

ANNEXURE: 4.06

QUALITY ASSURANCE PLAN

1 Quality Assurance

1.1 General Obligations of the Contractor

- i) The Contractor shall establish, staff, equip and operate a comprehensive quality organization at the site during the full period of the Works. The principal responsibility and duty of this organization shall be to ensure that all work carried out and materials produced or supplied by the Contractor comply fully with the Specifications, as well as, with all relevant Indian or other standards.
- ii) With the tender, the Contractor shall submit an outline quality control manual, organization plan and staffing programme. This manual shall list all internal quality control procedures to be undertaken by the Contractor, give details of laboratories (listing their equipment and testing procedures), reporting procedures and quality control training programme for their field staff. Prior to finalization of contract, the Owner shall review and comment on these data, and request any modifications or additions, which are considered necessary.
- iii) Within 28 days of issue of the Notice to Proceed, the Contractor will submit to the Owner, for review and approval, an elaborate and updated quality control manual and programme, which will take into account all comments made previously by the owner.
- iv) At all times, the Contractor's quality control and other site personnel will co-operate with and inform fully the Owner in all matters relating to the quality of work in progress and testing of materials etc., and will reply promptly to any requests by the Owner and its site supervision personnel for additional information and data.
- v) NEEPCO may establish and operate their own site laboratories or use the laboratories of third parties for materials testing, and the contractor will be required to provide NEEPCO the required samples for testing in these laboratories.
- vi) Supervision and testing which may be carried out by the Owner in no way relieves the Contractor of its full and sole responsibility for the quality of the Works and for compliance with the requirements of these specifications.
- vii) In the event of non-readiness, non-establishment, inadequate facilities, etc. of the Contractor's stipulated QC&A lab, the Owner may arrange for testing of the same in outside third-party labs and the costs incurred shall be recovered by the Owner from Contractor's bill.

1.2 Control of the Progress of Work

- i) Close progress control, and the preparation of corresponding progress reports, shall be an important part of a Contractor's quality control responsibilities. Contractor must at all times provide the Owner with up to date information on the progress of work and

must bring to the attention of the Owner of delays or occurrences which could lead to delay.

- ii) The Contractor shall submit detailed monthly progress reports to the Owner, in which the contractual programme for the works is updated and information is given on the quantitative completion of works (in the form of tables indicating the quantities of completed work).
- iii) The monthly progress reports shall give full details of any delays to work in progress or planned, delays in transport to/from the site, together with detailed proposals for overcoming or preventing delays, and for regaining any lost time.
- iv) The Contractor shall at any time, at the request of the Owner, submit detailed reports on particular matters relating to the execution and progress of the works, if such reports are required in order to assess the quality or progress of specific activities or works.

1.3 Contractor's Quality Control Staff

- i) The Contractor shall assign one experienced engineer to the site as full-time quality control officer, responsible with complying with all requirements of this Section.
- ii) The experience and qualifications of this engineer shall be given in the Contractor's tender and shall be subject to the approval of the Owner.

1.4 The positions, and the qualifications and duties, of the Contractor's quality control staff shall be indicated in the quality control organization plan and manual respectively, and shall likewise be subject to approval by the Owner. As a minimum, the Contractor shall appoint one qualified and experienced engineer to be responsible for quality control of each of the construction activities/ fronts.

1.5 Contractor's Laboratories

- i) As required herein, the Contractor shall establish, equip and operate on site laboratories for the testing of the following principal construction materials:
 - a. Concrete, including also the testing of sand, aggregates, cement, water and admixtures,
 - b. Shotcrete, including also the testing of sand, aggregates, cement, water and admixtures,
 - c. TDS and PH value of water and air quality monitoring equipment
 - d. Any site testing and/or calibration of monitoring instruments for conducting on-site testing/ monitoring as required under the contract
- ii) The numbers of samples to be tested, and the timing of testing, shall be as per

Indian Standards or as may be given elsewhere in these specifications.

- iii) The staff of the Contractor's laboratory shall have proven experience in similar previous work and required qualifications.
- iv) Complete records of all laboratory tests carried out shall be kept and it shall be available at any time to the Owner on request.
- v) The Owner shall be permitted at any time and without notice to observe tests being carried out in any of the Contractor's laboratories, to inspect equipment or to study results.
- vi) In the event of the Contractor's lab found not equipped in order to carry out certain tests for checking quality of the works executed, the Owner may carry out the tests through third party lab at the Contractor's cost.
- vii) All test carried out at the Contractor's lab shall be witnessed by the representative of the Owner from time to time for verifying authenticity.

1.6 Materials delivered to Site

- i) The Contractor's quality control staff shall keep full records of all materials delivered to site for use in the Works, and of all tests made on such materials either prior to or following delivery to site.
- ii) These records shall be available at all times to the Owner, together with manufacturers' test certificates.

1.7 Supervision of Transport

- i) In view of the difficulties of access to the site, the Contractor will be required to appoint a transport officer with responsibility for all haulage of materials & equipment to and from site.
- ii) This transport officer will contribute a section of the monthly progress reports covering transport to, from and at the site and any problems related thereto. He will be responsible for notifying the Owner of any problems and/or delays related to transport and for making proposals for overcoming them.
- iii) This transport officer will be responsible for liaising local public and authorities for managing the contractor's vehicle and equipment traffic and transportation of over dimension consignments for the work.

1.8 Environmental Control

- i) The Contractor shall appoint an environmental control officer to be responsible

for ensuring compliance with all specified obligations, laws and regulations with regard to environmental protection of the site of the project, access roads and all site installations.

- ii) The Environmental Control officer must maintain close liaison with the concerned state and regional environmental department and must provide all data needed by these departments and/or the Owner at any time to confirm full compliance with environmental regulations and obligations.
- iii) Details of all environmental protection activities, and cases of environmental damage, if any, shall be included in the monthly progress reports.

QAP FOR CIVIL WORKS OF HEO HE PROJECT

INDICATIVE LIST OF EQUIPMENTS TO BE MAINTAINED BY THE CONTRACTOR FOR FIELD QUALITY CONTROL LABORATORY AND SURVEY

A. FIELD QUALITY LABORATORY SET-UP

Sl. No.	PURPOSE/TYPE OF TEST	LATEST REFERENCE CODES	QTY	LABORATORY EQUIPMENT REQUIRED
A	AGGREGATES FOR CONCRETE AND SHOTCRETE			
1.	Particle Size	IS 2386 (1)	1 set	Sieve Set confirming to IS 460, Electronic balance, Containers, Oven
2.	Flakiness Index	IS 2386 (1)	1 set	Balance, Metal Gauge, Sieve Set
3.	Elongation Index	IS 2386 (1)	1 set	Balance, Metal Gauge, Sieve Set
4.	Angularity Number	IS 2386 (1)	1 set	Metal Cylinder, Tamping rod, Balance, Scoop
5.	Determination of Clay Lumps	IS 2386 (2)	1 set	Balance, Containers and Sieve Set
6.	Determination of Clay, fine silt and fine dust (sedimentation method)	IS 2386 (2)	1 set	Glass Jar, sedimentation pipette, rotating device, measuring cylinder, oven, balance
7.	Determination of light weight pieces (coal and lignite)	IS 2386 (2)	1 set	Balance, container, skimmer, hot plate or oven
8.	Estimation of organic impurities	IS 2386 (2)	1 set	Glass bottle and chemicals

Sl. No	PURPOSE / TYPE OF TEST	LATEST REFERENCE CODES	QTY	LABORATORY EQUIPMENT REQUIRED
9.	Determination of specific gravity and water absorption	IS 2386 (3)	1 set	Balance, Oven, wire basket, containers, glass jars, Pycnometer
10.	Determination of bulk density and voids	IS 2386 (3)	1 set	Balance, Cylindrical metal measures, Tamping rods
11.	Determination of necessary adjustment of bulking of fine aggregates (Field Method)	IS 2386 (3)	1 set	Measuring cylinders, tamping rods, containers
12.	Determination of surface moisture in fine aggregates (field method)	IS 2386 (3)	1 set	Balance, Flask
13.	Determination of aggregate crushing value	IS 2386 (4)	1 set	Steel Cylinder, plunger, base plate, tamping rod, balance, sieve set, compression testing machine, cylindrical metal measure
14.	Determination of percentage fine value	IS 2386 (4)	1 set	Steel Cylinder, plunger, base plate, tamping rod, balance, sieve set, compression testing machine, cylindrical metal measure
15.	Determination of aggregate impact value	IS 2386 (4)	1 set	Impact testing machine set, Sieve set, measures, tamping rod, balance, oven
16.	Determination of aggregate abrasion value	IS 2386 (4)	1 set	Deval machine, abrasive charge, sieve set or Los Angeles machine set
17.	Determination of aggregated crushing strength	IS 2386 (4)	1 set	Compression testing machine set, Oven

18.	Determination of aggregate soundness	IS 2386 (5)	1 set	Sieve set, containers, temperature regulation, balances, oven, reagents (MgSO ₄ , Na ₂ SO ₄)
19.	Measuring mortar making properties of fine aggregates	IS 2386 (6)	1 set	Flow table, flow mould, tamping rod, trowels, moulds, tamping bars, compression testing machine
B	CEMENT			

20.	Determination of fineness by Blaine air permeability method	IS 4031 (2)	1 set	Blaine type air permeability apparatus, timer, balance, standard weights, Pycnometer, manometer liquid, mercury
C	CONSTRUCTION WATER			
21.	Residue (total solids - dissolved and suspended)	IS 3025 (15)	1 set	Evaporating dish, steam bath, drying oven, desiccators, analytical balance, magnetic stirrer
22.	Non-filterable Residue (total suspended solids)	IS 3025 (17)	1 set	Filters, Gooch crucible, glass fiber filter disc, filtering apparatus, oven, desiccators, analytical balance, magnetic stirrer
23.	Volatile and Fixed Residue (total, filterable and nonfilterable)	IS 3025 (18)	1 set	Evaporating dish, steam bath, drying oven, desiccators, analytical balance, muffle furnace
D	REINFORCEMENT AND STRUCTURAL STEEL			

24.	Welding tests and welding requirements	IS 2751, IS 9417, IS 814, IS 816, IS 5878	1 set	As per requirement of relevant codes
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E	ADMIXTURES			
25.	Dry Material Contents	IS 9103	1 set	Glass bottles, balance, oven, desiccators, Pipette
26.	Relative density of liquid admixtures	IS 9103	1 set	Constant temperature bath, measuring cylinder, hydrometer
F	CONCRETE AND SHOTCRETE			
27.	Workability by Slump Test	IS 1199	3 set	Slump test mould, temping rod
28.	Workability by compacting factor	IS 1199	1 set	Compacting factor apparatus
29.	Consistency of concrete by Vee-Bee consistometer	IS 1199	1 set	Vee-Bee consistometer, vibrating table
30.	Air content of freshly mixed concrete by pressure method	IS 1199	1 set	Measuring bowl, conical cover assembly, calibration cylinder, trowel, funnel etc
31.	Setting time by penetration resistance	IS 8142	2 set	Containers for mortar specimen, penetration resistance apparatus, pipette, temping rod
32.	Test for Compressive strength	IS 516	1 set	Cube moulds, compression testing machine, cylinders, temping rods, laboratory concrete mixer
33.	Concrete core testing machine	IS 516, IS 456	1 set	Laboratory Diamond Coring Machine, Compression testing machine
34.	Test for length change (drying shrinkage)	IS 1199	1 set	Measuring apparatus with micrometer gauge, oven, specimen mould

35.	NDT of concrete by Rebound Hammer (Schmidt Hammer)	IS 13311 (2)	2 set	The rebound hammer
36.	Temperature of Concrete	IS 456	1 set	Digital Thermometers
G	GROUT			
37.	Fluidity / viscosity of grout material	IS 14343	1 set	Marsh Cone, measuring cylinder
38.	Density by hydrometer or mud balance	As per relevant standards	Set-1	Set-up for density determination
39.	Water Pressure testing / permeability testing	IS 5529	Set-1	Permeability tests set-up
H	GEOTECHNICAL INVESTIGATION AND ROCK MECHANICS			
40.	Permeability test	IS 5529	Set-1	Permeability tests set-up
41.	Conducting pull-out test on rock bolts and anchor bars	IS 11309	Set-2	Central Hole jack, measuring and pressuring devices
42.	In-situ Density test	IS 2720 (Part-XXVIII)	Set-1	Sand cone method
43.	In-situ moisture content test	IS 2720 (Part II)	Set-1	

B. SURVEYING EQUIPMENTS/INSTRUMENTS

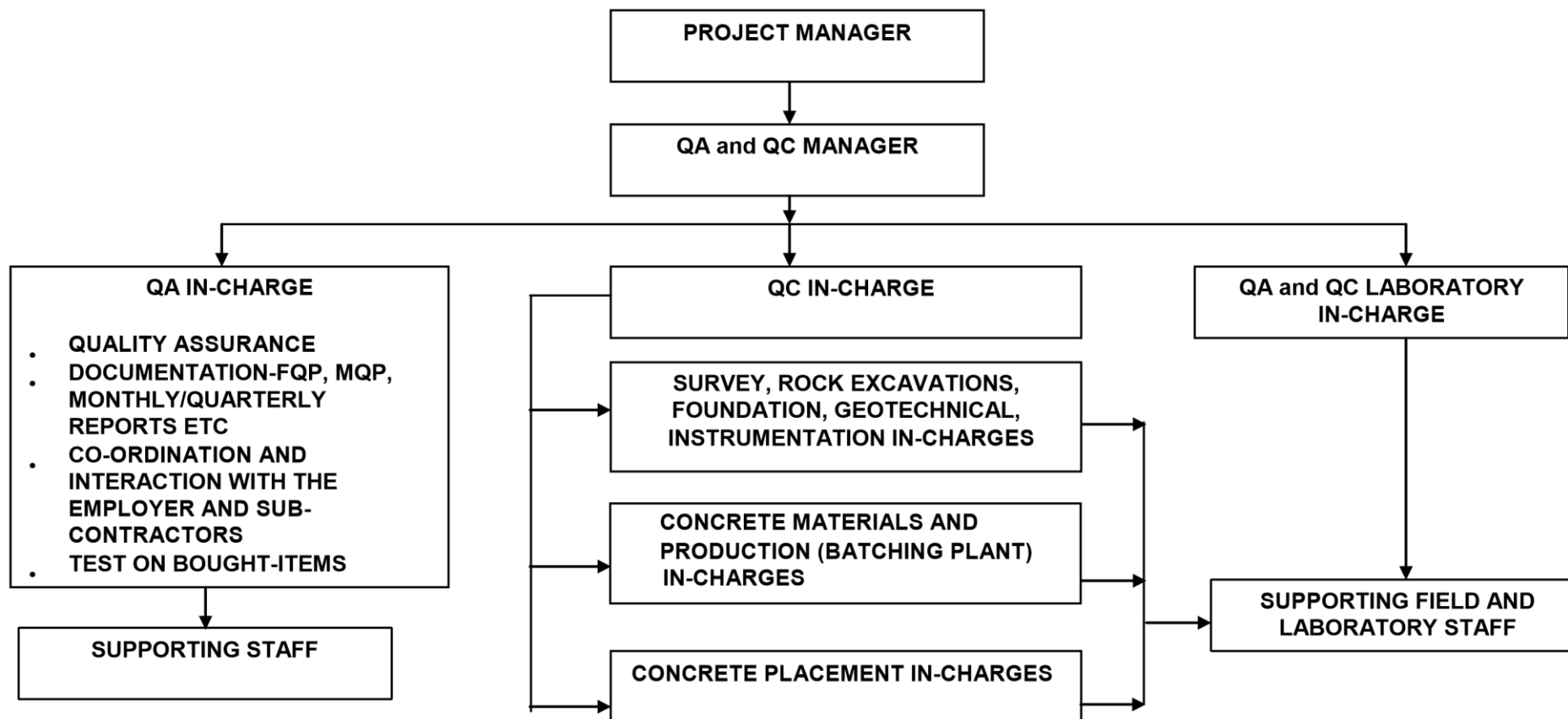
Sl. No	Description of survey equipment	Quantity
1.	Advance Total Station Set	As per site requirement
2.	Laser Survey Set-up	As per site requirement
3.	Advanced/ Digital Theodolite, Auto levels, Plane Table, Compass, Ranging rods, Tacheometer etc	As per site requirement

NOTE:

1. The above laboratory equipment list is indicative. The Contractor shall mobilize all the laboratory equipment in good working conditions preferably not more than 3 years old to carry out all the tests required to meet the specified requirements.
2. Physical and chemical test of structural and reinforcement steel, Alkali aggregate reactivity tests, Petrographic test of aggregate, Geotechnical tests on rock samples, Plate load test at site and any other test not mentioned here but required as per Indian standards/ Technical specification of the work shall be conducted at NABL accredited laboratory/reputed Institution/govt laboratories approved by the Owner.
3. All laboratory / measurement / survey equipment to be used at Site shall be calibrated by accredited laboratories/agencies.
4. The items of test and standards stated are indicative only. It shall be made exhaustive in the QAP to be implemented by the contractor.

ANNEXURE II

CONTRACTOR'S QA and QC MANPOWER/FUNCTIONAL STRUCTURE



NOTE: The Contractor shall submit the details/ bio-data of QA and QC manager (s) along with their deployment schedule for approval/ acceptance.

The Contractor shall mobilize additional manpower, if required to meet the construction schedule.

		Project: Contractor : Contract No. :				STATUS OF ITEM REQUIRING QP AND SUPPLIER APPROVAL				DOC. NO.:	
										REV. NO.:	
										DATE:	
										PAGE: OF	
S. N.	Item / Service	QP/ Insp. Cat.	QP Sub. Schedule Approval schedule	Date of submission	Date of commt. Appl.	Status Code C/II/I	Proposed Suppliers	Place manufacturing works	Approval Status	Supplier detailed submission schedule	Remarks
FORMAT NO.: QS-01-QAI-P-02/F1-R0				1/1				Engg. Div. / QA and I			

[illegible]

LEGENDS

1. SYSTEM SUPPLIER APPROVAL STATUS CATEGORY (SHALL BE FILLED BY THE OWNER)

A – For these items proposed vendor is acceptable to the Owner. To be indicated with letter “A” in the list along with the condition of approval, if any. **DR** – For these items “Details Required” for the Owner’s review. To be identified with letter “DR” in the list.

NOTED – For these items vendors are approved by Supplier and accepted by the Owner without specific vendor approval from the Owner. To be identified with ‘NOTED.’

2. QP/INSPN CATEGORY:

CAT-I: For these items the Quality Plans are approved by the Owner and the final acceptance will be on physical inspection witness by the Owner.

CAT-II: For these items the Quality Plans approved by the Owner. However, no physical inspection shall be done by the Owner. The final acceptance by the Owner shall be on the basis review of documents as per approved QP.

CAT-III: For these items Supplier approves the Quality Plans. The final acceptance by the Owner shall be on the basis certificate of conformance by the main supplier.

UNITS/ WORKS: Place of manufacturing Place of Supplier of multi units/works.

FORMAT NO.: QS-01-QAI-P-1/F3-R0	1/1	Engg. Div. / QA and I
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MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT :					
			ITEM :		QP NO.:		CONTRACT NO. : MAIN-SUPPLIER:					
SUB-SYSTEM:		REV. NO.:		DATE:								
PAGE: OF....												
SL NO	COMPONENT AND OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									M	C	N	
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	**	10.	11.
FORMAT NO.: QS-01-QAI-P-02/F1-R0			1/1				Engg. Div. / QA and I					

MFGR.'s LOGO	SUPPLIER'S NAME AND ADDRESS		FIELD QUALITY PLAN				PROJECT : CONTRACT NO. MAIN-SUPPLIER: :			
			ITEM : SUB-SYSTEM :		QP NO.: REV. NO.: DATE: PAGE: OF....					
SL. NO	ACTIVITY AND OPERATION	CHARACTERISTIC / INSTRUMENTS	CLASS # OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	10.
								DOC. NO.: REV.....		

		LEGEND: * RECORDS, IDENTIFIED WITH “TICK” (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. LEGEND TO BE USED: CLASS # : A = CRITICAL, B=MAJOR, C=MINOR; ‘A’ SHALL BE WITNESSED BY THE OWNER FQA; ‘B’ SHALL BE WITNESSED BY THE IN-CHARGE OF ERECTION / CONSTRUCTION DEPTT. AND ‘C’ SHALL BE WITNESSED BY ERECTION SUPPLIER (A AND B CHECK SHALL BE DONE BY THE OWNERT AT CHP STAGE)	FOR THE ENGINEER USE			
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER					
SIGNATURE				REVIEWED BY	APPROVED BY	APPROVAL SEAL
FORMAT NO.: QS-01-QAI-P-02/F1-R0		1 / 1		Engg. Div. / QA and I		

FORMATS FOR OK CARDS

		NEEPCO Limited			Card No.-
		Project Name: HEO HE Project			
		O.K. Card for Concrete for Linings of Tunnel, Shafts			
Name of Work	:	:	:	Grade of Concrete	:
Location/structure	:	:	:	Estimated Quantity to be poured	:
Date	:	:	:		
RD/Chainage : From.....To.....				Lift Elevation	
From.....To.....					
Ref. Drawing No.	:	:	:		

Sl. No.	Description	O.K./Not by Rep. of Contractor	O.K./Not O.K. by Owner	Remarks
A)	Pre Pour Checks			
1.	General			
	a) Survey line/Centre line position/Grades/excavation cross section			
	b) Surface/ Joints/Base Preparation (inclusive of any treatment necessary)/use of compressed air/removal of all used			
	c) Adequacy of construction aids/ tools/arrangements/access etc.			
	d) Geological Mapping (If applicable) and rock classification			
	e) Arrangement for draining of seepage water			
	f) Condition of transport & placing equipment			

	g)	No. of Vibrators and their condition with standby provisions			
	h)	Status of lighting and ventilation system			
	i)	Clean ness of Invert			
	j)	Priming of pump and pump lines			
2.	Form Work				
	a)	Alignment, Centering			
	b)	Level			
	c)	Vertically/ Slope Check			
	d)	Support/ Stability			
	e)	Cleaning & applying release agents			
3.	Reinforcement (as per approved drawing no.)				
	a)	Type/ diameter of bar			
	b)	Spacing/No. of bars			
	c)	Cover			
	d)	Extra reinforcement			
	e)	Deviation from drawing(if any)			
	f)	Placement/Alignment			
	g)	Clean up			
	h)	Welding/Binding/Lapping/Coupling			

4.	Embedded Parts (as per approved drawing no.)
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	a)	Embedded parts i) Civil (water stop, pipes, dowel, ribs etc.) ii) Monitoring instruments iii) HM iv) E&M			
	b)	Position of Embedded Part			
	c)	Arrangement for protection during concrete			

			(Signature) Name: Designation:	(Signature) Name: Designation:	
Cleared/ Not Cleared for Concreting					
(Rep. of Owner) Name: Designation:					

		NEEPCO Limited		Card No.-
		Project Name: HEO HE Project		
		OK card for Quality Checks During Concrete lining		
Name of Work		:	Date of Pouring	:
Location/structure		:	Grade of Concrete	:
RD/Chainage		:	Actual Quantity Poured	:
Ref. Drawing No.		:	Lift Elevation	:
Time of Start		:		
Time of Completion		:		
Sl. No.	Description		Quantity/ Measurement	Remarks
B)	Check During Concreting			
	a)	Slump achieved (in mm)		
	b)	Mode of Concrete Placement/pouring		
	c)	Height of free fall of concrete		
	d)	Duration of pour (From.....To.....)		
	e)	Compaction of Concrete as per TS		
	f)	No. of samples/ cubes taken		
	g)	Temperature of Air		
	h)	Temperature of Concrete		
	i)	Meteorological Condition		
	j)	Humidity in Air		
	k)	Thickness of layer poured		
	l)	Time interval between successive layer		
	m)	Initial setting time of cement		
	n)	Any other information		
		(Rep. of Contractor) Name: Designation:	(Rep. of Owner) Name: Designation:	

		NEEPCO (A Government of India Enterprise)				Card No.-
		Project Name: HEO HE Project				
		O.K. Card for Concrete				
Name of Work	:			Grade of Concrete	:	
Location/struct Date	:			Estimated Quantity to be poured	:	
RD/Chaige	:	From.....To.....		Lift Elevation From.....To.....		
Ref. Drawing	:					
Sl. No.	Descripti on			O.K./Not O.K. by Rep. of	O.K./Not O.K. by Rep. of Owner	Remarks
A)	<u>Pre Pour Checks</u>					
1.	General					
	a)	Survey line/Centre line Position/Grades				
	b)	Surface/ Joints/Base Preparation (inclusive of any treatment)				
	c)	Adequacy of construction aids/ tools/arrangements/access etc.				
	d)	Geological Mapping (If applicable)				
2.	Form Work					
	a)	Alignment, Centering				
	b)	Level				
	c)	Vertically/ Slope Check				
	d)	Support/ Stability				
	e)	Cleaning & applying release agents				
3.	Reinforcement (as per approved drawing no.)					
	a)	Type/ diameter of bar				
	b)	Spacing/No. of bars				
	c)	Cover				
	d)	Extra reinforcement				
	e)	Deviation from drawing(if any)				
	f)	Placement/Alignment				
	g)	Clean up				
	h)	Welding/Binding/Lapping/Coupling				
4.	Embedded Parts (as per approved drawing					
	a)	Embedded parts i) Civil (water stop etc.) ii) Monitoring instruments iii) HM iv) E&M				
	b)	Position of Embedded Part				
	c)	Arrangement for protection during concrete				
				(Signature) Name:	(Signature) Name:	
				Designation:	Designation:	
Cleared/ Not Cleared for Concreting						
(Rep. of Owner) Name:						
Designation:						

		NEEPCO (A Government of India Enterprise)		Card No.-		
		Project Name: HEO HE Project				
		O.K. Card for Barrage Spillway Concrete				
Name of Work	:			Grade of Concrete	:	
Location/struct	:			Estimated Quantity to be poured	:	
Date	:					
RD/Chaige	:	From.....To.....		Lift Elevation From.....To.....		
Ref. Drawing	:					
Sl. No.	Descripti on			O.K./Not by Rep. of Contractor	O.K./Not O.K. by of Owner	Remarks
A)	Pre Pour Checks					
1.	General					
	a)	Survey line/Centre line Position/Grades				
	b)	Surface/ Joints/Base Preparation (inclusive of any treatment necessary)				
	c)	Adequacy of construction aids/ tools/arrangements/access etc.				
	d)	Geological Mapping (If applicable)				
2.	Form Work					
	a)	Alignment, Centering				
	b)	Level				
	c)	Vertically/ Slope Check				
	d)	Support/ Stability				
	e)	Cleaning & applying release agents				
3.	Reinforcement (as per approved drawing no.)					
	a)	Type/ diameter of bar				
	b)	Spacing/No. of bars				
	c)	Cover				
	d)	Extra reinforcement				
	e)	Deviation from drawing(if any)				
	f)	Placement/Alignment				
	g)	Clean up				
	h)	Welding/Binding/Lapping/Coupling				
4.	Embedded Parts (as per approved drawing no.)					
	a)	Embedded parts i) Civil (water stop etc.) ii) Monitoring instruments iii) HM iv) E&M				
	b)	Position of Embedded Part				
	c)	Arrangement for protection during concrete				
5	Concrete cut-off wall (as per approved drawing no.)					
	a)	Alignment				
	b)	Level				
	c)	Guide wall				
	d)	Reinforcement				
	e)	Cut-off gallery/Access gallery				
	f)	Drainage etc.				
				(Signature) Name:	(Signature) Name:	
				Designation:	Designatio n:	
Cleared/ Not Cleared for Concreting						
(Rep. of Owner) Name:						
Designation:						

		NEEPCO (A Government of India Enterprise)		Card No.-
		Project Name: HEO HE Project		
		Quality Checks During Concreting		
Name of Work		:	Date of Pouring	:
Location/structure		:	Grade of Concrete	:
RD/Chainage		:	Actual Quantity Poured	:
Ref. Drawing No.		:	Lift Elevation	:
Time of Start		:		
Time of		:		
Sl. No.	Description		Quantity/ Measurement	Remarks
B)	Check During Concreting			
	a)	Slump achieved (in mm)		
	b)	Mode of Concrete Placement		
	c)	Duration of pour (From.....To.....)		
	d)	Compaction of Concrete		
	e)	No. of samples/ cubes taken		
	f)	Temperature of Air		
	g)	Temperature of Concrete		
	h)	Meteorological Condition		
	i)	Humidity in Air		
	j)	Any other Information		
		(Rep. of Contractor) Name: Designation:	(Rep. of Owner) Name: Designation:	

Format-F

		NEEPCO (A Government of India Enterprise)				Card No.-
		Project Name: HEO HE Project				
		OK Cards for Construction Joints				
Name of Work	:			Grade of Concrete	:	
Location/structure Date & Time	:			Estimated Quantity to be poured	:	
RD/Chainage From.....To.....				Lift Elevation From.....To.....		
Ref. Drawing No.	:					
Sl. No.	Description			O.K./Not O.K. by Rep. of	O.K./Not by Rep. of Owner	Remarks
1	Location of Construction joints RD wise					
2	Are they as per approved drawing or as per Owner's instruction?					
3	Location of Horizontal joints EL					
4	Has the front surface cleaned by wet sand blasting and by roughened by brush hammering and washed by air water jets					
5	Air Pressure of wet sand blasting equipment or pressure of high pressure water blasting					
6	Is the water used is safe for cutting, washing and rinsing					
7	Has starter mix of approved mix and slump placed					
8	On completion what type of treatment carried out (Epoxy or any special treatment)					
				(Signature)	(Signature)	
Cleared/ Not Cleared for Concreting (Rep. of Owner) Name: Designation:						

Format-G

		NEEPCO		Card No.-
		(A Government of India Enterprise)		
		Project Name: HEO HE Project		
		Check for Curing		
Name of Work	:	Date	:	
Location/structure	:	Date of Concrete pouring	:	
Sl. No.	Description			Remarks
a)	Type of curing arrangement			
b)	Curing done (From.....To.....)			
c)	Temp. of water for curing			
d)	Water test conducted & is it safe for curing work			
i)	Any membrane forming compound used for curing			
ii)	If yes, has it been approved by Owner			
(Rep. of Contractor) Name: Designation:				(Rep. of Owner) Name: Designation:

		NEEPCO Limited		Card No.-	
		Project Name: HEO HE Project			
		OK Cards for drilling, grouting (Contact & Consolidation)			
Name of Work	:		Range of Grout mixture	:	
Location/structure	:		Amount of bentonite added	:	
Date & Time	:			:	
RD/ Chainage From.....To.....			Admixtures	:	
Ref. Drawing No.	:				
Sl. No.	Description		O.K./Not O.K. by Rep. of Contractor	O.K./Not O.K. by Rep. of NEEPCO	Remarks
1	Has holes being drilled at locations, in the sequence, orientation, inclination and to the depths as per approved drawings or as required by Owner				
2	Type of drilling done				
3	Has any artesian conditions or water loss condition encountered during delay				
4	On completion of drilling, washing has been conducted and the holes have been capped with proper plugs				
5	Pressure test has been conducted as per IS 6066				
6	Has grouting being done in stages, depths to be mentioned				
7	On completion of grouting what was the absorption of grout for a specified time as per TS				
8	Was the grouting done in a continuous flow with the required pressure				
9	Has the grout holes been backfilled with the approved grout mix				
10	The pressure of grouting for contact grouting				
11	Vent pipes for release of air and water has been suitably				
12	On completion of grouting was the requisite pressure maintained for the requisite time as per TS without further grout intake				
13	Has the grout holes being properly washed with water under the requisite pressure and the returning water is				
14	Has consolidation grouting done in single stage or in multi stage (by ascending or descending arrangement)				
15	When was consolidation grouting commenced with date of concrete placement and the completion date of contact grouting				
16	The number of holes drilled with their depth and spacing				
17	Was the grouting done in a continuous operation and at what pressure				
18	Was there any sudden of pressure or a sudden increase in grout intake. If yes, has the crack or opening been located and caulked				
19	What is the fineness of cement				
20	After completion of grouting the packers and the pressure had been maintained after the grout has attained its initial set-up				
21	The completion of grouting has been done after the requirement of TS has been met.				
Cleared/ Not Cleared					
(Rep. of Owner) Name:					
Designation:					

Format-I

		NEEPCO Limited		Card No.-	
		Project Name: HEO HE Project			
		O.K. Card for Rock Bolts/ Rock Anchors/ Tendons			
Location	:		Date	:	
Ref. Drawing No.	:		Chainage	:	From.....To.....
Dia	:		No. of Rock Bolt/ Anchor/Tendon	:	
Sl. No.	Check Items		O.K./Not O.K. by Rep. of Contractor	O.K./Not O.K. by Rep. of Owner	Remarks
1.	Marking the bolting pattern				
2.	Measurement of Drilled holes /Inclination				
a.	Diameter of the Drill hole (As per approved drawing/Technical Specifications)				
b.	Length of the Drill hole(As per approved drawing/Technical Specifications)				
3.	Washing and cleaning/ Checking for water				
4.	Preparation done of the Rock surface around the drill hole for bearing plate.				
5.	Type of Rock Bolt/ Rock Anchor/ Tendon				
6.	Water/cement ratio of grout and its composition				
7.	Method used for driving the rock bolt/ rock anchor				
8.	Stressing done of rock bolts to the extent specified (Only in case of Rock Bolt).				
9.	Plugging/ caulking of cracks and fissures				
10.	Pull out test as per T.S.				
11.	Additional test done in case of failure of any rock bolt during pull out test.				
Accepted/ Not Accepted (Rep. of Owner) Name: Designation:			(Rep. of Contractor) Name: Designation:	(Rep. of Owner) Name: Designation:	

		NEEPCO (A Government of India Enterprise)		Card No.-
		Project Name: HEO HE Project		
Observation Record of Concrete after removal of Formwork				
Name of Work	:	Type of Structure (as per TS)		:
Location/structure	:	Date		:
RD/Chainage	:	From.....To.....		
Concrete poured On	:			
Sl. No.	Description	Yes	No	Remarks
A)	Check after removal of formwork			
1.	Any honeycombed area observed			
2.	Any bulging observed			
3.	Any surface undulation/ finish observed which is beyond tolerance limit			
4.	Surface etching, slurry loss, slurry streak etc. observed			
5.	Protection of exposed surface of concrete			
6.	Curing arrangement made			
7.	Surface finish acceptable			
(Rep. of Contractor) Name: Designation:		(Rep. of Owner) Name: Designation:		
Acceptance with Remarks:				
Details of follow up action if any:		(Rep. of Owner) Name: Designation:		

QAP FOR HM WORKS OF HEO HE
PROJECT

1. Embedded parts for Slide Type/Wheel type/Hinged type/Radial Gates (Sill beam, Seal Seat, Side Guides, Track, Anchor rod etc.)

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.				
Name of Equipment: 2nd stage Embedded parts for Slide Type/Wheel type/Hinged type/Radial Gates(Sill beam, Seal Seat, Side Guides, Track, Anchor rod etc.)					Executing Agency:				
					W.O NO.:				
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY			Remarks
						Perform	Witness	Verify	
A	Raw Material								
1	Structural steel-Steel plates, Steel Section like Angle, Channel, Beam etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant IS std./Approved Drgs.	Test Certificate	2	—	1	TC
2	Stainless Steel	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant IS std./Approved Drgs.	Test Certificate				
B	Bought out Items								
3	Hardware (Fasteners)	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant IS std./Approved Drgs.	Test Certificate	2	—	1	TC
II	In Process Inspection								

1	Welding	Visual/Measurement	100%	Tech. Spec./Relevant IS std./Approved Drgs.	IR	2	–	1	RR
2	Fillet Welds	D P test	100%	Tech. Spec./Relevant IS std./Approved Drgs.	TC	2	–	1	RR
3	Full strength welds (Butt weld)	RT/UT	100%	Tech. Spec./Relevant IS std./Approved Drgs.	TC	2	–	1	RR
4	Machining (Roller track, seal track)	Visual/Measurement	100%	Tech. Spec./Relevant IS std./Approved Drgs.	IR	2	–	1	RR
D	Final Inspection								
1	Dimensional Check including alignment and tolerances	Visual/Measurement	100%	Tech. Spec./Relevant IS std./Approved Drgs.	JIR	2	–	1	CHP
2	Welding Examination								
i)	Weld Size	Visual/Measurement	at Random	Tech. Spec./Relevant IS std./Approved Drgs.	IR	2	–	1	RR
ii)	Fillet Welds	D P test	10% of fillet welds length	Tech. Spec./Relevant IS std./Approved Drgs.	JIR	2	–	1	CHP
3	Surface Finish (Machined Surface)	Visual comparison with Comparator	100%	Tech. Spec./Relevant IS std./Approved Drgs.	JIR	2	–	1	CHP
4	Shop Assembly (Frame & Guides)	Visual/Measurement	100%	Tech. Spec./Relevant IS std./Approved Drgs.	JIR	2	–	1	CHP

5	Grit Blasting (Surface preparation)	Visual/Measurement	Random	Tech. Spec/Relevant IS std./Approved Drgs.	TC	2		1	TC
6	Primer/Paint Coating	Visual/Measurement	Random	Tech. Spec/Relevant IS std./Approved Drgs.	TC	2		1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'								
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.								

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

2. Slide/Fixed wheel/Hinged type gates (Intake Gate, Trash racks, Under sluice Gate, Stoplogs, Draft tube gate, etc.)

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Slide/Fixed wheel/Hinged type gates (Intake Gate, Trash racks, Under sluice Gate, Stoplogs, Draft tube gate, etc.)					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel-Steel plates, Steel Section like Angle, Channel, Beam etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Stainless steel	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Forged Steel/Cast Steel	UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	2	TC
B	Bought out Items							
1	Hardware (Fasteners)	Dimension Report, Material Properties	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC

2	Rubber Seals	Make, Type, Dimension Report, Material Properties	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Bushing, Bearing	Make, Type, Dimension Report, Material Properties	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
C	In Process Inspection							
1	Structural steel, Stainless steel & Forged steel							
i	Edge Preparation	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
ii	Dimensional Check in Track position	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
2	Welding	Visual/Measurement	At Random	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
I	Fillet welds	DP test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Machining Dimensions							
i	Seal Bases, Clamp Bar, Rollers, Wheels, Guide brackets	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR

ii	Sub Assembly of Gate Wheels	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
iii	Dimensions (Fits & Tolerances)	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
4	C.G Establishment/Gate Units	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
D	Final Inspection							
1	Dimensional Check on assembled gate	Measurment	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Welding Examination	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
i	Fillet welds	DP test	10% of fillet weld	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Surface Finish	Visual/Comparison with comparator	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
4	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	TC

Note: 1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'

2. In 'Remarks' column abbreviation used shall be as below

IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

3. Radial Gate and Flap Gate Leaf

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Radial and Flap Gate leaf					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel-Skin plates, Horizontal Girder, Vertical Stiffeners, Radial Arm, Bracings, rest beam etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Stainless steel - Plate/Flat	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Plates	UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	2	TC
B	Bought out Items							

1	Hardware (Fasteners)	Dimension Report, Material Properties	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Rubber Seals	Make, Type, Dimension Report, Material Properties	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Bushing, Bearing	Make, Type, Dimension Report, Material Properties	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
C	In Process Inspection							
i	Edge Preparation	Visual	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
ii	Dimensional Check in Track position	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
iii	Curvature of Skin plate	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
2	Welding	Visual/Measurement	At Random	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
I	Fillet welds	DP test	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC

D	Final Inspection							
1	Profile of Skin Plate	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Dimensional Check on assembled gate	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Welding Examination	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
i	Fillet welds	DP test	10% of fillet weld	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
4	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
5	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

4. Radial Gate Trunion Assembly

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Radial Gate (Trunion Assembly)					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel-Trunion Bracket, Arms	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Cast/Forged Steel - Trunion Hub	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Plates, Cast / Forged Steel	UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	2	TC

B	Bought out Items							
1	Trunion Bush, Pin, Washer, Screws, Nuts and Bolts	Dimension Report, Material Properties	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
C	In Process Inspection							
1	Surface Defects	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
2	Fit-Up of Joints	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
3	Welding							
I	Fillet welds	DP test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
4	Post Weld stress relieving	Heat Treatment	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
5	Machining	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR

D	Final Inspection							
1	Dimensional Check	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Welding Examination	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
i	Fillet welds	DP test	10% of fillet weld	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Shop Trial Assembly (Fit up of Trunion Bush & Pin into Trunion Hub and Trunion Bracket)	Fits and clearance measurements	100 %	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
4	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
5	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

5. Hoist Support Frame

Name of Project : Heo HEP (240 MW)					OWNER/CLIENT : NEEPCO Ltd.			
Name of Equipment : Hoist Support Frame, Hoist Housing					Executing Agency :			
					W.O NO. :			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel-Channel, Angles etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Hardware- Fasteners, Washers etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	In Process Inspection							
1	Welding							
I	Fillet welds	DP test	100%	Tech. Spec/Relevant	Test Certificate	2	1	TC

				std./Approved Drgs.				
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Dimensional Checks (after machining)	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
D	Final Inspection							
1	Dimensional Check	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Welding Examination	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
i	Fillet welds	DP test	10% of fillet weld	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Shop Trial Assembly (Fit up of Trunion Bush & Pin into Trunion Hub and Trunion Bracket)	Fits and clearance measurements	100 %	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
4	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC
5	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC

Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

6. Travelling Gantry Crane

Name of Project : Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment : Travelling Gantry Crane					Executing Agency :			
					W.O NO. :			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel-- Crane Structure, Columns, Rails etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Cast/Forged Steel (Wheel, Shafts, Pins, Gears, Sheaves and Rope Drum)	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
		UT	100 %	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	Bought Out Items							
1	Electric Motors (Main Hoist & Aux. Hoist CT & LT Drive)	Make, Type, Rating & Routine Test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Electro Magnetic Brakes/Thruster Brakes	Make, Type, Routine Test and Dim. Check	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC

3	Gear Boxes	Make, Type, Gear Ratio	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
4	Misc. Item (Wire Rope, Bearing, Plummer Blocks)	Make, Type, Material Properties & Dim, Routine Test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	In Process Inspection							
1	Welding							
I	Fillet welds	DP test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Post weld heat treatment (Fabricated Rope Drum, Gear Box Housing)	Heat Tratment	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Machining (Rope Drum, Shaft, Axle, Sheaves, Brake Drums) - Dimensional Checks	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
4	Sub Assembly - Wheel Bogies Assembly, Gear Pinions & Shaft, Plummer Blocks, Gear Boxes & Motors with coupling	Alignment, Noise Level, Vibration, Gear oil leakages	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
D	Final Inspection and testing with original Control Panel							
1	BoM Check	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
1	Dimensional Check on assembled crane	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP

2	Welding Examination	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Hoist Speed - Full load	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
4	Lowering Speed - Full load	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
5	Overload Test at 125 % of rated load	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
6	Brake Test - Raising and Lowering	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
7	LT & CT Speeds	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
8	Control Panel	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
i	Cubicle Dimensions	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
ii	IR Test	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
iii	HV Test	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
iv	Functional Test & Interlocking	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
9	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC
10	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC

Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

7. Hydraulic Hoist

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Hydraulic Hoist					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Hydraulic Cylinder, Piston & Allied Parts	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC

B	Bought Out Items							
1	Seal, Spherical Bearing, Control Valves etc.	Dim Report & Material Properties	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
C	In Process Inspection							
1	Welding - if applicable							
I	Fillet welds	DP test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Post weld stress relieving	Heat Treatment	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Machining of Major Items: Cylinder, Piston Rod, Piston, End flanges etc	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
4	Hydrostatic Testing	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
5	Chrome Plating, Polishing (Piston Rod)	Visual & Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
6	Dimensions	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR

D	Final Inspection and testing with original Control Panel							
1	Welding Examination: Fillet Weld	Visual/Measurement	10%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Shop Assembly	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
i	Dimension Check	Measurement	ii100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
ii	Travel of stem at Test Pressure - Stroke Length (Smooth Operation)	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
iii	Leakage Test at Working Pressure (Hydrostatic Test)	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
iv	Max & Min Speed							
	Moving in	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
	moving out	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
v	Functional Tests: Hydraulic Interlocking	Visual	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP

3	Painting & Preservation							
i	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

8. Hydraulic Power Pack

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Hydraulic Power Pack					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Hydraulic Equipment & Accessories							
1	Pump							
i	Make	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Type	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
iii	Capacity/Rating	Visual	100%	Tech. Spec/Relevant	Test Certificate	2	1	TC

				std./Approved Drgs.				
2	Oil Filter & Pressure Filter							
i	Make	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Type	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
iii	Capacity/Rating	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Pressure gauge, Pressure Switch, Float Switch etc							
i	Make	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Type	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
iii	Capacity/Rating	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
4	Control Valves	Pressure Test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC

5	Electric Motor							
i	Make, Model & Rating	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
Ii	IR Test	Electrical	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
Iii	HV Test	Electrical	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
Iv	Full Load RPM	Electrical	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
6	Function of power pack with control cabinet alongwith piping and pipe fittings for normal and full design pressure	Functional	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
7	Oil Tank							
I	Dimensions	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
Ii	Leakage Test/Hydrostatic Test	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP

8	Pipe and Pipe Fittings							
I	Dimensions	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	Log Sheet	2	1	RR
Ii	Pressure Test	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC
9	Control Panel							
I	Verification of Material, Rating of Components	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
Ii	Overall dimensions	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
Iii	IR Test	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
Iv	HV Test	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
V	Electric Operational check	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
10	Painting	Visual	Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC

Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.

**Signature
(Owner's Representative.)**

**Signature & Seal
(Contractor)**

9. Rope Drum Hoist

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Fixed Rope Drum Hoist					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document/ Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel--Base Frame, Girders, Columns	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC

2	Cast/Forged Steel (Rope Drum, Shaft, Pulleys, Gear & Pinions)	Chemical and Mechanical Properties	Sample	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
		UT	100 %	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	Bought Out Items							
1	Wire Rope, Coupling, Plummer Block, EM/Thruster Brake	Make, Type, Size, Dim., Mat. Properties	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Control Panel-Components	Make, Type, Size, Dim., Mat. Properties	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Electric Motor	Make, Type, Routine Test and Dim. Check	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
4	Gear Boxes	Make, Type, Gear Ratio	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	In Process Inspection							
1	Welding							
I	Fillet welds	DP test	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC

ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Post weld heat treatment (Fabricated Rope Drum)	Heat Treatment	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
3	Machining (Rope Drum, Shaft, Axle, Sheaves, Brake Drums) -Dimensional Checks	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
4	Sub Assembly - Rope Drum and Drive mechanism on Base Frame	Alignment, Noise Level, Vibration, Gear oil leakages	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
D	Final Inspection and testing with original Control Panel							
1	BoM Check	Visual	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Dimensional Check on complete assembly	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Load Test at SWL	Visual/Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
6	Overload Test at 125 % of SWL load	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
7	Brake Test - Raising and Lowering	Visual	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP

8	Lifting Speed at rated load	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
13	Functional Test & Interlocking	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
14	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
15	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

10. Lifting Beam

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Lifting Beam					Executing Agency:			
					W.O NO. :			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	Bought Out Items							
1	Lifting Hook, Lifting Pin, Bushes, Side Rollers etc.	Chemical and Mechanical Properties, Dim Report	Test	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Lifting Hook-Proof Load Testing	Test	Test	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	In Process Inspection							

1	Welding							
I	Fillet welds	DP test	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
ii	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec./Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Dimensional Check on complete assembly	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	IR	2	1	RR
D	Final Inspection							
1	Assembly Dimension	Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Welding Examination - Fillet	DP Test	Random	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Vertacilaty of Lifting Beam	Visual/ Measurement	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
4	Functional Test - Automatic Engaging & Disengaging of Lifting Hooks	Visual	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	1	CHP
5	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC

6	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec./Relevant std./Approved Drgs.	TC	2	1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/Sub-Contractor'							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

**Signature
(Owner's Representative.)**

**Signature & Seal
(Contractor)**

11. Trash Rack

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.			
Name of Equipment: Trash Rack					Executing Agency:			
					W.O NO.:			
S. No	Activity / Operation	Nature of Check	Quantum of check	Reference document/ Acceptance Norms	Format of Record	INSPECTION AGENCY		Remarks
						Perform	Verify	
A	Raw Material							
1	Structural steel - Plates, Channels, Flats Beams etc.	Chemical and Mechanical Properties	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
B	Bought Out Items							
1	Hardware (Fasteners)	Chemical and Mechanical Properties, Dim Report	Sample	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
C	In Process Inspection							
1	Steel Plates							
i.	Edge Preparation	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
ii	Dimensional Check	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
iii	Fillet welds	DP test	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC

iv	Full Strength (Butt Weld)	RT/UT	100%	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2	1	TC
2	Machining	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	IR	2	1	RR
D	Final Inspection							
1	Dimensional Check with Template	Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
2	Welding Examination -Fillet	DP Test	Random	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	1	CHP
3	Surface Finish	Visual/Comparison with comparator	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC
3	Girt Blasting and Painting	Surface finish Visual/Measurement (DFT)	At Random	Tech. Spec/Relevant std./Approved Drgs.	TC	2	1	TC
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2 'Contractor/SubContractor'							
	2. In 'Remarks' column abbreviation used shall be as below IR- Internal Record, RR- Review of Report & TC- Test certificate, CHP- OWNER/CLIENT Hold Point.							

Signature
(Owner's Representative.)

Signature & Seal
(Contractor)

12. Penstock Steel Liner

Name of Project: Heo HEP (240 MW)					OWNER/CLIENT: NEEPCO Ltd.				
Name of Equipment: Penstock Steel Liners					Vendor:				
					Agreement No.:				
S. No	Activity/ Operation	Nature of Check	Quantum of check	Reference document / Acceptance Norms	Format of Record	INSPECTION AGENCY			Remarks
						Perform	Witness	Verify	
I	Raw Material								
1	Plates	Chemical and Mechanical Properties	1/Heat	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2/3	3	1	TC
2	NDT of Steel Plates	UT	1/Heat	Tech. Spec/Relevant std./Approved Drgs.	Test Certificate	2/3	3	1	TC
3	Hardware	Dimensional and Material Properties	100 %	~do-	Test Certificate	2/3	3	1	TC
II	In Process Inspection								
1	Surface defect	Visual	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR/Log Book	2	3 & 1		CHP
2	Plate Rolling & Assembly	Visual/Measurement	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR/Log Book	2	3 & 1		CHP

3	Edge Preparation & Fit Up	Visual/Dimensional	100%	Tech. Spec/Relevant std./Approved Drgs.	JIR/Log Book	2	3 & 1		CHP
4	Welding Examination (Shop Welding)								
(i)	Fillet	D P test	100% of fillet Weld length	Tech. Spec/Relevant std./Approved Drgs.	IR	2	3	1	RR
(ii)	Charpy "V-Notch" impact test at -40 degree	Weld Notch toughness	Sample	Tech. Spec/Relevant std. /Approved Drgs.	TC	2	3	1	TC
5	Pre heat as per WPS	Measurement	100%	Tech. Spec/Relevant std. /Approved Drgs.	IR	2	3	1	RR
6	Post Weld Heat treatment as per WPS	Measurement	100%	Tech. Spec/Relevant std. /Approved Drgs.	IR	2	3	1	RR
III	Final Inspection (Shop)								
1	Dimensional Check of individual Liner	Measurement	100%	Tech. Spec/Relevant IS Code/Approved Drgs.	JIR	2	3 & 1		CHP
2	Welding Examination (Shop Welding)								
(i)	Fillet	D P test	10%	Tech. Spec/Relevant	JIR	2	3 & 1		CHP

				std./Approved Drgs.					
(ii)	Butt Weld								
a.	Circumferential weld	RT	100 %	Tech. Spec/Relevant std./Approved Drgs.	JIR	2	3 & 1	1	CHP
b.	Longitudinal weld	RT	100%	Tech. Spec/Relevant std. /Approved Drgs.	JIR	2	3 & 1	1	CHP
3	Hydro Test	Leakage & Adequacy of liner	100%	Tech. Spec/Relevant std. /Approved Drgs.	JIR/Log Book	2	3 & 1	1	
4	Painting	Visual & Measurement (DFT)	10%	Tech. Spec/Relevant IS Code/Approved Drgs.	JIR	2	3 & 1	1	CHP
IV	Site Inspection (Field Erection)								
1	Site Assembly	Visual & Dimensional Check	100 %	Tech. Spec/Relevant IS Code/Approved Drgs.	JIR	2	3 & 1		CHP
(i)	Ferrules	Visual & Dimensional Check	100%	Tech. Spec/Relevant IS Code/Approved Drgs.	JIR	2	3 & 1		CHP
(ii)	Specials								

2	Welding Examination (Site)								
(i)	Fillet	D P test	10 %	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	3 & 1		CHP
(ii)	Butt Weld								
a.	Circumferential weld	UT	100%	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	3 & 1		CHP
		MPT	100 %	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	3 & 1		CHP
C	T-Joints (Covering 100 mm on either side of Junctions)	RT	100 %	Tech. Spec./Relevant std./Approved Drgs.	JIR	2	3 & 1		CHP
Note:	1. In 'Inspection Agency' column figure 1 will indicate 'NEEPCO' 2will indicate 'Contractor/Sub-Contractor', 3- will indicate 'Third party' of contractor.								

**Signature
(Owner's Representative.)**

**Signature & Seal
(Contractor)**