

NORTH SINAI DEVELOPMENT PROJECT

**CONVEYANCE SYSTEM OF
EL SHEIKH GABER EL SABBAAH CANAL
BETWEEN KM 108.466 AND KM 118.560
EL SALAAM NO.7 (BIR EL ABD) PUMPING STATION**

TENDER DOCUMENTS

VOLUME II

**PART II
SCHEDULE OF TECHNICAL DATA**

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**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Fabrication of Steel Pipe**

1. **Name of manufacturer:** -----
 2. **Location of factory:** -----
 3. **Specification of steel pipe to be fabricated at factory** -----
 - Internal diameter: -----
 - Length of the pipe: -----
 - Welding method and shape: -----
 4. **High silicon cast iron anode:** -----
 5. **Numbers of Qualified Welders:** -----
 6. **Production capacity of the pipe per day and month:** -----
 7. **Hauling method:** -----
-

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6. **Production capacity of the pipe per day and month:** -----
7. **Hauling method:** -----

Signature : -----

Date : -----

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Screens**

1. Weed screen.

- Maker's Name
- Material
- Dimensions
 - a. Width m
 - b. Length m
- Slope Degree
- Cross section :
 - a. Intermediate bars mm
 - b. End bars mm
- Spacing between bars mm
- Particulars of weed collecting device

2. Guard screen.

- Maker's Name
- Material
- Dimensions
 - a. Width m
 - b. Length m
- Slope Degree
- Cross section :
 - a. Intermediate bars mm
 - b. End bars mm
- Spacing between bars mm

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Suction Pipes**

1. Velocity

- Velocity at pump suction nozzle m/sec.
- Velocity variation from inlet of suction pipe to pump suction nozzle.
.....m/sec

2. Suction pipes

- Maker's Name
- Material
- Length m
- Internal diameter mm
- Thickness mm

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)**

Main Pumps

1. Maker's Name	.....	m/sec.
2. Type	.....
3. Standard specification	.....
4. Design Data		
- Rated capacity	.....	m ³ /sec.
- Rated Total Head	.....	m
- Rated Actual Head	.....	m
- All losses to be considered	.....	m
- Pipe line losses	.....	m
- Pump station internal losses	.....	m
- Weed screen losses	.....	m
- Guard screen losses	.....	m
- Shut-off head	.....	m
- Pump efficiency	.....	%
- NPSH palnt	.....	m
- NPSH pump	.....	m
- Maximum brake power input to the pump over the total range of operating head	.....	kW
- Recommended motor power	.....	kW
- Hydraulic pump thrust including total weight of the rotating parts of the pump.		
Max/Nor	.....	Tons
- Outside diameter of the impeller	.....	mm
- Pump shaft diameter	.....	mm
- Intermediate shaft diameter	.....	mm
- Clearance between impeller and casing wearing ring	.....	mm
- Diameter of the pump casing cover	.....	mm
- Offset of discharge from centerline of casing	.....	mm
- Moment of inertia for pump rotating parts	.....	ton * m ²
- Heaviest assemble parts to be handled by the crane		
(Part Name = )	.....	tons
- Maximum reverse speed due to power interruption	.....	rpm
- Maximum value of hydraulic uplifted force including pump rotating parts at any phase of pump operation including start up and shut down	.....	tons
5. Expected pump performance curves showing head, efficiency Power, NPSH versus flow throughout the entire range.		
- Drawing No as attached	.....
6. Medium handled		
- Operating temperature	.....	°C
- Density	.....	kg/m ³
7. Casing construction	.....
8. Impeller construction	.....

Main Pumps (con'd)

- 9. Guide bearing
 - No
 - Type
 - Method of lubrication
 - Method of cooling
- 10. Thrust bearing
 - Type
 - Arrangement
 - Method of lubrication
 - Method of cooling
- 11. Intermediate bearing
 - No
 - Type
 - Method of lubrication
 - Method of cooling
- 12. Coupling within the pump
 - No
 - Type
- 13. Shaft seals
 - Type
 - Maker's Name
 - Lubrication
- 14. Materials
 - Impeller
 - Impeller wearing ring / casing wearing ring
 - Diffuser ring
 - Casing
 - Suction tube liner
 - Casing extension
 - Pump shaft and intermediate shaft
 - Casing cover
 - Bearing box
 - Cooling coil
- 15. Oil lubrication (for Radial bearing / Intermediate shaft bearing)
 - Type
 - Lubricant
 - Quantity / pump Lit/Hr
 - Capacity of oil reservoir Lit
- 16. Velocity at pump suction nozzle m/sec.

I/We guarantee the information given above for the equipment offered.

Signature:
Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Discharge Valves**

- Maker's Name
- Type
- Diameter mm
- Rated pressure bar
- Standard specification
- Actuator
 - a. Maker's Name
 - b. Type (Hydraulic power / Electrical)
 - c. Motor rating kW
 - d. Open and/or closing time sec.
- Materials
 - a. Body
 - b. Shaft
 - c. Disc
 - d. Body sheet
- Testing and Inspection
 - a. Body test pressure Bar
 - b. Seat test pressure Bar

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Isolating Valves**

- Maker's Name
- Type
- Diameter mm
- Rated pressure bar
- Standard specification
- Actuator
 - a. Maker's Name
 - b. Type (Hydraulic power / Electrical)
 - c. Motor rating kW
 - d. Open and/or closing time sec.
- Materials
 - a. Body
 - b. Shaft
 - c. Disc
 - d. Body sheet
- Testing and Inspection
 - a. Body test pressure Bar
 - b. Seat test pressure Bar

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Pipeline Valves**

- Maker's Name
- Type
- Diameter mm
- Rated pressure bar
- Standard specification
- Actuator
- a. Maker's Name
- b. Type (Hydraulic power / Electrical)
- c. Motor rating kW
- d. Open and/or closing time sec.
- Materials
- a. Body
- b. Shaft
- c. Disc
- d. Body sheet
- Testing and Inspection
- a. Body test pressure Bar
- b. Seat test pressure Bar

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Discharge Pipe and Appurtenance**

A. Discharge pipes

- Velocity at discharge pipe m/sec.
- Expansion joint
- a. Maker's Name
- b. Type
- c. Nominal diameter mm
- d. Nominal / Test pressure Bar
- Discharge pipe
- a. Maker's Name
- b. Material
- c. Length m
- d. Internal diameter mm
- e. Thickness mm
- f. Inspection to be applied

B. Header pipe

- Max velocity at Main header pipe m/sec
- Header Pipe
- a. Maker's Name
- b. Material
- c. Length m
- d. Diameter m
- Nozzle size
- a. Connecting to the pump mm
- b. Connecting to the delivery pipe mm
- Thickness
- a. Main header pipe mm
- b. Branch to the pump mm
- c. Branch to the delivery pipe mm
- Inspection to be applied

Discharge Pipe and Appurtenance (con'd)

C. Delivery pipe

- Velocity at deloverry pipe m/sec.
- Expansion joint
- a. Maker's Name
- b. Type
- c. Nominal diameter mm
- d. Nominal / Test pressure Bar
- Flexible joint
- a. Maker's Name
- b. Type
- c. Nominal diameter mm
- d. Nominal / Test pressure Bar
- Delivery pipe
- a. Maker's Name
- b. Material
- c. Length m
- d. Internal diameter mm
- e. Thickness mm
- f. Inspection to be applied
- Water hammer devices : Particulars

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Gates, Stoplog and Accessories**

A. Bulkhead gate

1. Gates

- Maker's Name
- Type of gate
- Dimension of gatem x m
- Material
- Thickness of skin plate mm
- Water tight strips between
 - a. Gate / Grooves
 - b. Gate / sills
- Operating devices
 - a. Maker's Name
 - b. Type
 - c. Motor rating kW
 - d. Open and/or closing time sec.
- Method of storage

2. Grooves and sills

- Maker's Name
- Material

B. Stoplog

1. Gates

- Maker's Name
- Dimension of gatem x m
- Material
- Thickness of skin plate mm
- Water tight strips between
 - c. Gate / Grooves
 - d. Gate / sills
- Operating devices
 - a. Maker's Name
 - b. Type

Gates, Stoplog and Accessories (con'd)

- c. Motor rating kW
- Method of storage
- Dimension of gate m × m

2. Grooves and Sills

- Maker's Name
- Material

C. Gantry Crane

- Maker's Name
- Hoisting capacity tons
- Speed
- a. Lifting m/min
- b. Traverse m/min
- c. Travel m/min
- Span m
- Power kW
- Type of protection IP

D. Roller Gates

1. Gates

- Maker's Name
- Type of gate
- Dimension of gatem x m
- Material
- Thickness of skin plate mm
- Water tight strips between

e. Gate / Grooves

f. Gate / sills

- Operating devices

a. Maker's Name

b. Type

c. Motor rating kW

d. Open and/or closing time sec.

- Method of storage

2. Grooves and sills

- Maker's Name
- Material

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Trash Removal Equipment**

- Maker's Name	.....
- Type and Number	.....	set
- Duty	.....
- Pulling force while lifting	.....	kg
- Scoop lifting height	.....	m
- Weight of the machine	.....	kg
- Speed of the scoop lifting (lowering)	.....	m/min
- Machine travelling speed	.....	m/min
- Scoop length	.....	m
- Scoop holding capacity by volume/weight	.....	m ³ / kg
- Scoop opening / closing time	.....	sec.
- Scoop opening angle	.....	Degree
- Machine overall dimension (width × Breadth × height)	.....	m
- Type of control : Local / From the pumping station	.....
	

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Dewatering Pumps**

- Maker's Name	.....
- Type and Number	.....	sets
- Speed	.....	rpm
- Capacity	.....	m ³ /min
- Manometric head	.....	m
- Max power absorbed by pump	.....	kW
- Motor		
a. Maker's Name	.....
b. Type	.....
c. Design, Type of protection	.....
d. Rated output	.....	kW
e. Speed / Frequency	.....	rpm, Hz
f. Voltage	.....	V
g. Starting / Normal current	.....	A

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Water Filling Pumps

- Maker's Name	.....
- Type and Number	.....	sets
- Speed	.....	rpm
- Capacity	.....	m ³ /min
- Manometric head	.....	m
- Max power absorbed by pump	.....	kW
- Motor		
a. Maker's Name	.....
b. Type	.....
c. Design, Type of protection	.....
d. Rated output	.....	kW
e. Speed / Frequency	.....	rpm, Hz
f. Voltage	.....	V
g. Starting / Normal current	.....	A

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Overhead Traveling Crane**

- Maker's Name	.....
- Type and Number	.....	set
- Lifting capacity (Main / Aux.)	.....	ton
- Weight of heaviest part to be lifted	.....	tons
- Speed		
a. Hoisting speed (Normal)	.....	m/min
b. Trolley speed (Normal)	.....	m/min
c. Girder speed (Normal)	.....	m/min
- Lifting height	.....	m
- Span between Track rails	.....	m
- Length of rails	.....	m
- Lifting wire		
a. Material	.....
b. Max. working load	.....	kg
c. Breaking load	.....	kg
- Bridge Girder		
a. Type	.....
b. Span	.....	m
c. Maximum working load	.....	kg
d. Maximum allowable working stress	.....	kg/cm ²
e. Maximum breaking stress of material	.....	kg/cm ²
f. Maximum deflection	.....	mm

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Lubricants**

- Lubricating
 - a. Brand
 - b. Purpose
 - c. Characteristics
- Greases
 - a. Purpose
 - b. Characteristics

I/We guarantee the information given above for the equipment offered.

Signature:
Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Main Motors**

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Rated voltage	.....	kV
- Rated current	.....	A
- Rated output	.....	MW
- Phase	.....
- Number of poles	.....	Poles
- Method of cooling	.....
- Insulation class	.....
- Locked rotor current at rated volts and frequency	.....	A
- Maximum temperature rise at rated output continuously, rated voltage, frequency and power factor above 45°C ambient temperature.		
a. Armature	.....	°C
b. Field windings	.....	°C
- Efficiency		
at 100% rated output	.....	%
at 75% rated output	.....	%
at 50% rated output	.....	%
at 25% rated output	.....	%

A. Construction

- Material of body	.....
- Thickness of body	.....	mm
- Total weight of Motor	.....	ton
- Approximate overall length of motor	.....	mm
- Approximate overall width of motor	.....	mm
- Approximate overall height of motor	.....	mm
- Approximate stator inner diameter of motor	.....	mm

B. Cooling System

- Type	.....
- Maximum temperature rise at rated output using 30°C of cooling water in enclosure	.....	°C
- Material and thickness of fins	.....	mm
- Material and thickness of tube	.....	mm
- Water velocity in cooler tube	.....	M/sec
- Material of header and water box	.....

Main Motors (con'd)

C. Rotor

- Standard Specification
- Insulation class
- Run out of shafts kg/cm²

D. Shaft

- Diameter mm
- First critical speed rpm
- Maximum runaway speed rpm

E. Bearing

- Type of thrust bearing
- Type of guide bearing
- Material of cooling coil
- Type of bearing insulation

F. Stator

- Type of stator
- Insulation class

G. Anti-condensation heater

- Phase
- Rated voltage V
- Rated current A

H. Brush-less exciter

- Standard Specification
- Insulation class
- Type of rectifier
- Continuous capacity A
- Rated voltage V
- Rated frequency Hz
- Position to the main motor

Main Motors (con'd)

I. Current Transformers

- Maker's Name
- Type
- Transformation ratio A
- Accuracy class
- Rated burden at 45°C for:
 - a. Measuring VA
 - b. Protection VA
- Short circuit strength for:
 - a. 1 sec kA
 - b. 3 sec kA

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Main Pump Starting Panels (VCB-1, 2 and 3)**

1. General

a. Service Voltage	.....	kV
b. Maker's Name	.....
c. Type	.....
d. Material of enclosure	.....
e. Thickness of enclosure	.....
f. Dimension of cubicle		
- Width	.....	mm
- Depth	.....	mm
- Height	.....	mm

2. Bus Bars

a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
e. Minimum clearance between phases	.....	mm
f. Minimum clearance to earthed metal	.....	mm
g. Space between bus bars support	.....	mm

3. Connectors

a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm
d. Minimum clearance between phases	.....	mm
e. Minimum clearance to earth	.....	mm
f. Maximum allowable current density at the worst conditions:		
- For bus bars	.....	A/mm ²
- For connectors	.....	A/mm ²
g. Dynamic short-circuit limiting current	.....	kA
h. Thermal short-circuit limiting current	.....	kA

4. Current Transformers

a. Maker's Name	.....
b. Type	.....
c. Transformation ratio	.....	A
d. Accuracy class	.....
e. Rated burden at 45 °C for:		
- Measuring	.....	VA
- Protection	.....	VA

Main Pump Starting Panels (VCB-1, 2 and 3) (con'd)

f. Short circuit strength for:

- 1 sec kA
- 3 sec kA

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
11 kV Circuit Breakers
For
Main Pump Starting Panels (VCB-1, 2 and 3)**

1. Maker's Name	.....
2. Type	.....
3. Breaking capacity	.....	MVA
4. Particulars		
a. Standard specification	.....
b. Type of main contacts	.....
- Fixed	.....
- Moving	.....
c. Material of main contacts	.....
d. Total travel of moving main contact	.....	mm
e. Material of arcing contacts	.....
f. Type of arc control device	.....
g. Material of arc control device	.....
h. Current density in contact area at rated current	.....
	Amps/mm ²	
i. Voltage drop across contact at rated current	.....	mV
j. Type of operating mechanism	.....
- Closing	.....
- Tripping	.....
k. DC. voltage for closing and tripping	.....
- Normal	.....	volts
- Minimum	.....	volts
i. Minimum clearance in air:		
- Between live parts to earth	.....	mm
- Between phases	.....	mm
5. Weight and Dimensions:-		
- Weight of circuit breaker	.....	tons
- Overall dimensions with bushings, fittings and operation mechanism in open position	.....	mm
6. Performance		
a. Rated voltage between phases	.....	V
b. Rated normal current	.....	A
c. Rated breaking current		
(1) Symmetrical	.....	kA
(2) Asymmetrical	.....	kA
(3) Based on duty cycle and recovery voltage	.....	kV
d. Rated making capacity	.....	MVA

11 kV Circuit Breakers
For
Main Pump Starting Panels (VCB-1, 2 and 3) (con'd)

- e. Short time rating:
 - For 1 sec kA
 - For 3 sec kA
- f. Total travel of moving main contacts mm
- g. Speed of breaker contacts cm/sec
- h. Time from energizing trip coil to contact separation cycle
- i. Time for complete separation of contacts cycle
- j. Total make time cycle
- k. Total break time cycle
- l. Power required at normal voltage by:
 - Trip coil watt
 - Closing coil watt
- m. Flashover voltage of bushing (dry) kV
- n. Withstand impulse level of insulation kV
- o. One minute AC. 50 cycle test voltage kV
- p. Other tests recommended by the manufacturer
- q. Pressure in the vacuum interrupter bar
- r. Contact gap mm

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Measuring Instruments
For
Main Pump Starting Panels (VCB-1, 2 and 3)**

AMMETERS

POSITION	Type and Maker's name	ACCURACY	RANGE OF SCALE	OTHER PARTICULARS

KILO-WATT METERS

POSITION	Type and Maker's name	ACCURACY	RANGE OF SCALE	OTHER PARTICULARS

POWER FACTOR METERS

POSITION	Type and Maker's name	ACCURACY	RANGE OF SCALE	OTHER PARTICULARS

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)**

Relays

For

Main Pump Starting Panels (VCB-1, 2 and 3)

DESCRIPTION	TYPE OF RELAY				
1 – Maker’s Name 2 – Type and Designation 3 – Standard Specification with which relay complies 4 – Relay Characteristic 5 – Range of relay time setting (sec) 6 – Current rating of relay coil (A) 7 – Voltage rating of relay coil (V) 8 – Burden of current coils (VA) 9 – Burden of voltage coil (VA) 10 – Other relay particulars					

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Exciter Transformer Panels**

1. General

a. Service Voltage	.....	kV
b. Maker's Name	.....
c. Type	.....
d. Material of enclosure	.....
e. Thickness of enclosure	.....
f. Dimension of cubicle		
- Width	.....	mm
- Depth	.....	mm
- Height	.....	mm

2. Bus Bars

a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
e. Minimum clearance between phases	.....	mm
f. Minimum clearance to earthed metal	.....	mm
g. Space between bus bars support	.....	mm

3. Connectors

a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm
d. Minimum clearance between phases	.....	mm
e. Minimum clearance to earth	.....	mm
f. Maximum allowable current density at the worst conditions:		
- For bus bars	.....	A/mm ²
- For connectors	.....	A/mm ²
g. Dynamic short-circuit limiting current	.....	kA
h. Thermal short-circuit limiting current	.....	kA

4. Transformers

a. Maker's Name	.....
b. Type	.....
c. Standard Specification	.....
d. Rated output	.....	kVA
e. Method of cooling	.....
f. System of connection	.....
g. Neutral Point	.....
h. Material of insulation	.....

Exciter Transformer Panels (con'd)

i. Primary windings	.....
j. Secondary windings	.....
k. Major insulation	.....
l. Material of core	.....
m. Material of tank	.....
n. Ratio	.....	Volt
o. Iron losses at full load	.....	Watt
p. Copper losses at full load and 95 °C winding temperature	.....	Watt
q. Permissible symmetrical short-circuit current and time	.....	kA
	.....	sec
r. Primary voltage at normal tapping	.....	Volt
s. Corresponding secondary voltage at:		
- No load	.....	Volt
- Full load (Power factor: 100%, at 95°C)	.....	Volt
- Full load (Power factor: 80%, at 95°C)	.....	Volt
t. Full load current secondary side	.....	amp
u. No load current secondary side	.....	amp
v. Impedance voltage	.....	%
w. Temperature rise at rated output above 45°C ambient temp.		
- At oil top level	.....	°C
- Winding temperature	.....	°C
- Core temperature	.....	°C
x. Total weight of transformer including oil	.....	kg
y. Dimensions		
- Approx. overall length	.....	mm
- Approx. overall width	.....	mm
- Approx. overall height	.....	mm
z. One minute voltage withstand test	.....	kV

5. Power Fuses

a. Maker's Name	.....
b. Type	.....
c. Standard Specification	.....
d. Rated voltage	..... kV
e. Rated current	..... kA
f. Breaking capacity	..... MVA

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Exciter Panels**

1. General

- Material of enclosure	.....
- Thickness of enclosure	.....	mm
- Dimensions		
a. Width	.....	mm
b. Depth	.....	mm
c. Weight	.....	kg
- Bus bars		
a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance earthed metal	.....	mm
- Span between bus bar supports	.....	mm

2. Connectors and accessories

- Material and size per phase	.....
- Number and size per phase	.....
- Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance to grounded metal	.....	mm
- Max. allowable current carrying capacity at worst conditions		
a. For bus bars	.....	A
b. For connectors	.....	A
- Temperature rise of plug and socket connections	.....	°C

3. Molded Case Circuit Breakers (MCCBs)

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Breaking capacity	.....	kVA
- Type of main contacts (fixed)	.....
- Type of main contacts (moving)	.....
- Material of main contacts	.....
- Material of arcing contacts	.....
- Type of arc control device	.....
- Voltage drop across contact	.....	mV

Exciter Panels (con'd)

- Material of arc control device
- Current density on contact areaamp/ mm²
- Type of operating mechanism
- a. Closing
- b. Tripping
- Rated voltage between phases Volt
- Rated normal current amp
- Rated breaking capacity (sym) kVA
- Short time rating:
- a. for 1 sec Amp
- b. for 3 sec Amp
- Power required at normal voltage by:
- a. Tripping coil Watt
- b. Closing coil Watt

4. Magnetic Contactors

- Maker's Name
- Type
- Standard Specification
- Type of main contacts
- Material of main contacts
- Current density on contact areaamp/ mm²
- Type of operating mechanism
- a. Closing
- b. Tripping
- DC. Voltage for closing and tripping
- a. Normal Volt
- b. Minimum Volt
- Rated voltage between phases Volt
- Rated normal current amp
- Short time rating:
- a. for 1 sec Amp
- b. for 3 sec Amp
- Power required at normal voltage by:
- a. Tripping coil Watt
- b. Closing coil Watt

Exciter Panels (con'd)

5. Relays

- Maker's Name
- Type and Designation
- Standard Specification with which relay complies
- Relay Characteristic
- Range of relay time setting sec
- Current rating of relay coil A
- Voltage rating of relay coil V
- Burden of current coils VA
- Burden of voltage coil VA
- Other relay particulars

6. AC Exciters

- Maker's Name
- Type
- Standard Specification
- Rated output capacity A
- Maximum output capacity A

7. Rectifiers

- Maker's Name
- Type
- Standard Specification
- Rated output capacity A
- Maximum output capacity A

I/We guarantee the information given above for the equipment offered.

Signature:
Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Auto Transformers**

a. Maker's Name	.....
b. Type	.....
c. Standard Specification	.....
d. Rated voltage	.....	kV
e. Rated output	.....	kVA
f. Method of cooling	.....
g. System of connection	.....
h. Tap changer	.....	%
i. Material of insulation	.....
j. Material of core	.....
k. Material of tank	.....
l. Iron losses at full load	.....	Watt
m. Copper losses at full load and 95 °C winding temperature	.....	Watt
n. Permissible symmetrical short-circuit current and time	.....	kA
	.....	sec
o. Temperature rise at rated output above 45°C ambient temp.		
- At oil top level	.....	°C
- Winding temperature	.....	°C
- Core temperature	.....	°C
p. Total weight of transformer including oil	.....	kg
q. Dimensions		
- Approx. overall length	.....	mm
- Approx. overall width	.....	mm
- Approx. overall height	.....	mm
r. One minute voltage withstand test	.....	kV
s. Induced voltage test	.....	kV
t. Impulse voltage test with wave 1.2/50 micro-sec	.....	kV

I/We guarantee the information given above for the equipment offered.

Signature:
Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
380 V Load Centre (MCC)**

1. General

- Material of enclosure	.....
- Thickness of enclosure	.....	mm
- Dimensions		
a. Width	.....	mm
b. Depth	.....	mm
c. Weight	.....	kg
- Bus bars		
a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance earthed metal	.....	mm
- Span between bus bar supports	.....	mm

2. Connectors and accessories

- Material and size per phase	.....
- Number and size per phase	.....
- Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance to grounded metal	.....	mm
- Max. allowable current carrying capacity at worst conditions		
a. For bus bars	.....	A
b. For connectors	.....	A
- Temperature rise of plug and socket connections	.....	°C

3. Air Circuit Breakers (ACBs)

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Breaking capacity	.....	kVA
- Type of main contacts (fixed)	.....
- Type of main contacts (moving)	.....
- Material of main contacts	.....
- Material of arcing contacts	.....
- Type of arc control device	.....
- Voltage drop across contact	.....	mV
- Material of arc control device	.....
- Current density on contact area	.....	amp/mm ²
- Type of operating mechanism		
a. Closing	.....
b. Tripping	.....

380 V Load Centre (MCC) (con'd)

- DC. Voltage for closing and tripping		
a. Normal	.....	Volt
b. Minimum	.....	Volt
- Rated voltage between phases	.....	Volt
- Rated normal current	.....	amp
- Rated breaking capacity (sym)	.....	kVA
- Short time rating:		
a. for 1 sec	.....	Amp
b. for 3 sec	.....	Amp
- Power required at normal voltage by:		
a. Tripping coil	.....	Watt
b. Closing coil	.....	Watt

4. Molded Case Circuit Breakers (MCCBs)

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Breaking capacity	.....	kVA
- Type of main contacts (fixed)	.....
- Type of main contacts (moving)	.....
- Material of main contacts	.....
- Material of arcing contacts	.....
- Type of arc control device	.....
- Voltage drop across contact	.....	mV
- Material of arc control device	.....
- Current density on contact area	.....	amp/ mm ²
- Type of operating mechanism		
a. Closing	.....
b. Tripping	.....
- Rated voltage between phases	.....	Volt
- Rated normal current	.....	amp
- Rated breaking capacity (sym)	.....	kVA
- Short time rating:		
a. for 1 sec	.....	Amp
b. for 3 sec	.....	Amp
- Power required at normal voltage by:		
a. Tripping coil	.....	Watt
b. Closing coil	.....	Watt

5. Change Over Switches (COS)

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Type of main contacts	.....

380 V Load Centre (MCC) (con'd)

- Material of main contacts
- Current density on contact areaamp/ mm²
- Type of operating mechanism
 - a. Closing
 - b. Tripping
- DC. Voltage for closing and tripping
 - a. Normal Volt
 - b. Minimum Volt
- Rated voltage between phases Volt
- Rated normal current amp
- Short time rating:
 - a. for 1 sec Amp
 - b. for 3 sec Amp
- Power required at normal voltage by:
 - a. Tripping coil Watt
 - b. Closing coil Watt

6. Relays

- Maker's Name
- Type and Designation
- Standard Specification with which relay complies
- Relay Characteristic
- Range of relay time setting sec
- Current rating of relay coil A
- Voltage rating of relay coil V
- Burden of current coils VA
- Burden of voltage coil VA
- Other relay particulars

7. Current Transformer

- Maker's Name
- Type
- Transformation ratio A
- Accuracy class
- Rated burden at 45°C for:
 - a. Measuring VA
 - b. Protection VA
- Short circuit strength for:
 - a. 1 sec kA
 - b. 3 sec kA

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Main Pump-1, 2,3 and 4 MCC**

1. General

- Material of enclosure	.....
- Thickness of enclosure	.....	mm
- Dimensions		
a. Width	.....	mm
b. Depth	.....	mm
c. Weight	.....	kg
- Bus bars		
a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance earthed metal	.....	mm
- Span between bus bar supports	.....	mm

2. Connectors and accessories

- Material and size per phase	.....
- Number and size per phase	.....
- Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance to grounded metal	.....	mm
- Max. allowable current carrying capacity at worst conditions		
a. For bus bars	.....	A
b. For connectors	.....	A
- Temperature rise of plug and socket connections	.....	°C

3. Molded Case Circuit Breakers (MCCBs)

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Breaking capacity	.....	kVA
- Type of main contacts (fixed)	.....
- Type of main contacts (moving)	.....
- Material of main contacts	.....
- Material of arcing contacts	.....
- Type of arc control device	.....
- Voltage drop across contact	.....	mV

Main Pump-1, 2,3 and 4 MCC (con'd)

- Material of arc control device
- Current density on contact area amp
/mm²
- Type of operating mechanism
- a. Closing
- b. Tripping
- Rated voltage between phases Volt
- Rated normal current amp
- Rated breaking capacity (sym) kVA
- Short time rating:
- a. for 1 sec Amp
- b. for 3 sec Amp
- Power required at normal voltage by:
- a. Tripping coil Watt
- b. Closing coil Watt

4. Magnetic Contactors (MCs)

- Maker's Name
- Type
- Standard Specification
- Type of main contacts
- Material of main contacts
- Current density on contact areaamp/ mm²
- Type of operating mechanism
- a. Closing
- b. Tripping
- DC. Voltage for closing and tripping
- a. Normal Volt
- b. Minimum Volt
- Rated voltage between phases Volt
- Rated normal current amp
- Short time rating:
- a. for 1 sec Amp
- b. for 3 sec Amp
- Power required at normal voltage by:
- a. Tripping coil Watt
- b. Closing coil Watt

Main Pump-1, 2,3 and 4 MCC (con'd)

5. Relays

- Maker's Name
- Type and Designation
- Standard Specification with which relay complies
- Relay Characteristic
- Range of relay time setting sec
- Current rating of relay coil A
- Voltage rating of relay coil V
- Burden of current coils VA
- Burden of voltage coil VA
- Other relay particulars

6. Current Transformer

- Maker's Name
- Type
- Transformation ratio A
- Accuracy class
- Rated burden at 45°C for:
 - a. Measuring VA
 - b. Protection VA
- Short circuit strength for:
 - a. 1 sec kA
 - b. 3 sec kA

7. Potential transformer

- Maker's Name
- Type
- Transformation ratio A
- Accuracy class
- Rated burden at 45°C for:
 - a. Measuring VA
 - b. Protection VA

8. Voltmeter

- Type
- Range Volt
- Accuracy class

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Common A & B MCC**

1. General

- Material of enclosure	.....
- Thickness of enclosure	.....	mm
- Dimensions		
a. Width	.....	mm
b. Depth	.....	mm
c. Weight	.....	kg
- Bus bars		
a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance earthed metal	.....	mm
- Span between bus bar supports	.....	mm

2. Connectors and accessories

- Material and size per phase	.....
- Number and size per phase	.....
- Cross section per phase	.....	mm ²
- Min. clearance between phases	.....	mm
- Min. clearance to grounded metal	.....	mm
- Max. allowable current carrying capacity at worst conditions		
a. For bus bars	.....	A
b. For connectors	.....	A
- Temperature rise of plug and socket connections	.....	°C

3. Molded Case Circuit Breakers (MCCBs)

- Maker's Name	.....
- Type	.....
- Standard Specification	.....
- Breaking capacity	.....	kVA
- Type of main contacts (fixed)	.....
- Type of main contacts (moving)	.....
- Material of main contacts	.....
- Material of arcing contacts	.....
- Type of arc control device	.....
- Voltage drop across contact	.....	mV

Common A & B MCC (con'd)

- Material of arc control device
- Current density on contact areaamp/ mm²
- Type of operating mechanism
 - a. Closing
 - b. Tripping
- Rated voltage between phases Volt
- Rated normal current amp
- Rated breaking capacity (sym) kVA
- Short time rating:
 - a. for 1 sec Amp
 - b. for 3 sec Amp
- Power required at normal voltage by:
 - a. Tripping coil Watt
 - b. Closing coil Watt

4. Magnetic Contactors (MCs)

- Maker's Name
- Type
- Standard Specification
- Type of main contacts
- Material of main contacts
- Current density on contact areaamp/ mm²
- Type of operating mechanism
 - a. Closing
 - b. Tripping
- DC. Voltage for closing and tripping
 - a. Normal Volt
 - b. Minimum Volt
- Rated voltage between phases Volt
- Rated normal current amp
- Short time rating:
 - a. for 1 sec Amp
 - b. for 3 sec Amp
- Power required at normal voltage by:
 - a. Tripping coil Watt
 - b. Closing coil Watt

Common A & B MCC (con'd)

5. Relays

- Maker's Name
- Type and Designation
- Standard Specification with which relay complies
- Relay Characteristic
- Range of relay time setting sec
- Current rating of relay coil A
- Voltage rating of relay coil V
- Burden of current coils VA
- Burden of voltage coil VA
- Other relay particulars

6. Current Transformer

- Maker's Name
- Type
- Transformation ratio A
- Accuracy class
- Rated burden at 45°C for:
 - a. Measuring VA
 - b. Protection VA
- Short circuit strength for:
 - a. 1 sec kA
 - b. 3 sec kA

7. Potential transformer

- Maker's Name
- Type
- Transformation ratio A
- Accuracy class
- Rated burden at 45°C for:
 - a. Measuring VA
 - b. Protection VA

8. Voltmeter

- Type
- Range Volt
- Accuracy class

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
DC Power Source**

1. General

- Maker's Name
- Rated capacity Ah
- Material of Enclosure
- Thickness of Enclosure
- Dimensions
- a. Width mm
- b. Depth mm
- c. Height mm
- Bus Bars
- a. Material
- b. Cross section area mm²
- c. Min. clearance between phase and neutral mm
- d. Min. clearance to earthed metal mm
- e. Max. allowable current carrying capacity A

2. Batteries

- Maker's Name
- Type
- Voltage Volt
- Total Number of Cells Cell
- Voltage of Each Cell Volt

3. Charging Rectifiers

- Maker's Name
- Type
- Rated capacity A
- DC Voltage Volt
- AC Voltage Volt
- DC Voltage when set is on normal/quick charging position Volt

4. Circuit Breakers

- Maker's Name
- Type
- Breaking Current kA
- Rated Current A
- Total Break Time ms.

DC Power Source (con'd)

5. Ammeters

- Accuracy %
- Range A

6. Volt meters

- Accuracy %
- Range volt

I/We guarantee the information given above for the equipment offered

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
UPS**

1. General

- Maker's Name	.....
- Rated capacity	.....	kVA
- Material of Enclosure	.....
- Thickness of Enclosure	.....
- Dimensions		
a. Width	.....	mm
b. Depth	.....	mm
c. Height	.....	mm
- Bus Bars		
a. Material	.....
b. Cross section area	.....	mm ²
c. Min. clearance between phase and neutral	.....	mm
d. Min. clearance to earthed metal	.....	mm
e. Max. allowable current carrying capacity	.....	A

2. Batteries

- Maker's Name	.....
- Type	.....
- Voltage	.....	Volt
- Total Number of Cells	.....	Cell
- Voltage of Each Cell	.....	Volt

3. Converter

- Maker's Name	.....
- Type	.....
- Rated capacity	.....	kVA
- DC Voltage	.....	Volt
- AC Voltage	.....	Volt
- Permissible voltage deviation range	.....	%
- Permissible frequency deviation range	.....	%

4. Inverter

- Maker's Name	.....
- Type	.....
- Rated capacity	.....	kVA
- DC Voltage	.....	Volt

UPS (con'd)

- AC Voltage Volt
- Voltage regulation range %
- Voltage accuracy
 - a. Normal deviation %
 - b. Transient deviation %
 - c. Setting time Sec

5. Circuit Breakers

- Maker's Name
- Type
- Breaking Current kA
- Rated Current A
- Total Break Time ms.

6. Ammeters

- Accuracy %
- Range A

7. Volt meters

- Accuracy %
- Range volt

I/We guarantee the information given above for the equipment offered

Signature:
Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Auxiliary Substation**

1. General

a. Service Voltage	.....	kV
b. Maker's Name	.....
c. Type	.....
d. Material of enclosure	.....
e. Thickness of enclosure	.....
f. Dimension of cubicle		
- Width	.....	mm
- Depth	.....	mm
- Height	.....	mm

2. Bus Bars

a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm ²
e. Minimum clearance between phases	.....	mm
f. Minimum clearance to earthed metal	.....	mm
g. Space between bus bars support	.....	mm

3. Connectors

a. Material	.....
b. Number and size per phase	.....
c. Cross section per phase	.....	mm
d. Minimum clearance between phases	.....	mm
e. Minimum clearance to earth	.....	mm
f. Maximum allowable current density at the worst conditions:		
- For bus bars	.....	A/mm ²
- For connectors	.....	A/mm ²
g. Dynamic short-circuit limiting current	.....	kA
h. Thermal short-circuit limiting current	.....	kA

4. Current Transformers

	800 A	75 A
a. Maker's Name	.....
b. Type	.....
c. Transformation ratio	..... A	
d. Accuracy class	.....
e. Rated burden at 45 °C for:		
- Measuring	.....	VA
- Protection	.....	VA

Auxiliary Substation (con'd)

f. Short circuit strength for:

- 1 sec kA
- 3 sec kA

5. Potential transformer

- a. Maker's Name
- b. Type
- c. Transformation ratio A
- d. Accuracy class
- e. Rated burden at 45°C for:
 - Measuring VA
 - Protection VA

6. Zero Phase Current Transformers

- a. Maker's Name
- b. Type
- c. Transformation ratio A
- d. Accuracy class
- e. Rated burden at 45 °C for Protection VA
- f. Short circuit strength for:
 - 1 sec kA
 - 3 sec kA

7. Grounding Voltage Transformer

- a. Maker's Name
- b. Type
- d. Transformation ratio A
- e. Accuracy class
- f. Rated burden at 45°C for Protection VA

8. Transducer

- a. Maker's Name
 - b. Type
 - c. Transformation ratio
 - d. Accuracy class
- For voltage, For current

Auxiliary Substation (con'd)

9. Bus Ducts

- a. Maker's name
- b. Type
- c. Standard specifications
- d. Rated voltage kV
- e. Insulation class
- f. Material of insulation
- g. Material of core
- h. Nominal cross sectional area per core mm²
- i. Resistance of conductor at 20°C per kilometer ohm
- j. Reactance of conductor at 20°C per kilometer ohm
- k. Current carrying capacity A
- l. Max. allowable current at site at worst conditions A
- m. Max. allowable final temperature °C
- n. Dimensions and weight
 - Width mm
 - Height mm
 - Weight per meter kg
- o. Test voltage between core and earth kV

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
11 kV Circuit Breakers
For
Auxiliary Substation**

1. Maker's Name	.....
2. Type	.....
3. Breaking capacity	.....	MVA
4. Particulars		
a. Standard specification	.....
b. Type of main contacts	.....
- Fixed	.....
- Moving	.....
c. Material of main contacts	.....
d. Total travel of moving main contact	.....	mm
e. Material of arcing contacts	.....
f. Type of arc control device	.....
g. Material of arc control device	.....
h. Current density in contact area at rated current	.....
	Amps/mm ²	
i. Voltage drop across contact at rated current	.....	mV
j. Type of operating mechanism	.....
- Closing	.....
- Tripping	.....
k. DC. voltage for closing and tripping	.....
- Normal	.....	volts
- Minimum	.....	volts
i. Minimum clearance in air:		
- Between live parts to earth	.....	mm
- Between phases	.....	mm
5. Weight and Dimensions:-		
- Weight of circuit breaker	.....	tons
- Overall dimensions with bushings, fittings and operation mechanism in open position	.....	mm
6. Performance		
a. Rated voltage between phases	.....	V
b. Rated normal current	.....	A
c. Rated breaking current		
(1) Symmetrical	.....	kA
(2) Asymmetrical	.....	kA
(3) Based on duty cycle and recovery voltage	.....	kV
d. Rated making capacity	.....	MVA

**11 kV Circuit Breakers
For
Auxiliary Substation (con'd)**

- e. Short time rating:
 - For 1 sec kA
 - For 3 sec kA
- f. Total travel of moving main contacts mm
- g. Speed of breaker contacts cm/sec
- h. Time from energizing trip coil to contact separation cycle
- i. Time for complete separation of contacts cycle
- j. Total make time cycle
- k. Total break time cycle
- l. Power required at normal voltage by:
 - Trip coil watt
 - Closing coil watt
- m. Flashover voltage of bushing (dry) kV
- n. Withstand impulse level of insulation kV
- o. One minute AC. 50 cycle test voltage kV
- p. Other tests recommended by the manufacturer
- q. Pressure in the vacuum interrupter bar
- r. Contact gap mm

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Measuring Instruments
For
Auxiliary Substation**

AMMETERS

POSITION	Type and Maker's name	ACCURACY	RANGE OF SCALE	OTHER PARTICULARS

VOLT METERS

POSITION	Type and Maker's name	ACCURACY	RANGE OF SCALE	OTHER PARTICULARS

WATT-HOUR METERS

POSITION	Type and Maker's name	ACCURACY	RANGE OF SCALE	OTHER PARTICULARS

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)**

**Relays
For
Auxiliary Substation**

DESCRIPTION	TYPE OF RELAY				
1 - Maker's Name					
2 - Type and Designation					
3 - Standard Specification with which relay complies					
4 - Relay Characteristic					
5 - Range of relay time setting (sec)					
6 - Current rating of relay coil (A)					
7 - Voltage rating of relay coil (V)					
8 - Burden of current coils (VA)					
9 - Burden of voltage coil (VA)					
10 - Other relay particulars					

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Station Transformer For Auxiliary Substation**

a. Maker's Name	.....
b. Type	.....
c. Standard Specification	.....
d. Rated output	.....	kVA
e. Method of cooling	.....
f. System of connection	.....
g. Neutral Point	.....
h. Material of insulation	.....
i. Primary windings	.....
j. Secondary windings	.....
k. Major insulation	.....
l. Material of core	.....
m. Material of tank	.....
n. Ratio	.....	Volt
o. Iron losses at full load	.....	Watt
p. Copper losses at full load and 95 °C winding temperature	.....	Watt
q. Permissible symmetrical short-circuit current and time	.....	kA
	.....	sec
r. Primary voltage at normal tapping	.....	Volt
s. Corresponding secondary voltage at:		
- No load	.....	Volt
- Full load (Power factor: 100%, at 95°C)	.....	Volt
- Full load (Power factor: 80%, at 95°C)	.....	Volt
t. Full load current secondary side	.....	amp
u. No load current secondary side	.....	amp
v. Impedance voltage	.....	%
w. Temperature rise at rated output above 45°C ambient temp.		
- At oil top level	.....	°C
- Winding temperature	.....	°C
- Core temperature	.....	°C
x. Total weight of transformer including oil	.....	kg
y. Dimensions		
- Approx. overall length	.....	mm
- Approx. overall width	.....	mm
- Approx. overall height	.....	mm
z. One minute voltage withstand test	.....	kV

I/We guarantee the information given above for the equipment offered.

Signature:

Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Emergency Generator**

- a. Maker's Name
- b. Type
- c. Standard Specification
- d. Material of enclosure
- e. Thickness of enclosure
- f. Dimensions
 - Approx. overall length mm
 - Approx. overall width mm
 - Approx. overall height mm
- g. Total weight kg
- h. Engine
 - Type
 - Rated output HP
 - Method of cooling
- i. Generator
 - Rated output kVA
 - Rated voltage V

I/We guarantee the information given above for the equipment offered.

Signature:
Date :

**SCHEDULE OF TECHNICAL DATA
(GUARANTEE TABLES)
Major Cathodic Protection Device**

1. Transformer rectifier

- Rectification: -----
- Rating: -----
- Rated output voltage: -----
- Rated output current: -----

2. High silicon cast iron anode:

- Diameter: -----
- Length: -----
- Weight: -----
- Anode composition in percentage:
 - Si: -----
 - Mn: -----
 - Cr4: -----
 - C: -----
 - P: -----
 - S: -----
 - Fs: -----

3. Cable

- Core: -----
- Material: -----
- Sheathed cable: -----
- Cross-section area: -----

4. Junction Box:

- Materials: -----
- Wall thickness: -----
- Size of box: -----

5. Switch Board:

- Size of switch board: -----
- Model of circuit breaker: -----

Signature : -----

Date : -----