fuel oil tank: 1.0m^3 or more

Engine

1. Type:
   4 cycle, water cooled, diesel engine
2. No. of engines: 1 or 2
3. Total engine output:
   150Hp or more at rated rpm
4. Starting sytem: battery

Speed

1. Maximum speed: 6.5 knots or more
2. Service speed: 6.0 knots or more

BAN/2KR-29

Specifications

Equipments for repair work

1.	Steel locker	1 unit
2.	A.C arc welding machine (300A)	1 set
3.	Grinder (250mm dia.)	1 unit
4.	Gas cutting and welding machine	1 set
5.	Work table	1 unit
6.	Machinist's hand tool	1 set
7.	Electrician's hand tool	1 set
8.	Measuring instruments	1 set

Winch

1.	Type:	single cylinder
2.	Capacity:	3.0 ton or more
3.	Speed:	0 to 20m/min

BAN/2KR-30

Item No. FP-3 INSPECTION BOAT

Quantity Required: 4 units

Specifications

Description

Outboard engine type or inboard engine out drive type, FRP boat

FRP boat

1. Dimensions:
   1) Overall length: approx. 5.0m
   2) Overall breadth: approx. 2.0m
   3) Overall depth: approx. 1.0m
2. Complement: 6 persons or more

Engine

Outboard engine or inboard engine will be equipped

1. Outboard engine
   1) Type: 2 cycle, twin, gas/oil mixture engine
   2) Output: 40 to 55Hp at rated rpm
   3) Displacement: approx. 750cc
   4) Tilting position: 5
   5) Starting system: electric
   6) Control: foward, neutral, reverse
   7) Fuel tank capacity: approx. 25 lit.
2. Inboard engine
   1) Type: 4 cycle, water cooled diesel engine
   2) Output: 40Hp or more at rating rpm (continuous rating)
   3) Displacement: approx. 1,600cc
   4) Tilting system: electric hydraulic power tilt up type
   5) Starting system: electric, battery (12V-120AH or more)

BAN/2KR-31

Item No. FP-4 JEEP

Quantity Required: 4 units

Specifications

Description

The vehicle shall be of 4 x 4 axle configuration wagon, heavy duty suspension and shock absorbers, with mud guards and P.T.O. driven winch

Performance

Maxiumum speed shall be not less than 110 km/h
Maximum gradeability shall be not less than 35 deg.

Engine

1. Type:
   Water Cooled, 4-cycle, overhead valve, diesel engine
2. No. of cylinder:
   4 cylinders in-line
3. Displacement:
   Approx. 2,300cc
4. Flywheel horse power:
   Not less than 65Hp (SAE Gross) at rated RPM
5. Fuel system:
   Direct injection type
6. Lubrication system:
   Lubrication method:
   Gear pump forced lubrication
   Filter:
   Full-flow cartridge type oil filter
7. Cooling system:
   Forced circulation by centrifugal water pump with thermostat and belt driven suction fan
8. Air Cleaner:
   Replaceable paper element type air cleaner

BAN/2KR-31

Specifications

Transmission

1. Manual, 5-speed gearbox
2. Auxiliary box with high & low ratios controlled from the cabin
3. Rear wheel drive with part-time transfer gear
4. Floor shift control

Steering

Right hand driving, steering lock

Brakes

1. Hydraulic on all four wheels, disc brake on front
2. Mechanical parking brakes capable of locking the wheels on a gradient of 20% with load

Wheels & tyres

1. All tyres are interchangeable
2. Mounted spare wheel with tyre and tube
3. Tyre Rib & Lug

Electrical system

1. Head light lamps
2. Directional signals front and rear
3. Illuminated instrument panel
4. Stop and tail light assemble
5. Cab interior light
6. Hazard Switch and fog lamps

Cab & body

1. Accommodating capacity:
   8 passengers and driver in the cab
2. Seats upholstered cushions with springs and covered with durable water proof material
3. Rear view mirror, rear view glass, door mirrors
4. Wagon type body all steel construction

BAN/2KR-32

Item No. FP-5A FLOATING PUMP (12.5 CUSEC TH 15m)

Quantity Required: 2 units

Specifications

Description

Floating type pump station equipped with pump, diesel engine, barge and others

Dimensions

1. Length of barge: approx. 6.0m
2. Breadth of barge: approx. 4.5m
3. Depth of barge: approx. 1.0m
4. Draft of barge: approx. 0.7m
5. Height of awning: approx. 2.0m

Outline

1. Type of barge:
   flush decker, pontoon type
2. Type of upper:
   steel pipe construction with awning structure
3. Deadweight: approx. 1.5t
4. Fuel oil tank: approx. $1.2m^3$
5. Hull structure: mild steel

Piping system on barge

1. Type of piping: one line system
2. Material of pipe: steel pipe or FRP
3. Pipe diameter: approx. 400mm in delivery line
4. Type of valve: butterfly valve, manual operation and check valve
5. Type of joining: steel or FRP flange
6. Connecting piece: flexible rubber joint

BAN/2KR-32

Specifications

Pump

1. Type:
   diesel engine driven, horizontal type,
   double suction volute pump
2. Material of pump:
   1) Casing: F.C (grey iron casting)
   2) Impeller: B.C (bronze casting)
3. No. of pump: 1 set
4. Pump capacity: 12.5 cfs
   (1,275 cub.m/hr)
5. Total head: 15m or more
6. Priming system: Vaccum pump

Engine

1. Type of engine:
   4-cycle, water cooled diesel engine
2. Engine output:
   100Hp or more at rated rpm
3. Starting system: Battery

Hull Outfitting

1.	Anchor:	4 sets
2.	Rope:	4 sets
3.	Bitt:	4 sets
4.	Tire fender:	2 sets

Machinery Outfitting

1.	Steel rack:	1 set
2.	Instrument panel:	1 set
3.	Fuel oil pipe:	1 line

BAN/2KR-33

Item No. FP-5B FLOATING PUMP (12.5 CUSEC TH 9m)

Quantity Required: 4 units

Specifications

Description

Floating type pump station equipped with pump, diesel engine, barge and others

Dimensions

1. Length of barge: approx. 6.0m
2. Breadth of barge: approx. 4.5m
3. Depth of barge: approx. 1.0m
4. Draft of barge: approx. 0.6m
5. Height of awning: approx. 2.0m

Outline

1. Type of barge:
   flush decker, pontoon type
2. Type of upper:
   steel pipe construction with awning structure
3. Deadweight: approx. 1.5t
4. Fuel oil tank: approx. $0.8m^3$
5. Hull structure: mild steel

Piping system on barge

1. Type of piping: one line system
2. Material of pipe: steel pipe or FRP
3. Pipe diameter: approx. 400mm in delivery line
4. Type of valve: butterfly valve, manual operation and check valve
5. Type of joining: steel or FRP flange
6. Connecting piece: flexible rubber joint

BAN/2KR-33

Specifications

Pump

1. Type:
   diesel engine driven, horizontal type,
   double suction volute pump
2. Material of pump:
   1) Casing: F.C (grey iron casting)
   2) Impeller: B.C (bronze casting)
3. No. of pump: 1 set
4. Pump capacity: 12.5 cfs
   (1,275 cub.m/hr)
5. Total head: 9m or more
6. Priming system: Vaccum pump

Engine

1. Type of engine:
   4-cycle, water cooled diesel engine
2. Engine output:
   60Hp or more at rated rpm
3. Starting system: Battery

Hull Outfitting

1.	Anchor:	4 sets
2.	Rope:	4 sets
3.	Bitt:	4 sets
4.	Tire fender:	2 sets

Machinery Outfitting

1.	Steel rack:	1 set
2.	Instrument panel:	1 set
3.	Fuel oil pipe:	1 line

BAN/2KR-34

Item No. FP-5C FLOATING PUMP (25.0 CUSEC TH 9m)

Quantity Required: 3 units

Specifications

Description

Floating type pump station equipped with pump, diesel engine, barge and others

Dimensions

1. Length of barge: approx. 7.0m
2. Breadth of barge: approx. 5.0m
3. Depth of barge: approx. 1.0m
4. Draft of barge: approx. 0.7m
5. Height of awning: approx. 2.0m

Outline

1. Type of barge:
   flush decker, pontoon type
2. Type of upper:
   steel pipe construction with awning structure
3. Deadweight: approx. 2.5t
4. Fuel oil tank: approx. 1.5m^3
5. Hull structure: mild steel

Piping system on barge

1. Type of piping: one line system
2. Material of pipe: steel pipe or FRP
3. Pipe diameter: approx. 600mm in delivery line
4. Type of valve: butterfly valve, manual operation and check valve
5. Type of joining: steel or FRP flange
6. Connecting piece: flexible rubber joint

BAN/2KR-34

Specifications

Pump

1. Type:
   diesel engine driven, horizontal type,
   double suction volute pump
2. Material of pump:
   1) Casing: F.C (grey iron casting)
   2) Impeller: B.C (bronze casting)
3. No. of pump: 1 set
4. Pump capacity: 25.0 cfs
   (2,550 cub.m/hr)
5. Total head: 9m or more
6. Priming system: Vaccum pump

Engine

1. Type of engine:
   4-cycle, water cooled diesel engine
2. Engine output:
   120Hp or more at rated rpm
3. Starting system: Battery

Hull Outfitting

1.	Anchor:	4 sets
2.	Rope:	4 sets
3.	Bitt:	4 sets
4.	Tire fender:	2 sets

Machinery Outfitting

1.	Steel rack:	1 set
2.	Instrument panel:	1 set
3.	Fuel oil pipe:	1 line

BAN/2KR-35

Item No. FP-5D FLOATING PUMP (1 CUSEC)

Quantity Required: 6 units

Specifications

Description

Floating and truck mounted type pump station equipped with pump, diesel engine, barge and others

Dimensions

1. Length of barge: approx. 3.0m
2. Breadth of barge: approx. 1.5m
3. Depth of barge: approx. 0.5m
4. Draft of barge: approx. 0.3m

Outline

1. Type of barge:
   2 floater pontoon, removable type
2. Hull structure:
   mild steel and polypropylene

Piping system on barge

1. Type of piping: one line system
2. Material of pipe: flexible pipe or FRP pipe
3. Pipe diameter: approx. 125mm in delivery line
4. Connecting piece: flexible joint

Pump

1. Type:
   diesel engine driven single double suction volute pump
2. Material of pump:
   1) Casing: F.C (grey iron casting)
   2) Impeller: B.C (bronze casting)
3. No. of pump: 1 set
4. Pump capacity: 1 cfs (1,700 lit/min.)
5. Total head: 9m or more

BAN/2KR-35

Specifications

Engine

1. Type of engine:
   4-cycle, water cooled diesel engine
2. Engine output:
   approx. 10Hp at rated rpm
3. Starting system: Battery

BAN/2KR-36

Item No. FP-6A FRP PIPE (400mm)

Quantity Required: 710m

Specifications

Description

Fiberglass reinforced plastic pipe with coupling

Dimensions

1. Nominal dia.: 400mm
2. Thickness: 7mm
3. Effective length: 4m

Physical characteristics

1. Specific gravity: approx. 1.8
2. Tensile strength: approx. 2,500kgf/cm^2
3. Coefficient of linear thermal expansion, axle: approx. 1.1 x 10^{-5} lit./^oC
4. Specific heat: approx. 0.2 kcal/kg ^oC
5. Thermal conductivity: approx. 0.4 kcal/m.hr. ^oC

BAN/2KR-37

Item No. FP-6B	FRPM PIPE (400mm)
Quantity Required:	20m

Specifications

Description

Fiberglass reinforced plastic mortar pipe with coupling

Dimensions

1. Nominal dia.: 400mm
2. Thickness: 9mm
3. Effective length: 4m

Water pressure for testing

14kg.f/cm^2 or more

BAN/2KR-38

Item No. FP-6C FRP PIPE (600mm)

Quantity Required: 150m

Specifications

Description

Fiberglass reinforced plastic pipe with coupling

Dimensions

1. Nominal dia.: 600mm
2. Thickness: 8mm
3. Effective length: 4m

Physical characteristics

1. Specific gravity: approx. 1.8
2. Tensile strength: approx. 2,500kgf/cm^2
3. Coefficient of linear thermal expansion, axle: approx. 1.1 x 10^{-5} lit./^oC
4. Specific heat: approx. 0.2 kcal/kg ^oC
5. Thermal conductivity: approx. 0.4 kcal/m.hr. ^oC