

WEIGHT SCHEDULE FOR MAJOR EQUIPMENTS AT MANGALAM CEMENT

		ITEM	UNIT	QTY	SIZE (MM)	WEIGHT (MT) EACH
1.0	17.5 MW Steam Turbine					
	1.1	Steam Turbine	SET	1	4000x5000x3500	32.000
	1.2	Gear Box	NO	1		11.200
	1.3	Manual Barring Device and Turning Device - Electric	SET	1		0.500
	1.4	Turbine Oil	SET	1		4.000
	1.5	Turbine Enclosure (To meet noise level requirements)	SET	1		5.000
	1.6	Turbine Insulation (Mineral Wool Mattresses)	SET	1		2.000
2.0	17.5 MW Turbine auxillaries					
	2.1	Main Oil Tank (Carbon Steel Matl)	NO	1	4700x2700x2800	6.150
	2.2	Oil Pump with AC Motor	NO	2	2200x750x1000	1.450
	2.3	Emergency Oil Pump with DC Motor	NO	1	1800x550x600	0.600
	2.4	1x100% Jacking Oil Pumps with AC Motor	NO	1	750x500x400	0.250
	2.5	Duplex Filter for Lube Oil	NO	1	2000x650x2500	1.650
	2.6	Oil Vapour Ext Fan with AC Motor (2x100%)	NO	2	500 x 400 x 500	0.075
	2.7	Overhead Lube Oil Tank	NO	1	Dia 2700 x 2500	2.100
	2.8	Oil Accumulators	NO	1		0.250
	2.9	Oil Purification Unit	NO	1	2000 x 2000 x 2000	0.400
	2.10	Governing Console	NO	1	1500 x 1500 x 1600	1.500
	2.11	STEAM JET AIR EJECTOR	NO	1	6000 x 2500 x 3000	0.000
	2.12	LUBE OIL COOLERS - 2X100%.	NO	2	760 x 960 x 3095	0.250
	2.13	Gland Steam Condenser	NO	1	2625 X 500 X 700	1.000
	2.14	Governing Console	NO	1	1400x1400x900	0.700
	2.15	QC NRV	NO	3		0.300
	2.16	H P Heater	NO	1		7.300
	2.17	L P Heater	NO	1		5.000
	2.18	Transfer Oil Pump	NO	1	750x500x400	0.200
	2.19	Drain Oil Cooler	NO	1		1.500
	2.20	Flash Tank	NO	1		1.000
	2.21	Air cooler	NO	1		4.800
	2.22	Handling facilities for bigger size valves and PRDS stations as required.	set	1		5.000

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		ITEM	UNIT	QTY	SIZE (MM)	WEIGHT (MT) EACH
3	17.5 MW GENERATOR AND AUXILIARIES					
	3.1	CLOSED circuit air cooled Generator (VPI)	SET	1	5000x3000x3150	50.600
	3.2	Brush-less exciter and PMG	SET	1		1.600
	3.3	CO2 fire extinguisher equipment for generator.	SET	1		3.000
	3.4	GENERATOR AIR COOLERS.	no	7	3000x670x630	0.960
	3.5	Foundation Materials	SET	1		7.000
	3.6	Air cooler Duct	SET	1	6000x670x630	6.000
4	SYSTEM PIPING				SEE PIPING ANNEX - V	50 MT APPX
5	ELECTRICAL SYSTEM					
	5.1	17.5 MW GEN RELAY PANEL	no	2	800 x 1000x2355	1.000
	5.2	17.5 MW GEN CONTROL PANEL	no	1	1000x800x2265	1.000
	5.3	TURBINE CONTROL PANEL	no	1	1000x800x2295	1.000
	5.4	17.5 MW SPB	set	1		5.000
	5.5	DC EOP STARTER BOX	no	1	1500x550x1775	0.800
	5.6	AVR	no	1	2000x800x2365	1.500

PRICE BREAKUP FOR STG PACKAGE AT MANGALAM CEMENT STG WORKS

		ITEM	Group %	Item %
1	17.5 MW Steam Turbine		30%	
	1.1	Steam Turbine		15.00%
	1.2	Gear Box		10.00%
	1.3	Turbine Enclosure (To meet noise level requirements)		5.00%
2	17.5 MW Turbine auxillaries		50%	
	2.1	Main Oil Tank (Carbon Steel Matl)		2.00%
	2.2	Oil Pump with AC Motor		4.00%
	2.3	Emergency Oil Pump with DC Motor		2.00%
	2.4	1x100% Jacking Oil Pumps with AC Motor		2.00%
	2.5	Duplex Filter for Lube Oil		1.00%
	2.6	Oil Vapour Ext Fan with AC Motor (2x100%)		2.00%
	2.7	Overhead Lube Oil Tank		1.00%
	2.8	Oil Accumulators		1.00%
	2.9	Oil Purification Unit		2.00%
	2.10	Governing Console		2.00%
	2.11	STEAM JET AIR EJECTOR		1.00%
	2.12	LUBE OIL COOLERS - 2X100%.		2.00%
	2.13	Gland Steam Condenser		1.00%
	2.14	Governing Console		1.00%
	2.15	QC NRV		1.50%
	2.16	H P Heater		3.00%
	2.17	L P Heater		2.00%
	2.18	Transfer Oil Pump		1.00%
	2.19	Drain Oil Cooler		1.00%
	2.20	Flash Tank		1.00%
	2.21	Air cooler		2.00%
	2.22	Handling facilities for bigger size valves as required.		2.00%
	2.23	Misc Equip + Aux		12.50%
3	17.5 MW GENERATOR AND AUXILIARIES		20%	
	3.1	CLOSED circuit air cooled Generator (VPI)		10.00%
	3.2	Brush-less exciter and PMG		2.00%
	3.3	CO2 fire extinguisher equipment for generator.		4.00%
	3.4	GENERATOR AIR COOLERS.		4.00%
4	SYSTEM PIPING		ON MT RATE	

NOTE:-FURTHER DETAILING WILL BE DONE AT SITE

**SYSTEM PIPING DETAILS
(MANGLAM CEMENT)**

ANNEXURE-V

SL NO	PG MA	Description	Materials PPG	PG weight (kg)
1	31-301	Valves	CS / AS	332
2	31-302	Valves-II	CS / AS	2349
3	31-304	Gov Oil Piping for QCNRV	CS / SS	1953
4	31-306	Gov Oil Piping for Tripping Device	CS / SS	250
5	31-307	Gov Oil Piping for ESV	SS	44
6	31-308	Gov Oil Piping for Servo Motor	CS / SS	163
7	31-312	CEP Discharge to LCV+Recirc	CS	137
8	31-323	Instrument Air piping	GI / CS	474
9	31-325	Oil Piping Around tank	CS / SS	1138
10	31-326	Lub Oil Piping	CS / SS	6782
11	31-329	Oil Purification System	SS	185
12	31-330	Jacking Oil Piping	CS / SS	766
13	31-331	Gov Oil Piping	CS / SS	671
14	31-332	Pipes For Equip Mounted instruments	SS	224
15	31-333	LO Cooler and Filter vent Piping	CS	182
16	31-335	Cooling Water pipingto Aux	CS	4106
17	31-337	Transfer Oil Piping	CS	500
18	31-338	Oil Vapour Piping	CS	311
19	31-343	Ext-1 Piping	CS	694
20	31-344	Ext-2 Piping	AS (P11)/ CS	1708
21	31-345	Ectraction-III Piping	CS	1531
22	31-350	Balance Piston Piping	CS	100
23	31-351	Gland steam Piping	AS (P11/22)/ CS	2396
24	31-352	Gland Steam to GSC, Exhaust piping	CS	1269
25	31-361	Flash tank Vent to condenser	CS	2951
26	31-363	Exhaust Piping (SRV , Ejec etc)	CS	3496
27	31-366	Valves Gland Sealing Piping	CS	577
28	31-372	Turbine drains Piping	CS / AS	796
29	31-374	Equipment Drains to Condenser	CS	220
30	31-375	LPH Drain Piping	CS	634
31	31-376	HPH Drain Piping	CS	1489
32	31-383	Piping Thermal Insulation		5000
33	31-384	Suspension and supports		823
34	31-386	Raw materials for Suspension and supports		7119
		TOTAL		51370

5. **SAFETY, HEALTH AND ENVIRONMENT REQUIREMENTS (FOR 17.5 MW STG)**

LEGAL

1. As a Contractor, BHEL shall comply with all statutory Acts & Rules – and the amendments thereto.
- a. All the provisions concerning Welfare and Health of the Contract Labour (Regulation & Abolition) Act, 1970 and Rajasthan Rules 1974.
- b. Applicable provisions concerning Health, 'Safety' and Welfare as specified in Factories Act, 1948 and Rajasthan Rules 1969.
- c. Applicable provisions of the ESIC Act, 1948 and the Rules there under.
- d. The Workmen's Compensation Act, 1923 and the Rules there under (if applicable)
- e. The Payment of Wages Act, 1936 and the Rules there under.
- f. Minimum Wages Act, 1948 and the Rajasthan Rules there under.
- g. The Payment of Bonus Act 1965 and the Rules there under
- h. Employees Provident Funds & Misc.Provisions Act 1952 and the Rules thereunder.
- i. Indian Electricity Act and Rules
- j. Indian Boilers Act 1923 & Rajasthan Boilers Rules 1982.
- k. The Building & other Construction Workers (Regulation of Employment & Conditions of service) Act, 1996.
- l. Any other applicable labour legislation as directed by MCL HRD Department from time to time.

BEFORE STARTING THE WORK

WORKMEN

1. BHEL shall submit the list of workers with their full particulars like name in full, Permanent address, address for correspondence, Qualification, Experience, legal heirs (wife; dependent children, parents, siblings), blood group well in advance to HR department for scrutiny. The HR department reserves the right to approve the list. Once the list is approved BHEL shall issue the worker an identity card with a stamp sized photograph.
2. BHEL shall have BHEL own ESI & PF code numbers.
3. BHEL shall issue safety helmet (IS:2925) and safety shoes (IS:1989) to every Worker. The first day of employment at site will be exclusively for safety induction training. BHEL shall administer too box talk to workmen before start of the work everyday.
4. BHEL shall employ young, energetic, duly qualified, trained and medically fit workmen possessing required skills. Pre placement training & medical records shall be produced for verification by company authorized personnel. BHEL shall submit the list of authorized persons for working at height, who have been certified fit for working at height by medical professional, after confirming that they are not suffering from ailments like fits, vertigo, heart problems etc.

TOOLS AND TACKLES

1. The lifting tools & tackles, pressure vessels brought by BHEL to MCL premises should have valid test certificates, issued by a competent person approved by Director of Factories & Boilers in Rajasthan, the copies of which should be submitted to the company personnel for verification and records.
2. Any other instrument brought into MCL premises should have valid calibration certificates traceable to national / international standards the copies of which should be submitted to the company personnel for verification and records.
3. BHEL shall make suitable entries at the main gate before bringing into MCL premises BHEL tools and tackles, based on this certified copy only the material will be allowed outside after completion of the work.
4. Tools & tackles are in BHEL scope. In case if some tools and tackles are issued by MCL depending on the exigency of the work suitable rentals will be charged.



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TOILETS

1. BHEL shall construct latrines and urinals in the area allocated by MCL of prescribed types at workers sheds before deploying manpower at one latrine for every 25 workers. No person shall defecate in the open area. If BHEL workers stay outside factory premises the same is not applicable.
2. All latrines and urinals accommodation shall be of prescribed sanitary types and conform to public health requirements. The floors and internal walls up to a height of ninety centimeters of the latrines, urinals and the sanitary blocks shall be laid in glazed tiles or otherwise finished to provide a smooth polished impervious surface. Every latrine shall be under cover and so partitioned off so as to secure privacy and shall have proper door and fastenings.
3. Such accommodation shall be adequately lighted and ventilated.
4. Separate enclosed accommodation shall be provided for male and female workers.
5. Latrines other than those connected to the MCL sewage treatment plant shall be treated in septic tank and soak pit designed as per IS 2470 part I & II. No overflow from soak pit is allowed.

ELECTRICAL SUPPLY

1. MCL will provide electricity at one point on free of charge basis, the contractor shall have their own Wireman/Electrician having valid Rajasthan Electrical Inspector Licence. Copy of the same shall be submitted to Electrical department.
2. Wherever they take outgoings from one point supply shall be provided with suitable safe trips.
3. They should use only single phase 3 wire system or 3 phase 4 wire system wherever necessary.
4. They will use only PVC insulated cables. No temporary connection/cable wiring is allowed.
5. Lighting shall be provided by themselves including light fittings and its connection, supports etc., MCL will not provide any lighting for any contractor other than area lighting.
6. All the electrical connections shall be as per IE rules.
7. Wherever they construct temporary buildings the wiring shall be done by themselves with safe trip at the in-comer and get it certified by Electrical department before charging.
8. No extension will be accepted without permission in writing for any additional points.
9. Proper earth pits shall be provided for maintaining earth resistance for their supply and equipments.
10. All the tools and tackles must be insulated one i.e., (hand tools) and get it certified from MCL Electrical Department. For each and every tool used should be connected through safe trip and proper earthing.
11. All the Contractor should use welding machine with proper body earth and this body earth shall be connected from the proper earth grid.
12. Electrical department will inspect time to time and they have every right to disconnect any supply at any point of time if they found the rules are violated.
13. BHEL shall provide MCB/ELCB in each electrical circuit as a part of safety.

DURING EXECUTION OF WORK

1. Latrine, urinal and such accommodation shall be maintained in a clean and sanitary condition at all times. Sweepers shall be employed whose primary duty would be to keep clean latrines, urinals and washing places. The floors, portions of the walls and the sanitary pans of latrines and urinals shall be thoroughly washed and cleaned at least once in a day with suitable detergents or disinfectants or with both. No effluent shall be discharged outside the premises.
2. Water supply arrangements shall be available in or near the latrine.
3. All drains carrying waste or sullage water shall be constructed in masonry or other impermeable material and shall be regularly flushed and the effluent disposed off by connecting such drains with a suitable drainage line. Provided that, where there is no such drainage line, the effluent shall be deodorized and rendered innocuous and then disposed of in a suitable manner to the satisfaction of the health officer.



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4. Sufficient spittoons shall be provided. Container shall have a conical funnel shaped cover. A layer of suitable disinfectant liquid shall always be maintained in the container or container can be filled with dry, clean sand and covered with a layer of bleaching powder. The spittoons shall be emptied, cleaned and disinfected at least once in every day.
5. BHEL shall arrange for suitable collection, segregation, transport and disposal of municipal solid waste/garbage generated at workers sheds.
6. BHEL shall avoid the usage of plastics in the premises.
7. One of BHEL supervisor will be available at the main gate everyday to assist MCL security in identifying and taking headcount of BHEL workmen before they enter MCL premises, also submit the list of the persons who have entered the premises.
8. BHEL shall ensure to:
 - a) Disburse the wages to BHEL workers on or before the 7th day after the close of attendance.
 - b) Submit to MCL HRD Department, the photocopy of duly acknowledged wage sheet & muster roll for the previous month clearly showing the effected statutory deductions of Employer's PF contribution and Employer's ESIC contribution for workers.
9.
 - a. BHEL shall designate one senior and literate workman as 'Safety Supervisor' from amongst the workers supplied, if the number of workers employed by BHEL exceeds 25 persons
 - b. BHEL shall appoint one person as 'Safety Officer' if the number of workers Employed by BHEL exceeds 100 persons.The above persons will report to MCL Dy. Manager safety.
10.
 - a. The Company i.e., Mangalam Cement, shall not be liable for any damage or compensation payable in accordance with any law in respect of or as a consequence of any industrial accident/injury to any of BHEL workmen or other person in BHEL employment or any employment of any of BHEL sub Contractor.
 - b. If the accident is fatal, BHEL will be liable to pay compensation payable to the legal heir of the deceased person as per law & mutual agreement between parties.
 - c. If BHEL complete the allotted work without any accident or deviation of safety norms BHEL will be paid suitable bonus based on the performance.
11. BHEL shall ensure to submit physical fitness certificate of the injured workman, if any, to the Welfare Officer, before such workmen resumes duty.
12. BHEL shall strictly follow the applicable Work Permit as evolved by the Company, viz:
 - a) Hot Work Permit,
 - b) Excavation permit,
 - c) Permit for working at heights,
 - d) Permit for working in confined places,
 - e) Line clear permit,
 - f) Radiation work permit etc.
13. BHEL shall prepare safety, health & environmental manual for construction activities for site and it to be submitted to MCL project head before starting of jobs for approval & implementation.
14. BHEL shall forward appropriate reports /documents to concerned Company personnel to facilitate them to monitor Contractor's performance which shall be inclusive of;
 - a) Accident / incident investigation reports and follow up
 - b) Planned inspection reports and follow up
 - c) Instruction Reports to outside agency i.e., Government Insurance etc.
 - d) Meeting Minutes i.e., Joint Committee
 - e) Loss control activities (group meetings, general conditions, risk assessments etc).
 - f) Other (accident /incident analysis audit reports, etc)



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15. BHEL shall advise and ensure that all BHEL workmen, while on duty, apart from safety helmet and shoes wear other PPE (confirming to IS codes) as required to control the possible work hazards associated with the job allocated and strictly adhere to all safety precautions/instructions, as may be given by the Supervisory Staff from time to time.

For working at height safety belt/harness, net
For grinding work goggles
For welding work leather hand gloves, welders
helmet with suitable shade of glass
For handling hot objects heat resistant protective gear
For handling acids PVC apron, gloves, splash goggles
For working in dusty areas nose masks/filters
For working in high noise areas ear plugs/muffs -----etc.,

(The list is only illustrative and not exhaustive.)

BHEL and BHEL workmen also shall follow the emergency procedure, health and occupational hygiene and communication system, as laid down by the Company. Shall clearly communicate to BHEL workmen about possible work hazards. BHEL and BHEL workmen shall follow standards/code of practice in all the activities performed e.g., IS 4014 Part 1 & 2 for scaffolding etc.

16. If and when required, BHEL workmen shall help the Company, in prompt and efficient implementation of "Disaster Management Plan" such as Fire Fighting, First Aid and Evacuation Operations.
17. BHEL shall get done the periodical medical examination of BHEL workmen as required under law; eye testing of crane operators, signalers, drivers lung function test for the people exposed to dusty atmosphere, audiometry for people exposed to high noise, blood and stool examination for food handlers.
18. Maintain adequate number of first aid boxes at the work spot.
19. Canteen services will be on actual cost basis.
20. One internal telephone will be provided by MCL at BHEL site office.
21. Unloading of received material at MCL work site like steel, construction material, machinery required for the work allotted to BHEL is in BHEL scope.
22. No consumable material(e.g., welding electrodes, gas cylinders) will be issued on chargeable basis from MCL stores. BHEL will make BHEL own arrangements after getting the vendors/brands approved for the same by MCL representative.

END OF THE CONTRACT

1. BHEL will produce 'clearance certificate' from ESI & PF authorities having verified BHEL records to HR department, only after the submission of this document final bill will be settled.

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