

एसजेवीएन अरूण-3 पाँवर डवलपमेंट कंपनी प्रा. लि.
SJVN Arun-3 Power Development Company Pvt. Ltd.

(एसजेवीएन की पूर्ण स्वामित्व वाली अधीनस्थ कंपनी)

(A wholly owned subsidiary of SJVN)

900 मेगावाट अरूण-3 जलविद्युत परियोजना

900 MW Arun-3 Hydro Power Project

Regd. No.: 111808/69/070



PRESS NOTICE

Tender No.: ICB-P&C-AHEP-HM-C-5/2023-90

Date: 10.02.2023

SAPDC invites bids on **Open Tender Basis** from eligible Indian/Nepali Bidders through E-portal <https://etender.sjvn.co.in/SRMLogin/SRMLogin.jsp>, for construction of following Hydro-Mechanical Works:

Contract Package Number	Description of Work	Cost of Bid Document	Bid Security	Completion Period
C-5	Hydro-mechanical Works - Pressure Shaft Steel Liner of Arun-3 HEP.	INR10,000/- (Indian Rupees Ten Thousand only) OR NPR16,000/-/- (Nepalese Rupees Sixteen thousand only)	INR 1,60,00,000/- (Indian Rupees One Crore Sixty Lakh only) OR NPR 2,56,00,000/- (Nepalese Rupees Two Crore Fifty Six lakh only)	9 Months

Last date for submission of bids is **02.03.2023 upto 1700 hrs** and opening of bids is **03.03.2023 at 1100 Hrs.**

The Bidding Documents can be downloaded from websites: www.sapdc.com.np, www.sjvn.nic.in & www.eprocure.gov.in and shall be available **w.e.f. 10.02.2023.**

Further, Amendments/Corrigendum /Notification (if any) shall be issued only on above website.

Chief Engineer (P&C)

**SAPDC, Satluj Bhawan,
Tumlingtar, Distt. Sankhuwasabha, Nepal
Ph. +977-29-575154, 9852099789
E-mail Address: pnc.sapdc@gmail.com**

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NOTICE INVITING TENDER - SINGLE STAGE TWO PART ENVELOPE BIDDING

Tender No. : ICB-P&C-AHEP-HM-C-5/2023-90

Date: 10.02.2023

1. SJVN Arun-3 Power Development Company(P) Ltd. (SAPDC), a company promoted by SJVN Ltd. as a single shareholder company in Nepal, having its registered office at Lokanthali, Kathmandu, Nepal (here-in-after referred to as “Employer”) has signed Project Development Agreement with Government of Nepal to plan, promote, organize & execute Arun-3 Hydroelectric Project (900 MW) in Sankhwasabha District. of Nepal on Build, own, operate and transfer (BOOT) basis (here-in-after referred to as “PDA”).
2. SAPDC invites bid for execution of Works/Facilities, as summarized herein below and described in Bid Document, hereinafter referred to as the “Works”. The bids shall be submitted offline as under:

Contract Package Number	Description of Work	Cost of Bid Document (INR)	Bid Security	Completion Period (Months)
C-5	Hydro-mechanical Works - Pressure Shaft Steel Liner of Arun-3 HEP	INR10,000/-(Indian Rupees Ten Thousand only) OR NPR16,000/-/- (Nepalese Rupees Sixteen thousand only)	INR1,60,00,000/- (Indian Rupees One Crore Sixty Lakh only) OR NPR 2,56,00,000/- (Nepalese Rupees Two Crore Fifty Six lakh only)	9 Months

3. This invitation to bid is open to (i) all the bidders from India Or (ii) Joint Venture/Consortium of Indian firms Or (iii) Joint Venture/Consortium of Indian and Nepalese firms (with Indian firm as lead partner) who meet the minimum Qualification Criteria.
4. Bidders should not have been banned/ de-listed/ black listed/ debarred from business by Government of Nepal or any of its Government Department during last 03 (three) years on grounds of corrupt/fraudulent practices and/or due to non-performance and/or by Ministry of Power, Government of India / SJVN / SAPDC on any grounds and whose scope of work has been deleted by SJVN /SAPDC.
5. The no. of JV partners allowed for bidding is two.
6. The minimum qualifying requirements are as under:

Technical Criteria

7.1 General Experience

Applicant (Prime contractor or as partner in a JV/Consortium or Sub-contractor approved by the respective employer) should have executed at least one Hydro-Mechanical work of contract value INR 76 Crore or more during the preceding twenty (20) years to be reckoned from the last day of month previous to the month in which applications are invited and which are in successful operation. In case of ongoing projects, the value of completed work shall be considered.

7.2 Technical Criteria (Specific Experience)

Applicant either itself or proposed Manufacturer(s), who have given authorization to the Applicant, should have experience in the design, procurement fabrication, shop assembly, painting, shop testing, supply, transportation, erection, testing and commissioning of the following Hydro-Mechanical works and pressure shaft steel liner works in a completed project during the preceding twenty (20) years to be reckoned from the last day of month previous to the month in which applications are invited.

a) Pressure shaft Steel liner

Fabrication/manufacturing, erection, testing and commissioning of one no. pressure shaft steel liner having a value of $D \times H$ not less than 1000 m² Where, D = Internal diameter expressed in m and H = maximum Design Head in (m).

Experience of Supervision of erection, testing and commissioning of applicant shall also be considered at par with own erection, testing & commissioning of HM equipment and pressure shaft steel liner works.

The prime contractor or as partner in a JV or sub-contractor approved by the respective employer should have completed the works with specified criteria mentioned above in a single project or each one in different projects during the last twenty (20) years.

7.3 Financial Criteria:

i) Submission of audited balance sheets or if not required by the law of Applicant's country, other financial statements acceptable to the Employer, for the last 5(five)years to demonstrate:

(a) the current soundness of the applicant's financial position and its prospective long term profitability. The net worth shall be positive for the last three financial years which shall be calculated based on subscribed and paid up Share Capital plus Share Premium plus Free Reserves plus Unallocated Balance/ Surplus amount of Profit and Loss Account, less (a) Expenses not written off, (b) Accumulated losses in Profit and Loss Account, if not reduced from reserves and surplus. The Revaluation reserves, Capital Reserves and amount of intangible assets like goodwill etc. will not be taken into account while calculating Net Worth, and

- (b) capacity to have a cash flow amount (working capital) of at least INR 50 Crore or equivalent as evident from the last audited annual report or banking reference(s) as the case may be.

Notes:

- a. Banking reference(s) should contain in clear terms the amount that the Bank will be in a position to lend for this work to the applicant/ member of the Joint Venture. In case the Net Working Capital (as seen from the Balance Sheet) is negative, only the Banking reference(s) will be considered, otherwise the aggregate of the Net Working Capital and submitted Banking reference(s) will be considered for working out the working capital.
 - b. The Banking reference(s) should be from a "A" Class Nepalese Bank/Scheduled Bank of India and it should not be more than 3 months old as on the date of submission of applications.
 - c. In case of JV- requirement of working capital/net cash flow is to be distributed between members as per their percentage participation and every member should satisfy the minimum requirement for his portion.
- ii) **Average Annual Turnover:** Minimum Average Annual Turnover* (MAAT) for best three Financial years out of last five financial years of the bidder should be INR 76 Crore or equivalent, calculated as total certified payments received for contracts in progress or completed.

Note: The average annual turnover of JV will be based on percentage participation of each member.

General Notes for Financial Situation:

- i. The number of partners in case of Joint Venture including lead partner shall not be more than Two (2). The lead partner must be Indian having minimum 51% participation in the JV/JVA and other partner shall have minimum 20% participation. Partner having less than 20% participation in the JV will be termed as non-substantial partner and will not be considered for evaluation of financial criteria which means that their financial soundness shall not be considered for evaluation of JV. In that case, the left out requirement shall be met out by the lead partner of JV in addition to his own requirement specified in the QR and over all JV should meet the 100% requirement.
- ii. Sub-contractors turnover shall not be considered
- iii. Turnover of the applicant/partner from the related business shall only be taken into consideration for purpose of evaluation. In case Turnover from related business is not shown separately in the financial statements, a certificate from Chartered Accountant certifying Turnover from related business shall be submitted.
- iv. Annual Report along with audited Balance Sheets, Profit & Loss Accounts, the schedules and other Financial Statements of the immediately

preceding 5(five) years of the Applicant should be furnished by the Applicant for checking and evaluating their Financial Capacity vis-à-vis the requirement stipulated hereinabove.

In case, if the Bidder has not submitted the above Annual Report along with the Bid, then a certificate from CEO/CFO of the Bidder shall be submitted along with Bid mentioning that the requirement of Annual Report as per governing law of country is not mandatory. In such cases duly notarized copies of Audited Printed Annual Financial Statement (Balance Sheet, Profit & Loss Statement, cash flow statement, Auditor's Report thereon including all relevant schedules/ annexure etc.) for the immediately preceding 5(five) years be submitted by the Bidder along with the Bid.

- v. In case where Audited financial results for the immediately preceding year are not available, then a statement of account as on the closing date of the immediately preceding financial year depicting the Turnover, Net Worth {calculated as per laid down criteria under para 9.3 (i) (a)} duly certified by their Statutory Auditor/ Certified Public Accountant carrying out the Statutory Audit shall be enclosed with the bid along with copy of appointment letter of the Statutory Auditor.
- vi. Wherever, the Annual Report/ duly notarized copies of Audited Printed Annual Financial Statement are in language other than English, then copy duly translated & printed in English language and certified by approved/ recognized English translator shall be submitted with the Bid.
- vii. For conversion from INR to NPR and vice versa, a factor of 1.6 will be considered.

7.4 Bid Capacity

The available Bid capacity of the Bidder at the time of submission of price bid, calculated as under should not be less than INR 151 Crore.

Available Bid capacity = $2.0 \times A \times N - B$

Where;

A= Maximum value of Works executed in any one year during last 3 years

N = Number of years prescribed for completion of the subject contract package

B = Value of existing commitments (as on bid submission date) and on-going works to be completed in next "N" years.

The Bidder shall submit documentary evidence together with a certificate from its statutory auditors in support of establishing 'A' and 'B' above, along with their Bid.

- 8. The Employer will award the contract to the Bidder, meeting the specified qualifying requirement and also whose Bid has been determined to be substantially responsive to the Bid Documents and who has offered the lowest bid price in pursuance to the bidding conditions.

9. Bidders may visit for bid submission and uploading the bid on portal <https://sjvn.nic.in>, under the “Tender Management” then click on “e–Tendering and Reserve auction portal ” or directly at E-portal page <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp>. The interested Bidders can download the Bid Document from websites: **www.sapdc.com.np, www.sjvn.nic.in & www.eprocure.gov.in.** and shall be available w.e.f. 10.02.2023 (1700 Hrs.). Further, Amendments/Corrigendum /Notification (if any) shall be issued only on above mentioned websites.
10. The key particulars/details and dates of this invitation are as under :

<p>Date and time for availability/ downloading of Bid document on web sites: www.sapdc.com.np, www.sjvn.nic.in & www.eprocure.gov.in</p>	<p>: 10.02.2023 (1700 Hrs.) to 01.03.2023 (1700 Hrs).</p>
<p>Tender Document Cost</p>	<p>INR10,000/-(Indian Rupees Ten Thousand only) OR</p> <p>NPR16,000/--(Nepalese Rupees Sixteen thousand only) in the form of Manager’s cheque in favour of “SAPDC-NPR CONSTRUCTION ACCOUNT”</p> <p>Alternatively, payment against Cost of Tender Document may be made directly in the bank account of SAPDC as mentioned below: -</p> <p>NPR Account Details: Name of Bank: Everest Bank Limited, Nepal Name of beneficiary: “SAPDC-NPR CONSTRUCTION ACCOUNT” Acc. No. 00800105200477 Swift Code: EVBLNPKA</p> <p>*Bidder shall be responsible to ensure the receipt of net amount (excluding bank transfer charges) in the account before last date of submission of bid. Further, the bidder shall submit the copy of receipt in Envelope/Cover (Part -I) of the bid.</p>
<p>EMD/ Bid Security (Clause 18.0 of ITB)</p>	<p>Refer complete instructions at Clause No. 18.0 of ITB:</p> <p>INR 1,60,00,000/- (Indian Rupees One Crore Sixty Lakh only) OR</p>

	<p>NPR 2,56,00,000/- (Nepalese Rupees Two Crore Fifty Six lakh only)....</p> <p>*Bidder shall be responsible to ensure the receipt of net amount (excluding bank transfer charges) in the account before last date of submission of bid. Further, the bidder shall submit the copy of receipt in Envelope/Cover (Part -I) of the bid.</p>
<p>Clarification on bid document (if required). Last date for receiving request for clarifications from Bidders at email address pna.sapdc@gmail.com. The Pre bid meeting (if required) may also be held, for which the separate notification shall be issued on websites mentioned below:</p>	<p>The bidders may submit their queries for clarifications on Bid Document through e-mail, up to 15.02.2023 (1700 Hrs) only, which shall be responded to and clarified as per clause 11.0 of ITB.</p>
<p>The subsequent amendment/corrigendum/addenda shall be issued and displayed on websites only :</p>	<p>www.sapdc.com.np, www.sjvn.nic.in & www.eprocure.gov.in. (i.e. under respective NIT)</p>
<p>Deadline for submission of bid & Venue.</p>	<p>Online & Offline Submission: up to 02.03.2023 (1700 Hrs.)</p> <p>In the office of Chief Engineer (P&C), SAPDC, Satluj Bhawan, Tumlingtar, Distt. Sankhuwasabha, Nepal, Ph. +977-29-575154, 9852099789</p> <p style="text-align: center;">OR</p> <p>In the Office of Company Secretary, SJVN Arun- 3 Power Development Company (SAPDC) at 3rd floor, Citizen Investment Trust (CIT) Building, New Baneshwor, Kathmandu, Nepal, wherein the bids shall be received only till two days prior to the last date for submission of bids. Contact No: +977 9819822967</p>
<p>Date & time for Bid opening</p>	<p>Techno- Commercial Bid (Part--I): Online &</p>

	<p>offline Bid opening on 03.03.2023 at 1100 Hrs.</p> <p>Price Bid (Part--II) : Online bid Opening shall be notified later on, separately on following websites: www.sapdc.com.np, www.sjvn.nic.in/tender.htm, & www.eprocure.gov.in (Only i.r.o. the bidders meeting the specified qualifying criteria and also whose Techno-Commercial Bids are found responsive).</p>
Venue for opening of bid	<p>O/o Chief Engineer (P&C) SAPDC, Satluj Bhawan, Tumlingtar, Distt. Sankhuwasabha, Nepal</p>

11. For any enquiry with respect to project site, site visit etc. the Bidder may contact the following person :

Sl. No.	Designation	Address	Phone No.
(i)	Chief Engineer (HM)	Hydro Mechanical Deptt., SAPDC Office Complex, Tumlightatr, Distt. Sankhuwasabha, Nepal.	MobNo.+977 9852099735 Email: sapdcp3@gmail.com

12. For any enquiry/clarification for registration, submission of Bids and any other information, the Bidder may contact the following person:

Designation	Address	Phone No.
Chief Engineer (P&C)	SAPDC, Satluj Bhawan, Tumlingtar, Distt. Sankhuwasabha, Nepal	Ph. +977-29-575154, 9852099789 E-mail Address: pnc.sapdc@gmail.com

13. For any enquiry/clarification for registration, e- tendering system linked with technical issue/support, the Bidder may contact the following person:

Name/Designation	Address	Phone No.
Contact Person:	-	Ph no:
Mr. Digvijay Kamta		+91 9129989000
Sanjaya Bhatnagar		+91 9456119194

12. All correspondence with regard to the above shall be made at the following address :

Chief Engineer (P&C)

**SAPDC, Satluj Bhawan,
Tumlingtar, Distt. Sankhuwasabha, Nepal
Ph. +977-29-575154, 9852099789**

E-mail Address: pnc.sapdc@gmail.com

PROJECT PROFILE AND SCOPE OF WORK

1.0 LOCATION

Arun-3 HPP is located on River Arun, which is one of the main tributaries of River SaptKosi near Num village of Sankhuwasabha District in Nepal. The Project has been contemplated as a run-of-river scheme which envisages about 70 m high concrete gravity dam.

The project is located at Latitude 27°30'N to 27°35'N and Longitude 87°12'E to 87°20'E. Jogbani, Distt. Bihar, India is the nearest rail head to the project. All rail freight for Nepal has to be unloaded there. From Jogbani, the road distance to the project sites via Biratnagar, Nepal is about 300 km. The dam site is located at about 60km from Tumlingtar, where exists an airstrip connected to Kathmandu/Biratnagar by half an hour journey by air.

2.0 BRIEF SCOPE OF WORKS

Generally, this contract comprises, but is not necessarily limited to works and responsibilities associated with the execution and performance by the contractor of the following principal features, all of which are described in details in the bidding documents but are summarized here in for convenience:

The specifications described herein-under cover procurement, fabrication, shop assembly, painting, testing, transportation, supply, erection, site testing and commissioning of pressure shaft steel liner as per general layout drawing no. ARUN-III HEP/PSL/1200 (sheet 1 & sheet 2), ARUN -III HEP/PSSL/1218A (sheet 1 ,sheet 2,sheet 3 & sheet 4) at site complete in all respects, for Arun-3 Hydroelectric project, in accordance with these technical specifications and specification drawings. The materials, workmanship, technical requirements, equipment, accessories, supplies and services required, shall be as set forth in these technical specifications.

The scope of work also covers supervision of unloading, stacking, operation, storage and preservation of components of pressure shaft steel liner and its accessories in the stockyards of the contractors at the project site before they are transported, installed, tested and commissioned at their respective sites.

The various items involved in the scope of work mentioned herein shall generally consists of the following but not necessarily be restricted to:

- i) Two (2) sets of pressure shaft steel liner of dia. 5500mm, bifurcations (2 Nos), branches (4 Nos) of dia. 4000mm and their accessories, complete in all respects.
- ii) One (1) set of inspection trolley having a load carrying capacity of 5 MT and capable of dismantle and taken through 600mm dia. Manhole and assembled inside the pressure shaft along with suitable capacity winch complete in all respects.
- iii) Two (2) sets of rail tracks inside the pressure shaft for facilitating erection of steel liner, concreting, inspection, etc. complete in all respects.
- iv) Radiographic examination of the weld.

- v) Ultrasonic examination of the weld.
- vi) Measuring instruments:
The following instruments shall be supplied and installed by contractor for this work:
 - a) Two (2) sets of discharge measuring instrument suitable for high turbidity water for measuring discharge in pressure shaft.
 - b) One (1) set of recorders of water level in surge shaft.
 - c) Four (4) Nos. of pressure taps on each shaft at approx. 2D upstream and 6D downstream from Centre of butterfly valve for measuring pressure.
- vii) 5 (five) sets (4 hard copies and 1 soft copy with indexing) of operation and maintenance (O&M) manuals containing drawings etc.
- viii) 4 (four) sets (3 hard copies and 1 soft copy) of abridged manufacturing history records and inspection & test records for all equipment to be supplied under scope of work.
- ix) 2 (two) sets (1 hardcopy and 1 softcopy) of erection & commissioning documents for pressure shaft steel liner and accessories.

3.0 TRANSPORTATION AND COMMUNICATION FACILITIES

The following information/data is being provided by SAPDC in good faith. Applicant/contractor should check for themselves during preparatory site visit as to the correctness of information/data.

3.1 Transportation

To reach the sites of Arun-3 HPP, Khandbari, Nepal the nearest broad gauge railway station is Jogbani, Bihar (India) and further by road up to Khandbari/Tumlingtar is about nearly 252/238 Km. Jogbani in Bihar is a city of India with Nepal border and is just 6.00 Km. from Biratnagar (a major industrial town of Nepal).

Road conditions in different road segment en-route are as under:-

- i) Jogbani to Hile:-Hile is located at a distance of 124 Km from Jogbani and the existing road up to Hile is black topped road and in good condition. Hile is at EL 1920m from sea level.
- ii) Hile to Tumlingtar (Hill road route) :- This route is about 114 Km and the road partially is black topped and partially kuchha up to Chainpur (69Km, EL 1285m) and Chainpur to Tumlingtar (45Km) is black top .
- i) Tumlingtar to Khandbari (14 Km): Khandbari is about 14 Km from Tumlingtar and road is metalled.
- ii) Khandbari to Powerhouse site (about 46 Km): The farm road from Khandbari to Chainkutty (17km) and from Chainkutty to Diding (Powerhouse site).

An alternate road is also available from Hile to Tumlingtar via Leguwa, which is known as "River Road Route". The partial road is provided with WBM and minor widening at some curves is required. This road gets blocked during rainy season. From Leguwa to Tumlingtar.

iv) Tumlingtar is also connected to Kathmandu by air around half an hour journey.

Generally, the district / state or national highway roads/ access roads get blocked temporarily due to landslides, slips, sinkage of ground etc. The blockade becomes more frequent during rainy season. Such constraints shall not be considered unforeseeable.

Note: Since this is the General information for the bidders regarding transportation, the bidders shall require to confirm present road conditions by conducting site visit at their own.

3.2 Communication

At present, no communication signal (Mobile/landline) is available at dam site, however, in certain locations, very weak signal of Nepal Telecommunication Corporation (NTC), CDMA is available. Proper mobile signal of NTC and NCELL is available upto bifurcation point at Chaikutty (about 39km from dam site). The district headquarter at Khandbari is well connected with mobile, landline and internet connectivity.

4.0 TOPOGRAPHY & PHYSIOGRAPHY

- Most of the Tibetan part of the Arun River basin is formed by highland above elevation 4500 m and is surrounded by high mountains, characterized by glacial or periglacial landforms. It covers an area of about 26747 km². The Nepalese drainage area up to the dam site is about 400 km². The average bed slope is about 0.8% in the upper catchment of Tibet, and increases drastically to 3-4% towards the Tibetan-Nepalese border, and in Nepal. The project area/ activity mainly lie in between EL 950 m to EL 500 m above mean sea level.
- Soil in the area, is calciformic known as "Brown forest Soil" with high calcium in the parent material from which it is developed. The sub-soil is generally whitish grey in colour and calcareous in nature. There is hardly any horizon differentiation. The soils in borrow and camp area are very deep and granular due to presence of high exchangeable calcium. "B" horizon is brownish sometime reddish brown.

5.0 SEISMICITY:

The project lies in seismic zone V as per IS 1893:2002.

6.0 POWER EVACUATION ASPECTS

400 KV D/C circuit line with moose conductor from Arun3 HEP to Muzaffarpur via Dhalkebar 400/220 KV substation quad line -310 Km.

7.0 ENVIRONMENT ASPECTS

Nepal has developed an extensive set of legislation for regulating the environmental and social aspects for developmental projects. Nepal's laws and relevant legislation on environment conservation and social aspects including major provisions for Nepal Environmental Policy and Action Plan (NEPAP), 1993, Soil and Watershed Conservation Act, 1982, Forest Policy, 1993, Forest Act, 1993, Forest Rules, 1995, Forest Produce Collection and Sales Distribution Guidelines, 2001, The Aquatic Animal Protection Act, 1961, National Parks and Wildlife Conservation Act, 1973 and Rules, Explosive Material Act (2018 BS), Land Acquisition Act, 1977, Guthi Corporation Act, 1976 (2033 BS), Land Acquisition Guidelines 1989 and Land Reform Act 1964 (2021 BS)

8.0 CONSTRUCTION POWER

The Contractor shall make all arrangements for the full anticipated requirement of construction power through relevant authorities or by installing diesel generating sets. No additional cost on account of this shall be paid to contractor.

The Contractor shall bid his price considering the above.

Permission from Government authorities, if required, for above construction power and operation thereof shall be arranged by the Contractor at his own cost.

9.0 OTHERS / MISCELLANEOUS

- i) **General Climatic Condition in the Project Area :** The climate of the area is monsoonal in nature, as about 70% of the annual precipitation is received in the months from June to September. Since, Arun river basin lies within Eastern Himalayan region, where the monsoon has a more extended regime, rainfall is received throughout the year.
- ii) **Port Facilities :** Nearest port at Kolkata, India (about 600km from Joghani).
- iii) **Availability of Land to the Contractor :** Land for Infrastructure shall be arranged by the Contractor himself at his own cost.
- iv) **Drinking Water Arrangement:** Natural sources available.
- v) **Medical facilities :** District HQ of Sankhuwasabha at Khandbari
- vi) **School :** NUM (Dam site), Dadagaon (PH site) and District HQ of Sankhuwasabha at Khandbari
- vii) **Bank :** District HQ of Sankhuwasabha at Khandbari
- viii) **Inner line permit / pass required for contractors and his workmen:** As per Law of Land
- ix) **Availability of nearest fuel station :** Tumlingtar and District HQ of Sankhuwasabha at Khandbari
- x) **Manpower :** Population is very thin. Total population of District Sankhuwasabha is approx. 1,50,000 (Census 2011 of Nepal)
- xi)

13.0 FACTORS INFLUENCING CONSTRUCTION

The following major constraints may be faced during the execution of the project for which employer shall assume no responsibility and shall be considered as foreseeable.

- a. Remote location of the project involving long road transport.

- b. Very high precipitation in the project region particularly during monsoon season which extends from June to September. The road network and other infrastructure are seriously affected (due to landslides, flood and breaching of roads) during monsoon season leading to disruption of normal activities.
- c. Frequent landslides and blockade of highway and other approach roads including restrictions on the bridges.
- d. Frequent power failures, voltage fluctuations and poor quality of power available.
- e. Poor quality of communication.
- f. Floods, cloud bursts etc.

Besides the above constraints which have been informed to the bidders in good faith, the bidders should ascertain for themselves during their preparatory site visit about the extent of the above constraints and other constraints/obstructions likely to be encountered.

14.0 CONSTRUCTION PERIOD

The entire works of this package is proposed to be completed within a time span of 9 (Nine) months

15.0 SALIENT FEATURES:

ARUN-3 HEP (900 MW) ,NEPAL		
SALIENT FEATURES		
1.	Location	
	River	Arun, a tributary of Kosi River in Eastern Nepal
	District	Sankhuwasabha
	Nearest Railway Head	Jogbani, Bihar (B. Gauge) about 300 km from project site
	Nearest Airport	Tumlingtar, Nepal 70 km
2.	Hydrology	
	Catchment Area at Diversion Site	26747 sq.km
	Design Flood	PMF-8880 cumec GLOF-6830 cumec
3.	Reservoir	
	Submergence area at FRL	66.3 Ha
	Reservoir Capacity/ Gross storage at FRL	13.94 MCM
	Full Reservoir Level (FRL)	El. 845 m
	Max. Water Level (MWL)	El. 847.73 m

	MDDL	El. 835 m
	Inactive Storage (below MDDL)	8.29 MCM
	Active storage /Peaking volume	5.65 MCM
4.	Diversion Tunnel	425 m long, 11 m diameter to divert 1300 cumec
5.	Dam	
	Type of Dam	Concrete Gravity Dam
	Dam top Level	El. 849 m
	River bed Level	El. 790 m
	Dam Height above River bed	59 m
	Deepest Foundation Level	El. ±769 m
	Height above deepest Foundation Level	80 m
	Length of Dam at Top	233 m
	Top Width of Dam	7 m
6.	Upstream Cofferdam	
	Type	Concrete dam
	Top level	El. 817.00 m
	Height	26 m
	Length	120 m
7.	Downstream Cofferdam	
	Type	Rock fill dam
	Top level	El. 797.50 m
	Height	8.5 m
	Length	92 m
8.	Spillway	
	Design Flood	PMF-8880 cumec GLOF -6830 cumec
	Energy Dissipation System	Trajectory Bucket type
	i)Sluice spillway No. Size	5 9.0 m (W)X 14.85 m (H)
	ii)Overflow spillway No. Size	1 5.0 m (W)X 5.0 m (H)

	Crest Level	El. 795 m-Sluice type El. 842 m-Overflow spillway		
9.	Power Intake			
	No. & Type	2 Nos., Straight intake with bell mouth		
	Invert Level	El. 819m		
	Top Level	El. 849m		
10.	Intake Tunnels			
	No. & Type	2 Nos., 7 m diameter, horse-shoe shaped		
	Length	237.895m		
	C.L. of Intake Tunnel	El. 822 m		
11.	Head Race Tunnel			
	Size	9.5 m diameter		
	Length of Tunnel	11769.615 m		
	Design Discharge	344.68 cum / sec		
	No. of Adits & size	4 Nos., 7 m X 7 m D - shaped		
	ADIT	ADIT LENGTH	RD OF HRT	DISTANCE BETWEEN ADITS
	1	647.000 m	1052.510 m	
	2	742.450 m	5148.200 m	4095.69 m
	3	387.030 m	8204.849 m	3056.82 m
	4	315.984 m	11718.345 m	3522.39 m
12.	Surge Shaft			
	Size & shape	Open to sky, Restricted Orifice 1No., 24.0m diameter, Circular		
	Height	155.00 m		
	Top Level	El. 946.00 m		
	Gates, No. & Size	2 Nos., 5.5m (W)X 5.5m (H)		
13.	Butterfly Valve Chamber- Underground			
	Size	83.05 m (L) X 12 m (W) X 21 m (H)		
	Butterfly Valve	2 nos., 5.5 m diameter		

14.	Pressure Shaft		Underground, 2 Nos.	
	Type & Size		Circular, each 5.5 m dia bifurcating into two nos. of 4.0 m diameter to feed four units	
	Length of pressure shafts 1 and 2			
	Pressure shaft-1	431.937 m	Pressure shaft-2	404.442 m
	Branch 1	70.650 m	Branch 3	70.650 m
	Branch 2	58.150 m	Branch 4	58.150 m
15.	Power House Complex			
	Type		Underground on left bank	
	P/H Cavern		179.50 m (L)X22.5 m (W)X53.0m (H)	
	Design Head (net)		286.21 m	
	Gross Head		307.67 m	
	Turbine		4 Nos., Vertical Francis turbine, 225 MW each	
	Rated speed of Turbine		250 rpm	
	Generation voltage		15.75 kV	
	Service Bay Floor Level		El. 539.00 m	
	Generator Floor Level		El. 534.00 m	
	Turbine Floor Level		El. 529.00 m	
	Distribution Centre Line Level		El. 525.00 m	
	MIV Floor Level		El. 520.50 m	
	Normal Tail Water Level		El. 536.21 m	
	Transformer		Single phase, 12+1 (Spare), 92 MVA 15.75 kV/420/ $\sqrt{3}$ kV	
16.	Transformer Hall			
	Size		146.14 m (L)X 16 m (W)x 23 m (H)	
	Transformer Hall Floor Level		El. 552 m	
	Design Discharge per unit		86.17 Cumec	
	Design Energy in a 90 % dependable year		3924.03 MU	
	Annual Load Factor		50.98 %	
	Weighted average efficiency of TG Set		93 %	
17.	Tail Race Tunnel			

	No., Type & Size	10.00 m dia 399 m long
18.	Switchyard	
	Elevation	El 557 m
	Size	160 m (L)X 80 m (W)

INSTRUCTIONS TO BIDDERS, BID DATA& QUALIFICATION FORMS

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A. GENERAL

1. SCOPE OF BID

- 1.1 SJVN Arun-3 Power Development Company (P) Ltd. (SAPDC), a company promoted by SJVN Ltd., as a single shareholder company in Nepal having its registered office at Lokanthali, Kathmandu, Nepal (here-in-after referred to as "Employer") has signed Project Development Agreement (hereinafter referred to as "PDA") with Government of Nepal to plan, promote, organize & execute Arun-3 Hydroelectric Project (900 MW) in Sankhwasabha District. of Nepal on Build, own, operate and transfer (BOOT) basis.
- 1.2 The successful bidder will be required to complete the 'Works' within the period stated in the Tender document/Bid Data, effective from the date of issue of the Letter of Acceptance of the Works.
- 1.3 Throughout these Bid Documents, the terms bid and tender and their derivatives (bidder/tenderer, bid/tender, bidding/ tendering etc.) are synonymous, day means calendar day. Singular also means plural, unless these are repugnant to the context.

2. SOURCE OF FUNDS

- 2.1 The Employer shall implement 4x225 MW Arun-3 Hydroelectric Project. The Project envisages a debt-equity ratio of 70: 30.

3. ELIGIBLE BIDDERS

- 3.1 This invitation to bid is open to (i) all the bidders from India Or (ii) Joint Venture/Consortium of Indian firms Or (iii) Joint Venture/Consortium of Indian and Nepalese firms (with Indian firm as lead partner) who meet the Qualification Criteria as per Clause-5.5 hereunder.
- 3.2 Bidders should not have been banned/ de-listed/ black listed/ debarred from business by Government of Nepal or any of its Government Department during last 03 (three) years on grounds of corrupt/fraudulent practices and/or due to non-performance and/or by Ministry of Power, Government of India/SJVN Ltd./SAPDC on any grounds.

4. ELIGIBLE MATERIALS, PLANT, SUPPLIES, EQUIPMENT AND SERVICES

- 4.1 The materials, Plant or Contractor's Equipment (Equipment), other supplies, and services to be provided under the contract, shall have their origin in eligible source countries, defined under the Government of Nepal Guidelines, and all expenditures made under the contract will be limited to such materials, Plant or Contractor's Equipment, other supplies, and services.

4.2 For purposes of Sub-clause 4.1 above, origin means the place where the materials, Plant, Equipment, and other supplies are mined, grown, produced, or manufactured, and from which the services are supplied.

5. QUALIFICATION OF THE BIDDER

5.1 Bidders shall, as part of their bid:

i) Submit a written power of attorney (POA) as per sub-clause 21.0 of ITB authorizing the signatory of the bid to commit the bidder;

i) In case of a General Power of Attorney, a true copy of the POA shall be duly notarized by Notary Public along with a declaration from the Company Secretary /Corporate Secretary endorsing the validity of the Power of Attorney.

ii) In case of a specific Power of Attorney (as per format included in forms & procedures), the original POA along with a copy of the resolution of Board of Directors for the specific appointment. In case of delegation by a General POA holder, the documents as sought under (i) above shall be submitted along with the original specific POA.

b) Submit/include in their bids the following information/documents:

(i) evidence of access to lines of credit and availability of other financial resources;

(ii) financial plan for the current year and two following years, including the effect of known commitments;

(iii) work commitments; and

(iv) availability of major Equipment.

c) Each bidder shall duly fill in the prescribed Data sheets/ qualification particulars along-with relevant experience certificates, Annual reports and other information evidencing proof of their meeting the qualification criteria stipulated herein.

d) Submit an offer which is clear, comprehensive, unambiguous and complete in all respects including all necessary technical, contractual and commercial information.

e) Submit a Declaration, **as per Proforma given in Section-4** confirming that the bid submitted by the bidder is strictly in conformity with the documents issued by SAPDC.

5.2 Bid submitted by a joint venture/ consortium of not more than **two** firms/companies, as partners shall comply with the following requirements:

a) The bid shall include all the information listed in Sub-Clause 5.1 above;

- b) The legally authorized signatory having notarized Power of Attorney of the partners of Joint Venture shall authorize lead partner to carry out bidding process. An undertaking that the bidding process carried out by the person authorized by the lead partner -as per clause 21.0 of ITB. In case of a successful bid, Integrity pact and Contract Agreement, shall be signed by all the partners so as to be legally binding on all partners;
 - c) One of the partners shall be authorized as the lead partner, who shall receive instructions and incur liabilities for and on behalf of the joint venture/consortium during pre-award and post-award (if awarded).
 - d) All discussions, bid clarifications and negotiations, if any, during pre-award stages shall be done with the lead partner along with other partners;
 - e) The payments against the Contract shall be made to the joint venture/ consortium;
 - f) All partners of the joint venture/consortium shall be liable jointly and severally for the Execution of the Contract in accordance with the contractual terms, and a statement to this effect shall be included in the bid and in the Agreement (in case of a successful bid).
- 5.3 Bids submitted by a Bidder with Manufacturer(s), shall comply with the following minimum requirements:
- (i) The Bidder and his Manufacturer(s) should submit separate undertakings (as per **Attachment-4(i)-Section-4** that the Bidder/Manufacturer(s) shall be responsible for Execution of that item of work for which they claim to have specific experience.
 - (ii) In order to ensure serious participation of the Manufacturer(s) for work proposed to be executed by the Manufacturer(s), a Joint Deed of Undertaking (as per **Attachment-4(ii)-Section-4** shall be required to be submitted by the Contractor and Manufacturer(s). Besides this, Manufacturer(s) shall submit an additional Performance Bank Guarantee equivalent to 3% of corresponding value of work sublet in addition to Performance Bank Guarantee for whole Contract submitted by the bidder on award of work.
- 5.4 Bids by Merged/Acquired/Subsidiary Company shall comply with the following minimum requirements:
- (i) Commitment by the parent/holding company to sign a separate agreement with Employer (as per format contained in **Attachment-5(i)-Section-4** confirming full support for the technical and financial requirements of the subsidiary company and commit to take up the work itself in case of non-performance by the subsidiary company in the event of award of the work to the subsidiary company.

- (ii) Parent/holding company shall submit an undertaking alongwith the bid (as per format contained in Attachment-5 (i) that in case Bidding Company(Subsidiary Company)gets qualified and awarded the work package on the strength of Parent/ holding Company, Parent/holding company shall furnish an additional performance bank guarantee of value equivalent to 3% three percent of the Contract Price or the portion of work (where the subsidiary company is Joint Venture Partner) as the case may be, in addition to normal Performance Bank Guarantee to be submitted by the Bidder to the Employer besides entering into a separate Agreement (as per **Attachment-5(ii) or 5(iii), as applicable**).

5.5 The minimum qualifying requirement for the eligible bidders is as under:

5.5.1 Technical Criteria

5.5.1.1 General Experience

Applicant (Prime contractor or as partner in a JV/Consortium or Sub-contractor approved by the respective employer) should have executed at least one Hydro-Mechanical work of contract value INR 76 Crore or more during the preceding twenty (20) years to be reckoned from the last day of month previous to the month in which applications are invited and which are in successful operation. In case of ongoing projects, the value of completed work shall be considered.

5.5.1.2 Technical Criteria (Specific Experience)

Applicant either itself or proposed Manufacturer(s), who have given authorization to the Applicant, should have experience in the design, procurement fabrication, shop assembly, painting, shop testing, supply, transportation, erection, testing and commissioning of the following Hydro-Mechanical works and pressure shaft steel liner works in a completed project during the preceding twenty (20) years to be reckoned from the last day of month previous to the month in which applications are invited.

a) Pressure shaft Steel liner

Fabrication/manufacturing, erection, testing and commissioning of one no. pressure shaft steel liner having a value of $D \times H$ not less than 1000 m² Where, D = Internal diameter expressed in m and H = maximum Design Head in (m).

Notes:

Experience of Supervision of erection, testing and commissioning of applicant shall also be considered at par with own erection, testing & commissioning of HM equipment and pressure shaft steel liner works.

The prime contractor or as partner in a JV or sub-contractor approved by the respective employer should have completed the works with specified criteria mentioned above in a single project or each one in different projects during the last twenty (20) years.

5.5.2 Financial Criteria:

i Submission of audited balance sheets or if not required by the law of Applicant's country, other financial statements acceptable to the Employer, for the last 5(five) years to demonstrate:

(a) the current soundness of the applicant's financial position and its prospective long term profitability. The net worth shall be positive for the last three financial years which shall be calculated based on subscribed and paid up Share Capital plus Share Premium plus Free Reserves plus Unallocated Balance/ Surplus amount of Profit and Loss Account, less (a) Expenses not written off, (b) Accumulated losses in Profit and Loss Account, if not reduced from reserves and surplus. The Revaluation reserves, Capital Reserves and amount of intangible assets like goodwill etc. will not be taken into account while calculating Net Worth, and

(b) capacity to have a cash flow amount (working capital) of at least INR 50 Crore or equivalent as evident from the last audited annual report or banking reference(s) as the case may be.

Notes:

- a. Banking reference(s) should contain in clear terms the amount that the Bank will be in a position to lend for this work to the applicant/member of the Joint Venture. In case the Net Working Capital (as seen from the Balance Sheet) is negative, only the Banking reference(s) will be considered, otherwise the aggregate of the Net Working Capital and submitted Banking reference(s) will be considered for working out the working capital.
- b. The Banking reference(s) should be from a "A" Class Nepalese Bank/Scheduled Bank of India and it should not be more than 3 months old as on the date of submission of applications.
- c. In case of JV- requirement of working capital/net cash flow is to be distributed between members as per their percentage participation and every member should satisfy the minimum requirement for his portion.

ii) **Average Annual Turnover:** Minimum Average Annual Turnover* (MAAT) for best three Financial years out of last five financial years of the bidder should be INR 76 Crore or equivalent, calculated as total certified payments received for contracts in progress or completed.

Note: The average annual turnover of JV will be based on percentage participation of each member.

General Notes for Financial Situation:

- i. The number of partners in case of Joint Venture including lead partner shall not be more than Two (2). The lead partner must be Indian having minimum 51% participation in the JV/JVA and other partner shall have

minimum 20% participation. Partner having less than 20% participation in the JV will be termed as non-substantial partner and will not be considered for evaluation of financial criteria which means that their financial soundness shall not be considered for evaluation of JV. In that case, the left out requirement shall be met out by the lead partner of JV in addition to his own requirement specified in the QR and over all JV should meet the 100% requirement.

- ii. Sub-contractors turnover shall not be considered
- iii. Turnover of the applicant/partner from the related business shall only be taken into consideration for purpose of evaluation. In case Turnover from related business is not shown separately in the financial statements, a certificate from Chartered Accountant certifying Turnover from related business shall be submitted.
- iv. Annual Report along with audited Balance Sheets, Profit & Loss Accounts, the schedules and other Financial Statements of the immediately preceding 5(five) years of the Applicant should be furnished by the Applicant for checking and evaluating their Financial Capacity vis-à-vis the requirement stipulated hereinabove.

In case, if the Bidder has not submitted the above Annual Report along with the Bid, then a certificate from CEO/CFO of the Bidder shall be submitted along with Bid mentioning that the requirement of Annual Report as per governing law of country is not mandatory. In such cases duly notarized copies of Audited Printed Annual Financial Statement (Balance Sheet, Profit & Loss Statement, cash flow statement, Auditor's Report thereon including all relevant schedules/ annexure etc.) for the immediately preceding 5(five) years be submitted by the Bidder along with the Bid.

- v. In case where Audited financial results for the immediately preceding year are not available, then a statement of account as on the closing date of the immediately preceding financial year depicting the Turnover, Net Worth duly certified by their Statutory Auditor/ Certified Public Accountant carrying out the Statutory Audit shall be enclosed with the bid along with copy of appointment letter of the Statutory Auditor.
- vi. Wherever, the Annual Report/ duly notarized copies of Audited Printed Annual Financial Statement are in language other than English, then copy duly translated & printed in English language and certified by approved/ recognized English translator shall be submitted with the Bid.
- vii. For conversion from INR to NPR and vice versa, a factor of 1.6 will be considered.

5.5.3 Bid Capacity

The available Bid capacity of the Bidder at the time of submission of price bid, calculated as under should not be less than INR 151 Crore.

Available Bid capacity = $2.0 \times A \times N - B$

Where;

A= Maximum value of Works executed in any one year during last 3 years

N = Number of years prescribed for completion of the subject contract package

B = Value of existing commitments (as on bid submission date) and on-going works to be completed in next "N" years.

The Bidder shall submit documentary evidence together with a certificate from its statutory auditors in support of establishing 'A' and 'B' above, along with their Bid.

6.0 Nature of Bidders

The Bidder should either be a single entity or a JV/ consortium formed for participating in the tendering for this Project. Subject to sub-clause 6.2, the bidder (single entity) shall be allowed to associate Manufacturer(s) for certain components in which he does not have the requisite experience. *Each Bidder shall submit only one Bid, either individually or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid (other than as a Manufacturer who can participate in more than one bid but only in that capacity) shall cause all the proposals with the Bidder's participation to be disqualified.*

For evaluation of specific experience of various Bidders, following criteria shall be considered: -

- i. The evaluation of Bidder's specific experience for a work executed on JV basis shall be based on his role and scope of work in such joint ventures. To establish his role and scope of work in such Joint Venture contracts, the Bidders shall adduce documentary evidence to the extent of his claimed experience. In case the quantum of work as per experience certificate does not match with the scope of work as defined in the JV/consortium agreement, then the experience credentials shall be considered as per the experience certificate issued by the employer /client.
- ii. In case scope of work of individual partners is not clearly defined in the JV/consortium agreement then credential of Bidders being partner in a JV/consortium shall be decided in the following manner: -
 - a. Where specific experience certificate in respect of individual JV partners is available, the same shall be considered to the extent of work executed by such JV partner.

- b. Where specific experience certificate is not available, or experience certificate is issued in the name of JV/consortium, the evaluation shall be done in the following manner: -
- i. In case the participation / profit sharing percentage of Bidders as per JV agreement is at least 35%, full credit of the work executed by the JV/consortium shall be given to such Bidders.
 - ii. In case the participation / profit sharing percentage of Bidders in JV agreement is less than 35%, no credit of work executed under such JV shall be given to such Bidders.
 - iii. Notwithstanding (i) and (ii) above, in case of availability of specific experience certificate, (a) above shall apply.

In case both participation share and profit sharing ratio are available in the JV Agreement, participation share shall prevail.

- iii. For the portion of work executed through a Manufacturer(s), full experience for that portion of work can be claimed by the contractor as well as Manufacturer(s) for fulfilling criteria for evaluation of Bidder's specific experience.

6.1 Joint Venture/Consortium Bidders:

Joint Venture or Consortium shall comply with the following minimum qualifying requirements:

- The number of partners in the Joint Venture/ Consortium including the Lead Partner shall not exceed two (2).
- The Lead Partner to fully meet the following:
 - General Experience criteria specified in para 5.5.1.1.
 - Average annual turnover not less than 51% of criteria specified under Financial Criteria in para 5.5.2 (ii)
 - Working Capital Criteria shall be based on the % participation as specified under Financial Criteria in para 5.5.2(i)(b)
 - Specific experience criteria specified in para 5.5.1.2
- The other partner/member to individually meet the following:
 - Average annual turnover not less than 20% of criteria specified under Financial Criteria in para 5.5.2 (ii)
 - Working Capital Criteria shall be based on the % participation as specified under Financial Criteria in para 5.5.2 (i)(b)
 - One or more of the criteria of Specific Experience specified in para 5.5.1.2.

- The Specific Experience of each component structure to be met individually by the Lead partner and / or other partner as the case may be.
- All the partners of the Joint Venture/Consortium to individually fulfill the Net Worth criteria specified under Financial Capacity in para 5.5.2(i).
- The Joint Venture/Consortium shall collectively satisfy, as a whole the Financial as well as Technical Requirements.
- The Bid Capacity requirement shall be satisfied by individual partner of Joint Venture/Consortium in proportion to their participation share of works in Joint Venture
- The parties shall be required to form the Joint Venture/Consortium before applying for the tender which shall be evinced by submitting a copy of the Joint Venture/Consortium agreement already entered into for the purpose. The Joint Venture/Consortium agreement should contain the roles and responsibilities of each constituent, the proposed participation share of each partner along with the items of work to be executed by each partner. It shall also be brought out in the Joint Venture/Consortium agreement that in case the Contract is awarded to the Joint Venture/Consortium, each partner of the Joint Venture/Consortium shall be responsible for execution of that item of work for which he claims to have specific experience.
- Lead partner of the Joint Venture/Consortium should be an Indian firm with at least 51%share.

6.2 Bidders with Manufacturer(s):

In case the Bidder does not have all requisite specific experience and also does not wish to enter into a Joint Venture, he can associate manufacturer / Manufacturer(s) for specified activities as brought out below in para (iii) in which he does not have the relevant experience. The criteria to be met by such Bidders shall be as follows:

- (i) The Bidder himself to fully meet the following:
 - General Experience criteria specified in para 5.5.1.1.
 - All criteria mentioned under Financial capacity in para 5.5.2
 - Specific experience criteria specified in para 5.5.1.2
 - Bid Capacity as mentioned in Para 5.5.3
- (ii) The number of Manufacturer(s) not to exceed two (2) for meeting the specific experience criteria.
- (iii) The Bidders can propose the subcontractor(s)/Manufacturer(s) for 'Specific Experience', under para 5.5.1.2.

- (iv) The proposed Manufacturer(s) shall individually meet at least one or more of the Specified criteria of Specific Experience for components listed in para 5.5.1.2
- (v) The Bidders and his proposed Manufacturer(s) should collectively satisfy, as a whole all the specified experience requirements.
- (vi) The Bidders and his Manufacturer(s) should submit separate undertakings that the Bidders/ Manufacturer(s) shall be responsible for execution of that item of work for which they claim to have specific experience.
- (vii) Manufacturer shall submit Performance Bank Guarantee equivalent to 3% of value of work sublet in addition to the performance Bank Guarantee for whole contract submitted by the bidders on award of work.

6.3 Bids by Merged/ Acquired/ Subsidiary Companies/Single Entity:

In case of a Bidder's Company/Entity, formed after merger and/ or acquisition of other companies, past experience and other antecedents of the merged/acquired companies will be considered for qualification of such Bidders Company/Entity provided such Bidders Company/Entity continues to own the requisite assets and resources of the merged/ acquired companies needed for Construction and successful implementation of the work package put to tender.

Similarly, if the Bidders Company/Entity is a subsidiary company and applies for qualification on the unconditional technical and financial strength of the Parent/ Holding company, the same shall be considered provided the Parent/ Holding company commits to sign a separate agreement with the Employer (in the format included in the Forms and Procedures of these Bid Documents) evincing full support for the technical and financial requirements of the subsidiary company and commit to take up the work itself in case of non-performance by the subsidiary company in the event of award of the work to the subsidiary company. An undertaking by the Parent/Holding company to this effect shall be submitted alongwith the bid (in the Format provided in the Bid Document).

For the purpose stated herein above in this clause, 'Parent Company' shall mean the 'Holding Company' owning majority (more than 50%) shares of such Bidders (Subsidiary) Company. Similarly, by extensions of this interpretation, if "A" is owned by a 'Holding Company' "B" which in turn is owned by another Holding Company "C" then "C" is construed as the 'Parent Company' of "A" as well as and so on. An apex 'Parent Company' may own number of independent Subsidiary / Group Companies and if any of these Subsidiary/Group Company commits assured support and unhindered

access to its assets and resources to another Subsidiary/Group Company (Bidders in this case) under the same apex 'Parent Company' then experience and other credentials of such Subsidiary/Group Company shall also be considered for qualification of the Bidders Subsidiary Company provided such commitment is evidenced /authorized and guaranteed by the apex 'Parent Company'.

In case Bidding Company (subsidiary company) gets qualified and awarded the work package, the Parent company/Holding Company will be required to furnish an additional performance bank guarantee of value equivalent to (3%) five percent of the Contract Price or portion of work (where subsidiary Company is Joint Venture Partner) as the case may be, in addition to normal Performance Security to be submitted by the Bidder to the Employer besides entering into a separate Agreement in the requisite Format provided in the Bid Document. The experience of subsidiary companies of the Parent/ Holding Company will be considered experience of the Parent/ Holding Company.

However, for fulfillment of financial criteria, financial evaluation vis-s-vis the requirement as stated above shall be done on the basis of consolidated printed annual report for the immediately preceding 5 (five) years of the Parent/ Apex Parent Company submitted by the bidder along with the bid.

7. COST OF BIDDING

- 7.1 The bidder shall bear all costs associated with the preparation and submission of its bid, and the Employer/SAPDC will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

8. SITE VISIT

- 8.1 The bidders in their own interest, should inspect and examine the site and its surroundings and satisfy themselves, before submitting their bid, in respect of the site conditions including but not restricted to the following which may influence or affect the Works or cost thereof under the Contract:
- a) Site conditions including access to the Site, existing and required roads and other means of transport/ communication for use by them in connection with the Works;
 - b) Requirement and availability of land and other facilities, for their enabling works, colonies, stores and workshops etc. Such land shall be arranged by the Contractor at his own cost,
 - c) Source and extent of availability of suitable materials including water, etc. and labour (skilled and un-skilled), required for Works and laws and regulations governing their use and employment;
 - d) The type of Equipment and facilities needed, preliminary to, for and in the performance of the Works; and

- e) All other information pertaining to and needed for the Works including information as to the risks, contingencies and other circumstances which may influence or affect the work or the cost thereof under this Contract.
 - f) Environmental aspects.
 - g) All applicable taxes, duties, royalty, cess, octroi etc.
- 8.2 The bidders should note that information, if any, in regard to the site and local conditions, in these Bid Documents is indicative only and has been given merely to assist the bidders and is not exhaustive.
- 8.3 The bidders should note and keep in mind that the Employer/SAPDC shall bear no responsibility for former's lack of acquaintance of the Site and other conditions or any information relating thereto. The consequences of the lack of any knowledge, as aforesaid, on the part of the bidders shall be at their risk and cost and no charges or claims whatsoever consequent upon the lack of any information, knowledge or understanding shall be entertained or payable by the Employer.
- 8.4 The bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the bidder, its personnel, and agents, will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 8.5 The bidders should note and bear in mind that the costs of visiting the Site shall be at the bidder's own expenses.

B. BID DOCUMENTS

9. CONTENT OF BID DOCUMENTS

9.1 The Bid Documents are those stated below, and should be read in conjunction with any Addenda/Corrigenda issued in accordance with Clause 11:

Volume-I	Section-1	Press Notice, NIT and Information for Bidders (IFB)
Volume-I	Section-2	Instructions to Bidders (ITB), Bid Data & Qualification forms
Volume-I	Section-3 Section -4	General Conditions and Special Terms & conditions Contract Forms <ul style="list-style-type: none"> • Letter of Tender along with Attachments • Form of Notification of Award • Form of Contract Agreement along with Appendix • Performance Security Form • Bank Guarantee Form for Advance Payment

		<ul style="list-style-type: none"> • Form of Completion Certificate • Form of Operational Acceptance Certificate • Change Order Procedure and Forms • Integrity Pact alongwith Annex-A & Undertaking
Volume-II	-	Bill of Quantities
Volume-III	-	Technical Specifications
Volume-IV	-	Tender Drawings
Volume-I	Section-5	Data Sheets

10. CLARIFICATION

10.1 A prospective Bidder requiring any clarification may notify SAPDC through e-mail to www.pnc.sapdc@gmail.com. The SAPDC will respond to such requests through the Notification/Corrigendum/Addenda on the web portals: www.sapdc.com.np, www.sjvn.nic.in & www.eprocure.gov.in. The bidders can seek clarifications through e-mail, which shall be responded to and clarified as per clause 11.0 of ITB. The Employer/SAPDC shall not be obliged to respond to any request for clarification received later than the above period. Further, the mere request for clarification from the Bidders shall not be a ground for seeking extension in the deadline for submission of bids.

11. NOTIFICATION/AMENDMENT TO BID DOCUMENTS

11.1 At any time prior to the deadline for submission of Bids, SAPDC may, for any reason, whether at its own initiative, or in response to a clarification requested by a prospective Bidder, amend the Bid Documents by issuing Addenda.

11.2 Any Addendum/corrigendum/Amendment thus issued shall be part of the Bid Documents pursuant to Sub-clause 9.1 and shall be communicated/notified only through the web portals www.sapdc.com.np, www.sjvn.nic.in & www.eprocure.gov.in. The amendments to the Bid Documents will be binding on the bidders and the notification of the amendment issued through web portal, shall be deemed to be construed that such amendment(s) to the Bid Documents have been taken into account by the Bidder in its bid.

11.3 To give prospective Bidders reasonable time in which to take an Addendum corrigendum/Amendment into account in preparing their Bids, SAPDC shall extend as necessary the deadline for submission of Bids, in accordance with

Clause 22 and notify on web portals mentioned at Clause 11.0, all prospective bidders may see the extended deadline for submission of bids.

C. PREPARATION OF BIDS

12. LANGUAGE OF BID

12.1 The Bid, all correspondence and documents related to the Bid exchanged by the bidder and SAPDC shall be written in English. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied with a certificate of the authorized translator certifying therein an accurate translation of the relevant passages in the above stated language, in which case, for the purposes of interpretation of the Bid, the translation shall prevail.

13. DOCUMENTS COMPRISING THE BID

13.1 The Bid submitted by the Bidder shall comprise the following documents: - Each Bidder shall submit with its bid the following attachments (upload the soft/scanned copy on e-portal <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp> and submit in Hard copy form also in Envelope/Cover Part-I:

- a) Letter of Tender duly completed and signed by the Bidder, together with all Attachments identified in Sub-Clause 13.2 below.
- b) Data related to Qualifying requirements (including Qualification Forms, data for establishing bid capacity, net worth, working capital and Data Sheets).

13.2 Each Bidder shall submit with its bid the following attachments (upload the soft/scanned copy on e-portal <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp> and in Hard copy form also in Envelope/Cover Part-I:

- (a) Attachment-1: Bid Security/EMD
A bid security furnished in accordance with Clause 18.
- (b) Attachment-2: Power of Attorney
A power of attorney, as per Sub-clause 5.1 (a), indicating that the person(s) signing the Bid has the authority to sign the Bid and that the Bid is binding upon the Bidder during the full period of its validity in accordance with Clause 17.
- (c) Attachment-3: Bidder's Eligibility and Qualifications
Bids submitted by a joint venture or a consortium of firms/companies as partners shall comply with the following requirements: -
 - (i) The bid has to be signed as per sub-clause 5.2 (b), so as to be legally binding on all partners
 - (ii) Authorization to carry out the bidding as per sub clause 5.2(b).
 - (iii) The payments against the Contract shall be made to the joint venture/consortium.

- (iv) All partners of the joint venture shall be liable jointly and severally for the Construction of the contract in accordance with the contractual terms, and a statement to this effect shall be included in the authorization at (ii) above, as well as in the bid and in the Agreement (in case of a successful bid).
 - (v) A declaration in respect of the submitted bid conforming to the requirement of Sub-clause 5.1 (e).
- (d) Attachment 4: Bids with Manufacturer(s):

Bids submitted by a bidder with Manufacturer(s) shall comply with the following requirements:

- (i) Undertakings by the Bidder and his Manufacturer(s) that the Bidder / Manufacturer(s) shall be responsible for execution of that item of work for which they claim to have specific experience.
 - (ii) A Joint Deed of Undertaking by the Bidder and his Manufacturer(s).
- (e) Attachment 5: Bids by a Merged/Acquired/subsidiary company:

Bids submitted by a Merged/Acquired/subsidiary company shall comply with the following requirements:

Undertaking by the Parent/ Holding Company evincing full technical and financial support to the subsidiary and commitment by the parent / Holding company to take up the work itself in case of non-performance of the subsidiary company and to provide additional performance guarantee and also to enter into separate agreement with the Employer to that effect.

- (f) Attachment-6: - Undertaking regarding blacklisting.

Undertaking regarding blacklisting in accordance with Sub-Clause-3.2 of ITB.

- (g) Attachment-7: Joint Venture/Consortium Agreement (attested by Notary Public) and signed between Lead Partner and the other Partner(s) of JV/C as per format included in Bid Document.
- (h) Attachment-8: Deviations

In order to facilitate evaluation of bids, deviations, if any except critical provisions from the requirements of the General conditions, Bid Data, Commercial conditions, Technical Specifications and Drawings along with withdrawal cost for the same shall be listed in Attachment -8 provided for the same in its bid. The deviations listed elsewhere in the bid shall not be given any cognizance and shall be treated as deemed to be withdrawn. The Bidder has to provide the additional price, for withdrawal of the deviations indicated therein.

In particular, Bids with deviations from, objections to or reservations on provision such as those concerning Bid Security/EMD, bid validity, Defects Liability, Indemnity and on provisions mentioned below, if any, will be treated as non-responsive.

Bids containing deviations from critical provisions relating to GC Clause 11.0 (Contract Price), 12.0 (Terms of Payment), 13.3 (Performance Security), 14 (Taxes and Duties), 27.0 (Defects Liability), 29.0 (Patent Indemnity), 30 (Limitation of Liability), 40 (Extension of Time for Completion), 45 & 46 (Claims, Disputes and Arbitration) and Appendix-2 (Price Adjustment) will be considered as non-responsive. The above list is illustrative only and not exhaustive.

However, the bidders wishing to propose deviations to any of the provisions other than those mentioned above, must provide in the Attachment-8(i) without cost of withdrawal and in Attachment-8 (ii) of the bid with cost of withdrawal of each of such deviations. If such deviations are not priced, cost of withdrawal of such deviations shall be treated as 'NIL'. The evaluated cost of the bid shall include the cost of withdrawal of the deviations from the above provisions to make the bid fully compliant with these provisions.

The deviations listed without any cost and not accepted by Employer shall have to be withdrawn by the bidder without any financial implications to Employer before opening of price bid. In case of non-withdrawal of such deviations, the bid shall be rejected being non responsive.

At the time of Award of Contract, if so desired by the Employer, the bidder shall withdraw these deviations listed in Attachment- 8(i) and Attachment-8 (ii) at the cost of withdrawal stated by him in the bid. In case the bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid, his bid will be rejected.

However, the attention of the bidders is drawn to the provisions of examination of bids regarding the rejection of bids that are not substantially responsive to the requirements of the bidding documents.

- (i) # (Any other Attachment, if required, shall be attached with letter of Tender)

13.3 Price bid (Part-II) to be duly filled/completed by the Bidder (i.e. only on e-tender portal).

14. LETTER OF TENDER AND PRICE SCHEDULE

- 14.1 The Bidder shall complete the Letter of Tender and the appropriate Price Schedule furnished in the Bid Documents as indicated therein and in the Sub-section "Letter of Tender" and "Price Schedule" of the Bid Documents, following the requirements of Clauses 15 and 16.

15 PRICE SCHEDULE

- 15.1 Unless stated otherwise in the Bid Documents, the Contract shall be for the whole Works as described in Scope of Bid, based on the unit rates and prices in the Price Schedule submitted by the bidder.
- 15.2 The bidder shall fill in rates and prices for all items of the Works described in the Price Schedule. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Price Schedule.
- 15.3 There is no provision in the tender for offering of rebate/discount as the bid evaluation shall be carried out on the basis of e-tender/e-Reverse Auction (e-RA) process under clause 30.4.
- 15.4 All duties, taxes, and other levies payable by the Contractor under the Contract, shall subject to clause 15.5 herein be included in the rates and prices and the total Bid Price submitted by the bidder.
- 15.5 Unless otherwise provided in the Bid Data and General Conditions, the rates and prices are subject to adjustment during the performance of the contract in accordance with the relevant provisions of contract.
- 15.6 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bid Documents. If a Bidder wishes to make a deviation, such deviation along with withdrawal cost for the same shall be listed in attachment provided for the same in its bid. The deviations listed elsewhere in the bid shall not be given any cognizance and shall be treated as deemed to be withdrawn.
- 15.7 Price bid Under Envelope-II shall be submitted only through SJVN e- portal i.e <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp> (by filling price part in electronic form/template & uploading soft/scanned copy of Dully filled, Signed & stamped of bid form & Schedules under Envelope-II) (Not in Hard copy), any other mode of submission of price bid part shall not be accepted.

16.0 CURRENCIES OF BID

- 16.1 The unit rates and prices can be quoted by the bidders separately in the following currencies:
- a) In Nepalese Rupees for those inputs to the Works which the bidder expects to supply from within the Employer's country, and
 - ii) In Indian Rupees for those inputs to the Works which the bidder expects to supply from outside the Employer's country. (referred to as "the foreign currency requirements").

17. BID VALIDITY

- 17.1 Bids shall remain valid for the period stipulated in the Bid Data from the date of opening of Technical Bid specified in Clause 25.
- 17.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer/SAPDC may request the bidders to extend the period of bid validity for a specified additional period. The request and the responses thereto shall be made in writing or by e-mail/fax. A bidder may refuse the request without forfeiting its bid security. A bidder agreeing to the request will not be required or permitted to modify its bid, but will be required to extend the validity of its bid security for the period of the extension, and in compliance with Clause 18 in all respects.

18 BID SECURITY/EMD

- 18.1 The bidder shall furnish, as part of its bid, a bid security for the amount stipulated in the Bid Data.
- 18.2
- i) The bid security /EMD amounting to INR 1,60,00,000/- (Indian Rupees One Crore Sixty Lakh only)
- OR
- NPR 2,56,00,000/- (Nepalese Rupees Two Crore Fifty Six lakh only) shall be required to be submitted with the bid in either of the form:

Bank Draft/Manager Cheque/FDR (be issued by "A" class bank of Nepal only) in the name of "**SAPDC-NPR CONSTRUCTION ACCOUNT**". However, FDR should be duly pledged in favor SJVN Arun-3 Power Development Company Pvt. Ltd.

OR

Bank Guarantee in favor of SJVN Arun-3 Power Development Company Pvt. Ltd. The said Bank Guarantee should be submitted along with the bid in accordance with clause 21.1 of ITB.

Bank Guarantee from any "A" class Bank in Nepal for the amounts expressed in Nepalese Rupees (NPR). The Bank Guarantees in INR shall be acceptable only if these are issued by a Scheduled Bank of India duly counter guaranteed by any A class Bank in Nepal.

The format of the bank guarantee shall be in accordance with the form of bid security included in Section 4. Bid securities shall remain valid for a period of 90 days, beyond the original validity period of the bid or beyond any period of extension subsequently requested under sub-clause 17.2.

OR

Alternatively, payment against Bid Security/EMD may also be made directly in the following bank account of SJVN Arun-3 Power Development Company Pvt. Ltd. However, proof of same shall be submitted by the Firm/agency with the Proposal in Part-I (Envelope-I):

NPR Account Details:

Name of Bank: Everest Bank Limited, Nepal

Name of beneficiary: "SAPDC- NPR CONSTRUCTION ACCOUNT"

Acc. No. 00800105200477

Swift Code: EVBLNPKA

*Bidder shall be responsible to ensure the receipt of net amount (excluding bank transfer charges) in the account before last date of submission of bid. Further, the bidder shall submit the copy of receipt in Envelope/Cover (**Part -I**) of the bid.

- 18.3 Any Bid not accompanied by an acceptable Bid Security and Letter of Tender together with its attachments shall be rejected by the Employer as non-responsive. The bid security of a joint venture must be in the name of the individual partner of Joint Venture in proportion of its participation in joint venture submitting the bid.
- 18.4 The Bid Securities of all the unsuccessful bidders will be returned as below:
- a) The Bid Security of those Bidders who do not qualify in Techno-Commercial evaluation, shall be returned immediately after opening the Price Bids of Techno-Commercially responsive bidders.
 - b) The Bid Security of the Bidders other than L-1 Bidder, shall be returned within 30 (thirty) days from the date of issue of 'Letter of Acceptance' to the successful Bidder.

No interest shall be payable on the amount of security.

- 18.5 The Bid Security of the successful Bidder will be returned when the Bidder has signed the Agreement and furnished the required performance security.
- 18.6 The Bid Security shall be forfeited if:
- a) the Bidder withdraws its Bid or varies any terms & conditions in regard thereto during period of bid validity or;
 - b) if the Bidder adopts corrupt or collusive or coercive or fraudulent practices covered under ITB Clause-37 or defaults committed under Integrity pact clause-39 of ITB.
 - c) in the case of a successful Bidder, if he fails within the specified time limit to;
 - (i) sign the Agreement, or
 - (ii) furnish the required performance security.

19. CLARIFICATION ON BID DOCUMENT

- 19.1 The bidders may seek the Clarifications on Bid Document (if required) through e-mail, which shall be responded to and clarified as per clause 11.0.
- 19.2 Any modifications of the Bid Documents listed in sub-clause 9.1, which may become necessary as a result of the clarifications issued, shall be made by

the Employer/SAPDC exclusively through the issue of an Addendum/Corrigendum/Addenda pursuant to clause 11.0.

19.3 The Pre bid meeting (if required) may be held, for which the separate notification shall be issued on websites mentioned at Clause No.10.0

20. SIGNING OF BID

20.1 The Bidder shall prepare the documents comprising the Bid as described in Clause 13 of these Instructions to Bidders.

20.2 The Bid shall be signed (Digitally or Physically) by a person duly authorized to sign on behalf of the Bidder, pursuant to Sub-clause 5.1(a) or 5.2 (b), as the case may be.

20.3 The Bid shall contain no overwriting, alterations, omissions, or additions, unless such corrections are initialed by the person or persons signing the Bid. Corrections if any shall only be made by scoring out the cancelled portion, writing the correction, initialing and dating it by the person or persons signing the Bid.

20.4 The Bids shall be signed as under:

- a) If the Bid is submitted by an individual, it shall be signed by the proprietor above his full name and name of the firm with its current business address.
- b) If the Bid is submitted by a proprietary firm, it shall be signed by the proprietor.
- c) If the Bid is submitted by a firm in partnership, it shall be signed by a partner holding the power of attorney. A certified copy of the partnership deed duly registered and current business address of all the partners of the firm shall also accompany the Bid.
- d) If the Bid is submitted by a limited company, it shall be signed by a duly authorized person holding the power of attorney together with a Board resolution in this regard for signing the Bid, in which case a certified copy of the power of attorney supported with resolution of BOD shall accompany the Bid. Such limited company may be required to furnish satisfactory evidence of its existence before the contract is awarded.
- e) All witnesses and sureties shall be persons of status and their full names, occupations and addresses shall be stated below their signatures.

D. PREPARATION & SUBMISSION OF BIDS

(A Single Stage Two Envelope Bidding Procedure will be adopted)

21. Documents comprising the bid and manner of Submission thereof:

The bid shall consist of two parts **(Part-I & II)** as under:

21.1 Part –I (Online as well as in a separate sealed Envelope/Cover-I)

- i) Cost of Tender Document and Bid Security/ EMD (in original)
- ii) Comprising Techno-commercial bid (**i.e. excluding price bid part-II**) (duly signed & stamped) shall be submitted in this part-I of the bid in soft/scanned copy of the following be uploaded on SJVN e-portal page <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp> and also the Hard copy of same will be submitted :
 - a) Bidding Forms
 - b) Constitution and legal status of the Bidder, place of registration and principal place of business.
 - c) Photo copy of VAT/PAN/GST Registration.
 - d) Original Power of Attorney in favour of authorized signatory
 - e) Original Joint Venture agreement in case of JV; and
 - f) Bid Data Sheets
 - g) Integrity Pact alongwith Annex-A & Undertaking
 - h) Other document(s) required to be submitted as per Clause 13 of ITB/ relevant to the terms & conditions of NIT/ Tender Document/Addenda/Corrigenda/Amendment/Notification.

The bidder shall sign and stamp each page of the documents forming part of the bid, on the left hand cover (bottom side).

***No price sensitive information is to be submitted in Part-I of bid.**

21.2 Part-II (Price bid):

Price Bid - Bill of Quantities (BOQ) shall be submitted only through SJVN e-portal i.e <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp> (by filling in electronic form/template & uploading soft/scanned copy of Dully filled, Signed & stamped of bid form & Schedules (Not to be submitted in Hard copy). Any other mode of submission of price bid (part_II) shall not be accepted.

21.3 In the "Techno-Commercial" part-I of the bid, the bidder shall not give any indication about the bid price in any manner whatsoever. Non-compliance of this provision shall result in the rejection of bid.

21.4 The Part II of the bid shall be strictly in accordance with the e- forms provided to fill the Price(s) in the Bill of Quantities(BOQ). Non-compliance of this provision shall result in the rejection of bid.

21.5 The bidder shall not take any deviation from the bid conditions.

21.6 Techno - Commercial bid (Part –I) only, as per clause 21.1 shall be packed and submitted in the following manner:

- i. Part –I, of the bid shall be kept in separate envelope/cover duly super scribed with the "The Part-I - Bid security/EMD & cost of Tender Document and Techno Commercial Bid in Original duly super scribed with the "The Part-I – "Techno Commercial Bid" in another separate envelope/cover be sealed.
- ii. The two separate envelopes/covers containing complete Part-I of the bid shall then be kept in a single cover and be sealed. The outer most cover would bear the following identifications/:

On upper left hand corner.

- ◆ Bid for (Name of Work) & Tender No.
- ◆ Do not open before
- ◆ To be opened by tender committee only.

In the center of the cover.

- ◆ Name of the person/ officer and the office address to whom bid is addressed.

On the bottom left hand corner:

- ◆ Name and address of the bidder.

21.7 Beside submitted through online portal and except the Part- II- (Price bid), the bidders shall submit their bid (i.e.Part-I) either by post or physically in the office of Chief Engineer (P&C), SAPDC, Satluj Bhawan, Tumlingtar, Distt. Sankhuwasabha, Nepal, Ph. +977-29-575154, 9852099789 OR alternatively in office of Company Secretary, SAPDC- SJVN Arun- 3 Power Development Company (SAPDC) at 3rd floor, Citizen Investment Trust (CIT) Building, New Baneshwor, Kathmandu, Nepal, wherein the bids shall be received only till two days prior to the last date for submission of bids.

However, SAPDC shall not be responsible for any delay in receipt due to any reason whatsoever and/ or for loss of the bid in postal transit.

22.0 Dead line for Submission of Bids

16.1 22.1 The bid (in soft part by uploading on SJVN e-Portal <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp>) and hard copy part shall be received by SAPDC not later than the time & date at the address specified in the NIT. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bid will be received up to the specified time on the next working day.

22.3 SAPDC also reserves the right to extend the deadline for submission of bids by issuing an amendment/corrigendum in accordance with clause 11.0 hereof, in which case all rights and obligations of the SAPDC and the bidders

previously subject to the original deadline will then be subject to the new deadline.

Further the Employer/SAPDC also reserves the right to extend bid submission timeline or recall if e-procurement server (i.e SJVN e-portal) is down (i.e inaccessible/inoperative) the tender for a prolonged period of time within the last 24 hours of the bid submission due date.

23.0 Late/Delayed Bids

The bidder shall not be permitted to submit the Soft Copy Part of the bid after the deadline for submission prescribed by the Employer/SAPDC. Any bid received from a bidder in Envelope /Cover (i.e. Part-I) physically by the SAPDC after the deadline prescribed by the SAPDC in accordance with clause -22.0 hereof will remain unopened . SAPDC shall not be responsible for any postal delay in respect of submission of the bid, however the e-Procurement system would not allow any late submission of bids through the portal <https://etender.sjvn.co.in/SRMLLogin/SRMLLogin.jsp> after due date & time as specified.

In case Hard copy part of the bid i.e Techno- commercial bid under 1st Envelope-I is not received till the deadline for submission of the same as prescribed by the Employer/SAPDC, but the bidder has uploaded the soft/scanned copy of the technical part of bid (i.e. the bid under first envelope). The uploaded technical bid on the portal shall be opened and such bid may be rejected during preliminary examination.

The bid is received by the Employer/SAPDC after the deadline for submission as prescribed, the bid will be considered as late bid. In such a case, the bids will be rejected.

24.0 Modification and Withdrawal of Bids

24.1 As per provisions in the tender document /e-portal only, the bidder may modify or withdraw the bid after submission, provided that modification is done on the e-portal as well as notice is received by the Employer/SAPDC prior to the deadline prescribed for bid submission.

24.2 The Bidder"s modifications shall be done and submitted as follows:

- (i) Modified Electronic form of the bid as per the provision of portal therein.
- (ii) Soft copy of the entire bid if any modification is there.

24.3 No bid may be withdrawn in the interval between the bid submission deadline and the expiration of the bid validity period specified in ITB Clause 17. Withdrawal of a bid during this interval may result in the Bidder"s forfeiture of its bid security, pursuant to ITB Sub-Clause 18.6.

24.4 The bidder's modification or notice of withdrawal shall be prepared, sealed, marked and delivered in accordance with the clause -20.0 & 21.0, with the inner envelopes additionally marked "Modification" or "Withdrawal" as appropriate.

24.5 No bid may be modified subsequent to the deadline for submission of bids.

E. BID OPENING AND EVALUATION

25. BID OPENING

25.1 In case of non-submission of bid by the bidder in the portal (soft copy part of the bid) within the stipulated deadline, then even if the bidder has submitted the specific documents in hard copy part in original within the stipulated deadline pursuant to ITB 22.1, the said bid shall be considered as incomplete bid, which will be summarily rejected.

Similarly, in case of non-submission of Hard copy part of the bid, but the bidder has uploaded the soft copy part of the bid on e-portal as mentioned in tender document, the bid will be considered as incomplete bid. In such a case, the soft copy part of the first envelope bid uploaded on the portal shall be opened. Such bids will be rejected during preliminary examination.

The Employer/SAPDC will open the Techno Commercial Bid (Part-I) online & offline in the presence of Bidders' designated representatives who may choose to attend, at the time, date, and location stipulated in the Bid Data. The Bidder's representative who are present shall sign a register evidencing their attendance. No Bid shall be rejected at the Bid opening except for the late Bids pursuant to clause 23 hereof.

The date of opening of Price Bid (Part-II) on online mode only shall be intimated/Notified to all the techno-commercially responsive bidders. Price Bids shall be opened on due time, date and place as specified by the Employer. Price Bids of the Bidders whose Bids not found Techno-commercially responsive shall not be considered for opening and shall not be considered at all any further.

25.2 At the time of opening, all important information and any such other details as the Employer may consider appropriate, will be announced by the Employer. This shall include but may not be limited to the Bidders' names, the Bid Prices including deviations and the presence (or absence) of bid security.

26. PROCESS TO BE CONFIDENTIAL

26.1 Information relating to the examination, clarification, evaluation and comparison of bids, and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful bidder has been announced. Any effort by a bidder to influence the Employer's processing of Bids or award decisions may result in the rejection of the bidder's bid.

27. CLARIFICATION FROM THE BIDDER

- 27.1 To assist in the examination, evaluation, and comparison of bids, Employer may, at its discretion, ask any bidder for clarification of its Bid, including breakdowns of unit rates as per the format given in Data Sheet – 5, Vol-I of tender document .The request for clarification and the response shall be through e-mail but no change in the price or substance of the bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetical errors discovered by the Employer in the evaluation of the Bids in accordance with Clause 28 hereof.

28. EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS

- 28.1 The basis and methodology for evaluation of the Qualification Particulars and techno-commercial bids shall generally be as described in the supplement to Instructions to Bidders attached as **Annexure-A to these ITB**. The Employer will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required securities and cost of Bid Document have been furnished, whether the documents have been properly signed, whether all the requisite declaration, undertakings have been furnished and whether the bids are generally in order.
- 28.2 The Price Bid duly filled in electronic form in conformity with the tender specification on the portal only. The Price Schedule is to be filled in for filling rates of the items to be filled in by the Bidder. The calculation of amount by multiplying the quantities with the rates filled in by the bidder, sub-totals, total etc. shall be done by formulae already provided in electronic form. In case of any discrepancy in the calculations, the rates shall be considered final and the amount calculated by using the same shall be corrected and considered as final. Where ever prices for items is left blank, in the Price Schedule, it shall be deemed to have been included in other items.
- 28.3 The Employer may waive any minor informality, non-conformity or irregularity in a bid that does not constitute a material deviation and that does not prejudice or affect the relative ranking of any Bidder as a result of the evaluation of Bids, pursuant to these Clauses.
- 28.4 Prior to the detailed evaluation, the Employer will determine whether each Bid is of acceptable quality, is complete and is substantially responsive to the Bid Documents. For purposes of this determination, a substantially responsive Bid is one that conforms to all the terms, conditions and specifications of the Bid Documents without material deviations, objections, conditionalities or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the Contract; (ii) that limits in any substantial way, inconsistent with the Bid Documents, the Employer's rights or the successful Bidder's obligations under the Contract; or (iii) whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids.

The Employer's determination of a Bid's responsiveness is to be based on the content of the Bid itself without recourse to extrinsic evidence.

- 28.5 If a Bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.
- 28.6 All the bidders shall be informed, about their status of qualification/disqualification/techno-commercial responsiveness, through a Notification on Websites mentioned at clause 11.

29 CONVERSION TO SINGLE CURRENCY FOR EVALUATION OF BIDS

- 29.1 For evaluating the price bids, the Employer will convert the amount quoted in various currencies in which the Bid Price is payable to the currency of the Employer's country using the exchange rate stated in the Bid data.

30. EVALUATION AND COMPARISON OF BIDS

- 30.1 In evaluating the Price Bids, the Employer will determine for each Bid the Evaluated Bid Price by adjusting the Bid Price as follows:
- a) making any correction for errors pursuant to Sub-clause 28.2;
 - b) converting the amount to a single currency in accordance with Clause 29;
 - c) Loading of cost of withdrawal, if any pursuant to Clause 13.2 (h)
- 30.2 The effect of the price adjustment provisions of the Conditions of Contract, applied over the period of Construction of the contract, shall not be taken into account in bid evaluation.
- 30.3 Any adjustments in price that result from the above procedures shall be carried out, for purposes of comparative evaluation only, to arrive at an "Evaluated Bid Price."
- 30.4 After arriving at L1 evaluated bid price through e-tender, the qualified bidders shall participate in E-Reverse auction process as follows:
- a) Eligibility Criteria for participation in e-RA:
 - i. Only techno-commercially responsive bidders with valid digital signature certificate, who participate in the initial e-tendering process, will be eligible to participate in the subsequent e-RA.
 - ii. Where number of eligible bidders at Price bid stage is one, then work shall be awarded to sole bidder, if the price of sole bidder is found reasonable and acceptable to SAPDC.
 - iii. Where number of eligible bidders at Price bid stage is two/three, then e-RA process will be conducted among all bidders.

- iv. Under no circumstances, there shall be less than two bidders participating in e-RA after elimination.
 - v. In case number of eligible bidders at price bid stage is four or more than four then, the highest (H1) bidder shall not be eligible for e-RA and e-RA will be conducted among rest of the bidders.
- b) e-RA will be done on total bid price and the unit rates of the successful bidder quoted in e-tender shall be reduced pro-rata to match with the e-RA bid price.
 - c) After technical evaluation of the bids & opening of price bids, the bidders, eligible for e-RA as per methodology above, will be intimated. Such qualified bidders shall be eligible to participate in the e-RA to be conducted by the e-procurement /e-RA service provider.
 - d) e-Procurement/e-RA service provider will guide the shortlisted bidders for this purpose and the Bidders shall abide by the Business Rules for e-RA as specified in the tender document.
- 30.5 **Start/Base Price:** For e-RA, **L1** evaluated bid price through e-tendering shall be taken as start/base price.
- 30.6 e-RA will be conducted on scheduled date & time which shall be conveyed to the eligible bidders through e-mail.
- 30.7 The start/base price and the minimum bid decrement value shall be available to qualified bidders only on the e-procurement website; sixty minutes before the start of e-RA Process.
- 30.8 The first online bid for e-RA shall be lesser than the price by minimum one decrement (0.1% of L-1 evaluated price). The subsequent online bids will be lesser than the first online bid by minimum one decrement value. The final bid shall prevail over the earlier bids.
- 30.9 The bidder will be able to view leading bid in the auction and/or his own rank, bid placed by him during the event, Opening Price, and Decrement price on screen along with other necessary fields in the e-RA. Names of bidders shall be displayed as dummy names to maintain anonymity.
- 30.10 **e-RA duration:** The duration of e-RA shall be initially for a period of one hour. However, in case any bidder places a bid within the last 10 minutes before scheduled closing of the e-RA and if the bid gets accepted and happens to be lowest, the duration for e-RA shall be increased by a further period of 10 minutes beyond scheduled closing time.
- Auto-extension:** The auto-extension takes place only in the last 10 minutes and there will be no limits for number of auto-extensions. However, in case there is no bid in the last 10 minutes before the closing of e-RA, then e-RA shall get closed automatically.
- 30.11 Proxy Reverse Auction feature: It is a pro-bidder feature to safe guard bidder's

interest against Internet failure or in case of bidders who don't wish to be present in entire e-RA duration but wish to quote a minimum price that is valid for them in entire e-RA duration. This feature allows bidders to place an automated bid against other bidders in the e-RA without having to enter revised bid again and again during the e-RA process. The proxy bid amount cannot be changed until the lowest bidding amount reaches the proxy bid amount, after which it can be lowered. Bids shall be submitted by the system on behalf of the proxy bidder in decrements i.e. decreasing bid amounts upto the proxy bid amount.

- 30.12 Bidders shall submit most competitive prices through e-tendering since these prices may be considered for final award in case e-RA event is not resorted to, due to reasons mentioned herein.
- 30.13 At the end of e-RA, the closing/final Price shall be available on screen. The ratio of closing/final price through e-RA and Originally quoted price through e-tendering shall be applied on all elements of originally quoted price to arrive at the final price break up (i.e. unit rates) which shall be considered further for final award.
- 30.14 **Loading:** Techno-commercial Cost loading (for non-compliance to SAPDC terms and conditions as applicable), if any will be carried out/or the deviations taken by the bidder and to determine the lowest evaluated bid. It shall be intimated to bidders prior to e-RA event and it shall be added to the quoted prices of respective bidder. Accordingly, the bidder(s) during e-RA should submit prices inclusive of cost of withdrawal of their respective deviations and/or other loadings so evaluated and intimated by SAPDC.

After the completion of e-RA, the Closing Price (CR) shall be available. In case, any commercial loading is made to L1 bidder's price, it shall be de-loaded from the closing price of LI bidder (CP) for further arriving at final breakup (i.e. Unit prices) and thereafter processing for award.

- 30.15 **Cancellation:** During e-RA, if no bid is received within the specified time duration of the e-RA, SAPDC, at its sole discretion, may decide to reschedule/scrap the e-RA process or finalize the tender based on Price Bids received through e-tendering if SAPDC does not decide to cancel/annul the tendering process for any reason and if the price of lowest bidder is found reasonable and acceptable to SAPDC.
- 30.16 On the basis of these terms and conditions, SAPDC, at any time before the placement of order on successful bidder, shall be at liberty to cancel, extend, reschedule the e-RA process or finalize the tender based on Price Bids submitted through e-tendering without assigning any reason.
- 30.17 **Award:** On the conclusion of e-RA successful bidder shall be the one whose e-RA price is lowest if considered reasonable at the sole discretion of SAPDC.
- 30.18 SAPDC's decision for award of Contract shall be final and binding on all the bidders.
- 30.19 **Limitation of Liability:** SAPDC or its e-procurement / e-RA service provider shall not be liable & responsible to bidders in any manner whatsoever for failure

- to access/interruption/delay & bid on the e-RA platform due to loss of Internet connectivity, power failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the auction event. On account of this, the time for the auction shall not be extended and SAPDC shall not be responsible for such eventualities. Further, in such cases, the decision of SAPDC shall be binding on the bidders.
- 30.20 SAPDC reserves the right to modify/withdraw any of the Business rules, terms & conditions of e-RA at any point of time prior, to commencement of e-RA. However, any modifications in Business rules, terms & conditions of e-RA shall be duly communicated to techno-commercially qualified bidders.
- 30.21 SAPDC will provide the calculation, sheet to the bidders as applicable which will help them to arrive at the total cost to enable them to keep it ready during e-RA.
- 30.22 The e-RA would be carried out in Indian Rupees or foreign currency converted into equivalent Indian Rupees only, on the date mentioned in bid document.
- 30.23 **System Accessibility:** The login ID and password for participating in e-RA will be the same as the one given to bidders on registration on e-procurement portal.
- 30.24 In case of any issue w.r.t. e-RA not specifically dealt with in Business Rules, the decision of the Employer/SAPDC shall be final and binding on all bidders.
-
- 30.25 If the Bid, which results in the lowest Evaluated Bid Price pursuant to e-RA or otherwise, is front loaded in relation to the Employer's estimate of the items of work to be performed at early stage under the Contract, the Employer may require to furnish additional performance security, to cover front loading and valid up to completion of Works, set forth in Clause 35 hereof at the expense of the bidder to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

F. AWARD OF CONTRACT

31. AWARD

- 31.1 Subject to Clause 32 hereunder, the Employer will award the contract to the Bidder, meeting the specified qualifying requirements and also whose Bid has been determined to be substantially responsive to the Bid Documents and who has offered the lowest evaluated bid price pursuant to Clause 30, provided that such Bidder has been determined to be eligible in accordance with the provisions of Clause 3 and 5 of ITB hereof and the Bidder has offered reasonable Bid Price compared to Employer's estimate.

32. EMPLOYER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

- 32.1 The Employer reserves the right to accept or reject any Bid, or cancel/withdraw invitation to Bid for any reason including national defence and security considerations, and annul the bidding process and reject all Bids at

any time prior to award of contract, without thereby incurring any liability to the affected Bidder(s).

33. NOTIFICATION OF AWARD

- 33.1 Prior to expiration of the period of Bid validity prescribed in the tender document, the Employer/SAPDC will notify the successful Bidder by email, fax and confirmed by registered letter or courier that its Bid has been accepted. This letter (hereinafter and in the Conditions of the Contract) shall be called the "Letter of Acceptance" as prescribed by the Contract.
- 33.2 The notification of award (Letter of Acceptance) will constitute the formation of the contract until the contract has been effected pursuant to clause 34 hereunder.
- 33.3 The unsuccessful bidders shall also be informed simultaneously about their status of Bids.
- 33.4 The award details shall also be posted on www.sapdc.com.np. www.sjvn.nic.in and www.eprocure.gov.in.

34. SIGNING OF INTEGRITY PACT AND CONTRACT AGREEMENT

- 34.1 After notifying the successful Bidder that its Bid has been accepted, the Employer/ SAPDC will prepare the Contract Agreement in the form provided in the Bid Documents, incorporating all agreements between the parties. The Integrity Pact be signed first, between Contractor & Employer/SAPDC then Contract Agreement shall be signed in two originals (one for Employer and one for Contractor). The Contractor shall provide to the Employer 7 (seven) photocopy sets of the Contract Agreement Document, in consultation with SAPDC i.e. with its volume wise binding, without any charges and after checking by the Employer, the Contractor shall also provide to the Employer one set of the Contract Document in the electronic form.
- 34.2 After issue of Letter of Acceptance, the Employer/SAPDC shall notify the Contractor about the readiness of the Agreement. The Employer and the successful Bidder shall sign the Agreement within 28 days from the date of issue of such notice to the contractor.
- 34.3 Upon issuance of Letter of Acceptance as per clause 33 hereof, Employer/SAPDC will notify the other Bidders that their Bids have been unsuccessful and their Bid Security/EMD will be returned.

35. PERFORMANCE SECURITY

- 35.1 Within 28 days from the date of issue of Letter of Acceptance, the successful bidder shall furnish to the Employer a Performance Bank Guarantee in the form stipulated in the Conditions of Contract with validity upto 60 days beyond the Defects Liability Period and additional Performance Security as per Clause 30.25

- 35.2 The bidders who are qualified on the strength of their Manufacturer(s) shall be required to furnish an additional Performance Bank Guarantee from their Manufacturer(s) as per Appendix to the Contract Agreement.
- 35.3 In case Bidding Company (subsidiary company) gets qualified and awarded the work package, the Parent company/Holding Company, within 28 days from the date of issue of Letter of Acceptance, will be required to furnish an additional performance bank guarantee, as per Appendix to the Contract Agreement, of value equivalent to 3% (three) percent of the Contract Price or portion of work (where subsidiary Company is Joint Venture Partner) as the case may be, in addition to normal Performance Bank Guarantee to be submitted by the Bidder to the Employer besides entering into a separate agreement in the requisite Format provided in the Bid Document.
- 35.4 The form of Performance Bank Guarantee provided in Section 4, of the Bid Documents may be used.
- 35.5 Failure of the successful bidder to comply with the requirements of Clause 34 or 35 hereof shall constitute a breach of Contract, cause for annulment of the award, forfeiture of the Bid Security/EMD, and any such other remedy the Employer may take under the provisions of the Contract.

36. PERMANENT ACCOUNT NUMBER (PAN) and VAT Registration

Within 28 days from the date of issue of the Letter of Acceptance, the successful Bidder shall furnish to the Employer his Permanent Account Number issued by the income tax authorities in Nepal and VAT registration number. No payment shall be made to the Contractor unless he submits his Permanent Account Number and VAT registration number.

37. CORRUPT OR FRAUDULENT PRACTICES

- 37.1 It is expected from the Bidders that they will observe the high standard of ethics during the bidding process and Construction of such Contracts. In pursuance of this policy:
- (a) For the purpose of this provision, the terms set-forth below shall mean as under:
- (i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract Construction.
- (ii) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the Construction of a Contract
- (iii) "collusive Practice" means a scheme or arrangement between two or more bidders, with or without the knowledge of Client, designed to establish bid prices at artificial, non-competitive levels.

- (iv) "coercive Practice" means harming or threatening to harm, directly or indirectly, person or their property to influence or affect the Construction of Contract.

- (b) A Bid shall be rejected by the Employer/SAPDC if it is determined at any stage that respective Bidder has engaged in corrupt or fraudulent or Collusive or Coercive practices in competing for or in executing the Contract in question and his Bid Security shall be forfeited. The Contractor shall not be entitled for any compensation whatsoever under this clause.

- (c) The Employer may declare a bidder ineligible, either indefinitely or for a stated period of time, to be awarded a Contract if it at any time determines that the bidder has engaged in corrupt or fraudulent or collusive or coercive practices in competing for, or in executing a Contract.

- (d) The documents/information submitted by Contractor may be verified by the officials of the Employer/SAPDC for its authenticity at any time and the Contractor shall provide all facilities/co-operation in this regard. If it is found that any of the documents/information submitted by the Contractor is not genuine, the Employer shall have full rights to cancel his Bid, forfeit the bid security and terminate the Contract, if awarded.

38. E-Payment

The Successful Bidder/Contractor shall have to furnish the following information for receiving payments in Nepal against the Work through e-payment system:

1. Name of Beneficiaries:
2. Name of the Bank:
3. Branch of the Bank:
4. Account No.:
5. Swift Code:
6. City/Town:
7. Fax No.:
8. Telephone No.:
9. E-mail address:

39. Integrity Pact alongwith Undertaking:-

39.1 To improve transparency and fairness in the tendering process, SAPDC is implementing Integrity Pact To improve transparency and fairness in the tendering process the Employer is implementing Integrity Pact. Integrity Pact is deemed as part of the contract

so that the prospective bidders are bound by its provisions.

The Integrity Pact, signed by all the prospective Bidders and the Employer/SAPDC, shall commit the persons/officials of both the parties, not to exercise any corrupt/fraudulent/collusive/coercive practices in the Tendering process and also during implementation of the Contract. Only those Bidders who have entered into Integrity Pact with the Employer shall be eligible to participate in the bidding process. Bidders signing Integrity Pact shall not approach the Courts while representing the matters to IEMs and he/she will await their decision in the matter.

Entering into Integrity Pact as per Performa (**As per Contract Forms- Section-4, Volume-I of Tender Document**) is a basic qualifying requirement. In case of JV, each partner of JV shall sign Integrity Pact with the Employer. In case of sub-contracting, the Principal contractor shall be responsible for adoption of Integrity Pact by the sub-contractor.

To oversee the compliance of obligation under the Integrity Pact, a panel of Independent External Monitor(s) (IEMs) have been appointed by concerned authority. The Contact address of IEMs are as under:

Sl. No.	Name of IEMs	Address of IEMs
1.	Sh. S.P. Srivastava, IPS (Retd.)	1/125, Vineet Khand, Gomtinagar, Lucknow, UP-226010 , Email: sps_ips@yahoo.com
2.	Smt. Archana Pandey Tiwari, IRS (Retd.)	C-32, Nangal Dewat, Vasant Kunj, New Delhi-110070, Email: ampandey2001@yahoo.com

The Integrity Pact duly signed on behalf of SAPDC is enclosed at **Contract Forms- Section-4, Volume-I of Tender Document** of the Bid Document. The Integrity Pact shall be downloaded, printed and signed by the bidder and the hard copy shall be submitted in Part-I of Bid.

- 39.2 The successful bidder shall submit duly executed Integrity Pact on plain paper prior to signing of Contract Agreement. The Integrity Pact duly signed on behalf of the Employer has been enclosed under in this document. The Integrity Pact shall be printed & signed by the bidder/supplier and the hard copy shall be submitted in Part-I (Envelope-I).

1.0 Technical Evaluation:

Technical Evaluation shall be carried out on the basis of technical submission by the Bidder, which will include the information and data provided by Bidders as specified in the Data Sheets:

- Personnel capabilities; Personnel Candidate data (Data Sheet 1 and 1A).
- Proposed Site Organization (Data Sheet 2).
- Erection Programme (Data Sheet 3)
- Erection Methodology (Data Sheet 4)
- Quality control organization and procedures

2.0 In addition, the Bidders are expected to provide full details of Procedures for coordinating Works with other contractors and suppliers, as well as with the Employer in such a way as to avoid delays or other difficulties during the Execution of Works.

2.1 To facilitate completion of the technical evaluation in the limited time available, Bidders are advised.

- To submit their technical documentation and all other data in the form and order indicated in the data sheets and/or as instructed above, and to ensure that all specific points on which information has to be submitted, as detailed in the Instructions to Bidders and any addenda thereto, are fully covered.
- To ensure that the documentation submitted is complete in all respects but also concise.

2.2 As the Programme for Bid evaluation is short, the Employer/SAPDC cannot accept any obligation to request clarifications or substantiating information after bids have been submitted.

3.0 Even though the bidders meet the minimum qualifying criteria as per clause no 5.5(ITB), they are subject to be disqualified if they have:

- (i) made misleading or false representations in the forms, statements, declarations and attachments submitted in proof of the qualification requirements; and/or
- (ii) record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.

BID DATA

The following specific data for the Works to be procured shall complement, amend, or supplement the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in Instructions to Bidders.

Instructions to Bidders (ITB) Clause Reference	
1.1& 1.2	Summary of Works: Hydro-Mechanical Works- Pressure Shaft steel liner package of Arun-3 HEP, Distt. Sankhuwasabha, Nepal
1.1	Name and Address of the Employer: SJVN Arun-3 Power Development Company (P) Ltd. (SAPDC), Satluj Bhawan, Tumlingtar, Nepal, having its registered office at Lokanthali, Kathmandu, Nepal.
1.2	Period of Completion: 9 Months
5.1	Qualifying Requirement: The Bidder who wishes to participate in the bid should satisfactorily meet the qualifying requirements stipulated in ITB Clause-5.5
15.5	The Contract is subject to price adjustment as provided in the Appendix to the Contract.
16	Country of the Employer: Nepal
16	Currency of the Employer's Country: Nepalese Rupees
17.1	Period of Bid Validity: 180 days
18.1	Amount of Bid Security/EMD: INR 1,60,00,000/- (Indian Rupees One Crore Sixty Lakh only) OR NPR 2,56,00,000/- (Nepalese Rupees Two Crore Fifty Six lakh only)
19.1	Clarifications on bid document (if required): The bidders are requested to submit their queries for clarifications through e-mail up to 15.02.2022(1700 Hrs) only, which shall be responded to and clarified as per clause 11.0 of ITB.
21.7	SAPDC/Employer's address for offline submission of bids: In the O/o Chief Engineer (P&C), SAPDC, Satluj Bhawan, Arun Sadan, Tumlingtar, Distt. Sankhuwasabha, Nepal, Ph. +977-29-575154, 9852099789

	<p>or</p> <p>In the Office of Company Secretary, SJVN Arun- 3 Power Development Company (SAPDC) at 3rd floor, Citizen Investment Trust (CIT) Building, New Baneshwor, Kathmandu, Nepal, wherein the bids shall be received only till two days prior to the last date for submission of bids. Contact No: +977 9819822967</p>
21.6	Number of the Contract: ICB-P&C-AHEP-HM-C-5/2023-
22	<p>Deadline for submission of bids:</p> <p>Online & Offline Submission: upto 02.03.2023 (1700 Hrs.)</p>
25	<p>Venue, time and date of bid opening:</p> <p>Venue: In the O/o Chief Engineer (P&C), SAPDC, Satluj Bhawan, Arun Sadan, Tumlingtar, Distt. Sankhuwasabha, Nepal.</p> <p>Techno- Commercial Bid (Part/Envelope-I): Online & Offline Bid opening on 03.03.2023 at 1100 Hrs.</p> <p>Price Bid (Part/Envelope-II) : Shall be notified later on, separately on following websites: www.sapdc.com.np, www.sjvn.nic.in/tender.htm, & www.eprocure.gov.in, (Only i.r.o. the bidders meeting the specified qualifying criteria and also whose Techno-Commercial Bids are found responsive).</p>

QUALIFICATION FORMS
(Refer ITB sub-clause 13.1 (c))

APPLICATION FORM - 1

PAGE ___ OF ___ PAGES

General Information

Applicants are requested to complete the information in this form.

1.	Name of firm	In case of joint venture/consortium/Manufacturer(s) () Lead Partner () Partner () Manufacturer(s)
2.	Head office address <i>Country:</i>	
3.	Telephone Fax Email	Contact Person(s) Name Title/Position
4.	Place of incorporation / registration Date	
5.	Legal status of firm	Field of specialty in business
6.	Nationality of majority of owners or share-holders	Number of management executives Persons
7.	Number of present permanent employees: Name of Country All other branches	(unit: persons) Other Non- Engineers Engrs. Engineering
8.	Quality assurance system in head office	Certified by:
9.	Representative Name Address Telephone Fax & Email	

Date _____

Signature _____

APPLICATION FORM - 2
General Experience Record

PAGE ___ OF ___ PAGES

Name of the Construction Company (Sole Applicant) or Partner/member of a Joint venture/Consortium

*Applicants are requested to complete the information in this form.
 Use a separate sheet for each Partner/member of a joint venture/consortium.*

1. Average Annual Turnover

The information supplied should be the annual turnover of the Applicant (separately for each partner of a joint venture/ each member of a consortium), in terms of the amounts paid by the clients for each year in the last best 3 (three) Financial years out of five (5) years. Unless specifically asked for, Applicants need not to enclose testimonials, certificates, and publicity material with their applications; they will not be taken into account in the evaluation of qualifications.

Fiscal Year	Turnover (in INR)
1017-18	
2018-19	
2019-20	
2020-21	
2021-22	
Average Annual Turnover	

2. General Experience

Experience of Hydro-Mechanical work in the last Twenty (20) years to demonstrate the Applicant's business experience should be listed in separate sheets in a form as shown below:

No.	Name of Project	Country	Applicant's own works done	Role of the Applicant (sole contractor, or partner in JV/Consortium)	Contract period m/yr to m/yr	Contract Value
1						
2						
3						
4						

Date _____

Signature _____

NB: To please attach detailed data sheet wherever possible.

APPLICATION FORM - 2A

PAGE ____ OF ____ PAGES

Joint Venture/Consortium Summary

In case of joint venture/consortium, this form is requested to be filled and attached to Form 2.

1. Members of Joint Venture/Consortium

Names of all Partners of a joint venture		Proposed participation	Proposed portion of work
1. Lead Partner		%	
2. Partner		%	

2. Summary of Average Annual Turnover

Total value of annual construction turnover, in terms of the amounts paid by the clients for each Financial year in the last five (5) years:

		Annual Turnover – Summary				
Partner	Form 2 page no.	Year 1	Year 2	Year 3	Year 4	Year 5
1. Lead Partner						
2. Partner						

Indicate responsibility in respect of planning, equipment, key personnel and execution of the work of the lead firm of the joint venture/consortium and of each of the joint venture/consortium partners.

Date _____

Signature _____
by Lead Partner

APPLICATION FORM-3

PAGE ____ OF ____ PAGES

Specific Experience Record

Name of Construction Company (Sole Applicant); Partner of a joint venture/consortium and/or Manufacturer(s):

On a separate page, using the format of Form-3A, each firm (Sole Applicant); Partner of a joint venture/consortium and/or Manufacturer(s) is requested to list all contracts of a similar nature undertaken and completed in past or ongoing, on the basis of which the Applicant wishes to qualify. The value should be based on the currencies of the contracts converted to INR, at the date of substantial completion. The Specific Experience should include the following:

Pressure shaft Steel liner

Fabrication/manufacturing, erection, testing and commissioning of one no. pressure shaft steel liner having a value of D x H not less than 1000 m² Where, D= Internal diameter expressed in m and H= maximum Design Head in (m).

The information in Form-3A to be summarized in the table form as shown below.
 Summary – Completed contracts of similar nature:

Name of Project (Reported on Form-3A)	Country	Name of	Contractor's (lead partner of JV/Consortium or otherwise)	Contract value in INR	Schedule Completion/actual Completion (month/year)

Date _____

Signature _____

- * i) Exchange rate as on date of award of Contract.
- ii) Mention exchange rate adopted.

NB: To please attach detailed data sheet wherever possible.

SUMMARY OF FULFILMENT OF TECHNICAL CRITERIA
(To be submitted by the Bidder)

S.No	Qualifying Criteria	Reference (Page No.)
A. General Experience		
	Applicant (Prime contractor or as partner in a JV/Consortium or Sub-contractor approved by the respective employer) should have executed at least one Hydro-Mechanical work of contract value INR 76 Crore or more during the preceding twenty (20) years to be reckoned from the last day of month previous to the month in which applications are invited and which are in successful operation. In case of ongoing projects, the value of completed work shall be considered.	
	Technical Criteria (Specific Experience) Applicant either itself or proposed Manufacturer(s), who have given authorization to the Applicant, should have experience in the design, procurement fabrication, shop assembly, painting, shop testing, supply, transportation, erection, testing and commissioning of the following Hydro-Mechanical works and pressure shaft steel liner works in a completed project during the preceding twenty (20) years to be reckoned from the last day of month previous to the month in which applications are invited.	
	Pressure shaft Steel liner Fabrication/manufacturing, erection, testing and commissioning of one no. pressure shaft steel liner having a value of D x H not less than 1000 m ² Where, D= Internal diameter expressed in m and H= maximum Design Head in (m).	

Applicant

APPLICATION FORM - 3A

PAGE ___ OF ___ PAGES

Details of Completed and current Contracts of Similar Nature

Name of Construction Company (Sole Applicant); Partner of a joint venture/Consortium and/or Manufacturer(s):

Use a separate sheet for each contract.

List all relevant works completed in past, for which the Bidder wishes to qualify.

1	Name of project	Installed capacity: _____MW
	Country	State/Province
	Name of river	Annual mean discharge of river: Approx. m³/s
2	Name of employer Contact Person Address	Telephone Fax Email
3	Name of contract	
4	Nature of works (Steel liner etc.) and special features (site conditions, remoteness, etc.) relevant to the contract for which the Applicant wishes to qualify:	
5	Contract role (check one) () Prime contractor () Subcontractor	() Lead Partner in a joint venture/consortium () Partner in a joint venture/Consortium
6	Value of contract Currency:	of which, Applicant's share was: %
7	Time period as per Contract Document (years and months)	Date of award: Date of actual completion:
8	<i>Works done (Bidder is to add or delete items to demonstrate qualification):</i>	

	<p>Pressure shaft Steel liner</p> <p>Fabrication/manufacturing, erection, testing and commissioning of one no. pressure shaft steel liner having a value of $D \times H$ not less than 1000 m² Where, D= Internal diameter expressed in m and H= maximum Design Head in (m).</p>

Date _____

Signature _____

NB: To please attach detailed data sheet wherever possible

APPLICATION FORM - 4

PAGE ____ OF ____ PAGES

Current Contract Commitments / Works in Progress

Name of Construction Company (Sole Bidder); Partner of a joint venture/Consortium and/or Manufacturer(s):

Bidder should provide information on their current commitments on all construction contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion.

Name of contract	Description of works	Stipulated date of completion	Contract Value (equivalent INR)*	Value of outstanding work (equivalent INR)*	Estimated completion date
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

- * i) Exchange rate as on date of award of Contract.
 ii) Mention exchange rate adopted.

Date _____

Volume -3
General Conditions
and Contract Forms

Section -3 General Conditions (GC)

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General Conditions

Contract and Interpretation

1. Definitions

1.1 The following words and expressions shall have the meanings hereby assigned to them:

"Contract" means the Contract Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term "the Contract" shall in all such documents be construed accordingly.

"Contract Documents" means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).

"GC" means the General Conditions hereof.

"day" means calendar day .

"year" means 365 days.

"month" means calendar month.

"Party" means the Employer or the Contractor, as the context requires, and "Parties" means both of them.

"Letter Of Acceptance" means the letter of formal acceptance signed by the employer, of the letter of tender, including any annexed memoranda comprising agreements between and signed by both the parties.

"Employer" means SAPDC (SJVN Arun-3 Power Development Company (P) Ltd.) and includes the legal successors or permitted assigns of the Employer.

EIC means the person appointed by the Employer in the manner provided in GC Sub-Clause 17.1 EIC hereof to perform the duties delegated by the Employer.

"Contractor" means the person(s) whose bid to perform the Contract has been accepted by the Employer and is named as Contractor in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

"Contractor's Representative" means any person nominated by the Contractor and approved by the Employer in the manner provided in GC Sub-Clause

17.2 (Contractor's Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

"Construction Manager" means the person appointed by the Contractor's Representative in the manner provided in GC Sub-Clause 17.2.4.

"Subcontractor," including manufacturers/suppliers/Manufacturer(s), means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant, is sub-contracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns.

"Contract Price" means the sum specified in the Letter of Acceptance and under Article 2.1 (Contract Price) of the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

"Facilities" means the Plant to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.

"Plant" means permanent plant, equipment, machinery, apparatus, materials, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GC Sub-Clause 7.3 hereof), but does not include Contractor's Equipment.

"Installation Services" means all those services ancillary to the supply of the Plant for the Facilities, to be provided by the Contractor under the Contract, such as transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of Contractor's Equipment and the supply of all construction materials required), installation, testing, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc. as the case may require.

"Contractor's Equipment" means all facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to

be provided by the Contractor, but does not include Plant, or other things intended to form or forming part of the Facilities.

“Country of Origin” means the countries and territories eligible under the rules of Govt. of Nepal.

‘Government’ or ‘GoN’ means the Government of Nepal.

“Site” means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.

“Effective Date” means the date of issuance of Letter of Acceptance, from which the Time for Completion shall be counted.

“Time for Completion” means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) is to be attained, as referred to in GC Clause 8 and in accordance with the relevant provisions of the Contract.

“Completion” means that the Facilities (or a specific part thereof where specific parts are specified in the Contract) have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Pre-commissioning of the Facilities or such specific part thereof has been completed, and that the Facilities or specific part thereof are ready for Commissioning as provided in GC Clause 24 (Completion) hereof.

“Pre-commissioning” means the testing, checking and other requirements specified in the Employer’s Requirements that are to be carried out by the Contractor in preparation for Commissioning as provided in GC Clause 24 (Completion) hereof.

“Commissioning” means operation of the Facilities or any part thereof by the Contractor following Completion, which operation is to be carried out by the Contractor as provided in GC Sub-Clause 25.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

“Guarantee Test(s)” means the test(s) specified in the

Employer's Requirements to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, in accordance with the provisions of GC Sub-Clause 25.2 (Guarantee Test) hereof.

"Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GC Clause 25 (Commissioning and Operational Acceptance) hereof.

"Defect Liability Period" means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GC Clause 27 (Defect Liability) hereof.

2. Contract Documents

- 2.1 The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and constructed as an integral part of the Contract:
- (a) This Contract Agreement and the Appendices hereto
 - (b) Letter of Bid and Price Schedules submitted by the Contractor.
 - (c) General Conditions.
 - (d) Technical Specifications.
 - (e) Drawings.
 - (f) Other completed bidding forms submitted with the bid.
 - (g) Any other documents forming part of the Employer's Requirements.
 - (h) Any other documents shall be added here.

2.2 Order of Precedence

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Subject to Article 2.1 (Contract Documents) above.

2.3 Definitions (Reference GC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

3. Interpretation 3.1 In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word "agree," "agreed," or "agreement" require the agreement to be recorded in writing;
- (d) the word "tender" is synonymous with "bid," "tenderer," with "bidder," and "tender documents" with "bidding documents," and
- (e) "written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

3.2 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of Parties thereunder shall be as prescribed by *Incoterms*.

Incoterms means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1^{er},

75008 Paris, France.

3.3 Entire Agreement

Subject to GC Sub-Clause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of Parties with respect thereto made prior to the date of Contract.

3.4 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each Party hereto.

3.5 Independent Contractor

The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture or other joint relationship between the Parties hereto. Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or Subcontractors and the Employer.

3.6 Non-Waiver

3.6.1 Subject to GC Sub-Clause 3.6.2 below, no relaxation, forbearance, delay or indulgence by either Party in enforcing any of the terms and conditions of the Contract or the granting of time by either Party to the other shall prejudice, affect or restrict the rights of that Party under the Contract, nor shall any waiver by either Party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.6.2 Any waiver of a Party's rights, powers or

remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the Party granting such waiver, and must specify the right and the extent to which it is being waived.

3.7 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

3.8 Country of Origin

“Origin” means the place where the plant and component parts thereof are mined, grown, produced or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

4. Communications

4.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- (a) in writing and delivered against receipt; and
- (b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Contract Agreement.

When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the EIC, a copy shall be sent to the EIC or the other Party, as the case may be.

5. Law and Language

5.1 The Contract shall be governed by and interpreted in accordance with laws of the Govt. of Nepal.

5.2 The ruling language of the Contract shall be English.

5.3 The language for communications shall be the ruling language of the Contract.

6. Fraud and

6.1 If the Employer determines that the Contractor

Corruption

and/or any of its personnel, or its agents, or its Subcontractors, sub-consultants, services providers, suppliers and/or their employees has engaged in corrupt, fraudulent, collusive coercive, or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 42 shall apply as if such expulsion had been made under Sub-Clause 42.2.1 (c).

For the purposes of this Sub-Clause,

- (i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party
- (ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation
- (iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) "obstructive practice" is
 - (a) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the

investigation, or

Subject Matter of Contract

7. Scope of Facilities

- 7.1 Unless otherwise expressly limited in the Employer's Requirements, the Contractor's obligations cover the provision of all Plant and the performance of all Installation Services required for the design, and the manufacture (including procurement, quality assurance, fabrication, installation Pre-commissioning and delivery) of the Plant, and the installation, completion and commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Section, Employer's Requirements. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor, materials, equipment, spare parts (as specified in GC Sub-Clause 7.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage, except for those supplies, works and services that will be provided or performed by the Employer, as set forth in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer.
- 7.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.
- 7.3 In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period of five years. However, the identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in

Sub-Price Schedule No. 3-A and 3-B, which shall not be added to the Contract Price. The price of such spare parts shall include the purchase price therefor and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.

The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the Plant. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order. In addition, in the event of termination of the production of spare parts, advance notification will be made to the Employer of the pending termination, with 12 months time to permit the Employer to procure the required spare parts. Following such termination, the Contractor shall provide at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested.

8. Time for Commencement and Completion

- 8.1 The Time for Commencement shall be the date of issue of Letter of Acceptance by the Employer and without prejudice to GC Sub-Clause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Appendix to the Contract Agreement titled Time Schedule.
- 8.2 The contractor shall attain Completion of the Facilities or of a part where a separate time for completion of such part is specified in the contract, within the time specified in the milestones or within such extended time to which contractor shall be entitled under GC clause 40 hereof.

9. Contractor's Responsibilities

- 9.1 The Contractor shall design, manufacture including associated purchases and/or subcontracting, install and complete the Facilities in accordance with the Contract. When completed, the Facilities should be fit for the purposes for which they are intended as defined in the Contract.
- 9.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities including any data as to boring tests if provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site if access thereto was available and of other data readily

available to it relating to the Facilities as of the date twenty-eight (28) days prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

- 9.3 The Contractor shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GC Sub-Clause 10.3 hereof and that are necessary for the performance of the Contract.
- 9.4 The Contractor shall comply with all laws in force in the country where the Facilities are to be implemented. The Contractor shall comply with all applicable laws, ordinances, codes, approved standards, rules and regulations. The laws will include all local, state, national or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GC Sub-Clause 10.1 hereof.
- 9.5 Any Plant and Installation Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GC Clause 1 (Country of Origin). Any subcontractors retained by the Contractor shall be from a country as specified in GC Clause 1 (Country of Origin).
- 9.6 If the Contractor is a joint venture, or association (JVA) of two, or consortium, all such persons shall be jointly and severally bound to the Employer for the

fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the JVA. The composition or the constitution of the JVA shall not be altered without the prior consent of the Employer.

10. Employer's Responsibilities

10.1 All information and/or data to be supplied by the Employer as described in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, shall be deemed to be accurate, except when the Employer expressly states otherwise.

10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.

10.3 The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which (a) such authorities or undertakings require the Employer to obtain in the Employer's name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract, and (c) are specified in the Appendix (Scope of Works and Supply by the Employer).

10.4 If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the

Employer shall provide sufficient, properly qualified operating and maintenance personnel; and shall perform all work and services of whatsoever nature, including those required by the Contractor to properly carry out Pre-commissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, at or before the time specified in the program furnished by the Contractor under GC Sub-Clause 18.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.

10.6 The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GC Sub-Clause 24.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GC Sub-Clause 25.2.

10.7 All costs and expenses involved in the performance of the obligations under this GC Clause 10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GC Sub-Clause 25.2.

10.8 In the event that the Employer shall be in breach of any of his obligations under this Clause, the additional cost incurred by the Contractor in consequence thereof shall be determined by the EIC and added to the Contract Price.

Payment

11. Contract Price

11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.

11.2 The Contract Price shall be adjusted in accordance with the provisions of the Appendix to the Contract Agreement titled Price Adjustment, Subject to GC Sub-Clauses 9.2, 10.1 and 35 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

DEDUCTIONS FROM CONTRACT PRICES

- 11.3 All costs, claims, damages or expenses which the Employer may have paid for which under the Contract the Contractor is liable, may be deducted by the Employer from the proceeds of the Performance Guarantee or from any money due or which may become due to the Contractor under the Contract.
- 11.4 Any sum of money due and payable to the Contractor (including Performance Guarantee returnable to him) under this Contract may be appropriated by the Employer and set off against any claim of the Employer out of or under any Contract made by the Contractor with the Employer.
- 11.5 It is an agreed terms of the Contract that the sum of money so withheld if retained under this clause by the Employer shall be kept, withheld or retained as such by the Employer till the claims arising out of in the same Contract are either mutually settled or determined by the arbitrator, and the Contractor shall have no claim for interest or damage whatsoever on this account or any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the Contractor.

12. Terms of Paym ent

12.1 The Contract Price shall be paid as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement and in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which also outlines the procedures to be followed in making application for and processing payments.

12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.

12.3 Omissions on the part of the EIC to pay the amount due upon measurement or otherwise shall neither vitiate nor make the Contract void. Further, no claim for interest or damages will be entertained or payable by the Employer upon:

- i) any Bank Guarantee or
- ii) payments in arrears or
- iii) any balance which may become due on final settlement / re-conciliation of the account or

iv) withheld by the Employer owing to any dispute or difference between the Parties.

Save as above, if the Contractor does not receive undisputed payment, the Contractor shall be entitled to receive simple interest as financing charges on the amount unpaid during

All the payments for the supplies and/or services (as applicable) rendered by Contractor under the contract shall be released within forty five (45) days from the receipt of invoice/bills form the Contractor complete in all respects.

In case payments are not released as mentioned above, SAPDC shall pay the principal amount plus simple interest from the date immediately following the date agreed upon @ 8% p.a.

The Contractor shall be entitled to this payment without formal notice and without prejudice to any other right or remedy.

Further no interest will be paid on disputed claim amount.

12.4 The currency or currencies in which payments are made to the Contractor under this Contract shall be Nepalese Rupees only.

12.5 *The Contractor shall open a dedicated account in Nepal for the Facilities of the Project and all payments to Contractor shall be released to dedicated account only. The payment released to the Contractor against this Contract shall be solely utilized for the Facilities and shall not be diverted for other purpose. In case, the Contractor wants to utilize the payment for clearing his other liabilities, he may do so with the prior permission of EIC."*

The Due payments for Main Price Schedule – 1A (Supply Portion) in INR currency shall be released in a dedicated account opened by contractor in India directly or through LC. The payment released to the Contractor against this Contract shall solely be utilized for the Facilities and shall not be diverted for other purpose. In case, the contractor wants to utilize the payment for clearing his other liabilities, he may do so with the prior permission of EIC. Further, time taken on account of seeking approval from GON Authorities for releasing payment to India directly or through LC will be on account of Contractor.

12.6 – Material Advance Payment:

1) If engineer is satisfied with the request of contractor, the employer will make payment of interest-bearing advance for specified Material upon submission of unconditional Bank Guarantee (120 % of advance amount) :

a) If advance is requested for already purchased Specified Material, the contractor shall submit the copy of Purchase Order, Invoice and delivery challan and documents evidencing delivery of material etc;

b) If advance is requested for Specified Material to be purchased for the project requirement, the contractor shall submit i) Performa Invoice and copy of purchase order along with the application for advance. The contractor shall ensure to take delivery of material as per delivery schedule provided in the Performa Invoice.

For the purpose of this clause specified material means "Steel plate for Pressure Shaft Steel Liner ASTM A 537, ASTM A517 purchased or to be purchased from the approved vendors for the requirement of project.

The advance shall be released after verification of unconditional & acceptable Bank Guarantee provided by the contractor for an amount equal to 120% of the advance payment. The Bank guarantee for advance payment shall be in favour of SJVN Arun- 3 Power Development Company Pvt Ltd from a Bank Acceptable to the employer.

The Bank Guarantee shall be issued by any "A" class Bank in Nepal for the amounts expressed in Nepalese Rupees. The Bank Guarantee in INR shall be acceptable only if these are issued by a Scheduled Bank of India duly counter guaranteed by any "A" class bank in Nepal. Such Bank Guarantee shall remain effective until the advance amount along with interest has been fully repaid.

2) The advance payment plus interest thereon shall be recovered from the amount due to the contractor for delivery of BoQ items acceptable to the Employer, for which the advance for material provided by the employer to the extent of material consumed in the manufacturing of such parts. The total interest amount due upto preceding month shall be recovered along with principal from each RA bill till the advance against is fully repaid.

Rate of Interest for the purpose of this clause shall be as provided in the Appendix I i.e Terms and Procedure of Payment of the Contract Agreement. The interest shall be charged on monthly rest basis reckoned from the date of release thereof. If for any reason, the payment due is insufficient to recover the full interest and principal together, interest shall be credited/recovered first and the residual applied to the principal. However, in case, full interest itself cannot be recovered, the balance amount of unrecovered interest shall also carry the same interest rate as specified in Sr. no. (i) under "Appendix-1 for Terms and Procedures of payment.

However, Engineer is entitled to recover the advance payment along with due interest from due payments of contractors or by encashment of bank guarantee in case, contractor fails to supply the material within the time limit provided in the Contract Agreement or Supplementary Agreement/s or fails to take delivery of material within the time allowed in the condition 1 b) above.

The Contractor shall always have the option to limit the drawl of advance to the extent desired and to have the recoveries commenced and/or completed earlier and/or have recoveries effected in instalments of higher amounts and also to repay part or whole of the advance by direct payment rather than through Interim Payment Certificates/RA bills.

3) Should there arise any occasion under the Contract due to which the periods of validities of Bank Guarantees as may have been furnished by the Contractor from time to time, are required to be extended/renewed, the Contractor shall at his cost get the validity periods of such guarantees

extended/renewed, and furnish these to the Engineer in charge one month before the expiry date of the aforesaid Guarantees originally furnished; failing which the existing Bank Guarantees shall be invoked by the Engineer in charge.

If the advance payment has not been repaid prior to the issue of the Operational Acceptance Certificate for the Works or prior to termination under GC Clause 42 [Termination], GC Clause 41[Suspension], GC Clause 37 [Force Majeure] or GC Clause 38 [War Risk] (as the case may be), the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Employer.

4) The responsibility to procure the material at reasonable rates rests with the contractor and the rates of material shall not have any reference or can not be used for any reference in respect to other contract provisions.

5) The Contractor shall open a Dedicated Bank account to be operated jointly by SAPDC and Contractor, for the Works of the Project and all payments to Contractor shall be released to said dedicated Bank account only. The payment released to the Contractor against this Contract shall be solely utilized for the Works and shall not be diverted for any other purpose. A certificate along with each bill shall be submitted by Contractor to the effect that the payment receipts from the Contract have been utilized for the project works alone.

Performa for Bank Guarantee as attached herewith-
Annex-9

13. Securities **13.1 Issuance of Securities**

The Contractor shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner and form specified below.

13.2 Advance Payment Security

13.2.1 The Contractor shall, within twenty-eight (28) days of the issuance of Letter of Acceptance, provide a security in an amount equal to 1.2 times the advance payment calculated in accordance with the Appendix to the Contract Agreement titled Terms and Procedures of Payment, and in the same currency .

13.2.2 The security shall be in the form provided in the bidding documents or in another form acceptable to the Employer. The amount of the security shall be reduced in proportion to the value of the Facilities executed by and paid to the Contractor from time to time, and shall automatically become null and void when the full amount of the advance payment has been recovered by the Employer. The security shall be returned to the Contractor immediately after its expiration.

13.3 Performance Security

13.3.1 The Contractor shall, within twenty-eight (28) days of the issuance of Letter of Acceptance, provide a security for the due performance of the Contract for an amount equivalent to 3% of the Contract Price in currency of the bid with validity upto 60 days beyond the Defects Liability Period.

13.3.2 The performance security shall be denominated in the currency or currencies of the Contract, or in a freely convertible currency acceptable to the Employer, and shall be in the form provided in Contract Forms, corresponding to the type of bank guarantee stipulated by the Employer, or in another form acceptable to the Employer. The Performance Security of a joint venture shall be in the name of individual partner of Joint Venture in proportion of its participation share. The performance bank guarantee shall be issued by any "A" class Bank in Nepal for the amounts expressed in Nepalese Rupees (NPR). The Bank Guarantees in INR shall be acceptable only if these are issued by a Scheduled Bank of India duly counter guaranteed by any A class Bank in Nepal.

Without limitation to the provisions of the preceding paragraph, whenever the EIC determines an addition to the Accepted Contract

Amount as a result of a change in cost and/or legislation or as a result of a variation amounting to more than 25 percent of the Accepted Contract Amount, the Contractor, at the EIC's written request, shall promptly increase the value of the performance security by an equal percentage. In case of Joint Venture, the value of performance bank guarantee shall be got enhanced by individual partners of JV in the proportion of their participation share.

13.3.3 Unless otherwise specified, the security shall be reduced by half on the date of the Operational Acceptance. The Security shall become null and void, or shall be reduced pro rata to the Contract Price of a part of the Facilities for which a separate Time for Completion is provided, four hundred twenty five (425) days after Completion of the Facilities or three hundred and sixty five (365) days after Operational Acceptance of the Facilities, whichever occurs first; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GC Sub-Clause 27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor, pursuant to GC Sub-Clause 27.10, is liable for an extended defect liability obligation, the performance security shall be extended 60 days beyond the Defects Liability Period pursuant to GC Sub-Clause 27.10 and up to the amount 3%.

13.3.4 The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract. The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

13.4 In case, the Contractor is a Subsidiary Company, the parent/holding company will be required to furnish an additional performance bank guarantee

of value equivalent to 3% percent of the Contract Price or portion of work (where the subsidiary company is Joint Venture Partner) as the case may be in the types and proportions of currencies in which the Contract Price is payable, in addition to normal performance bank guarantee to be submitted by the Contractor to the Employer besides entering into a separate Agreement (in the requisite format included in Bid Document).

The Contractor within one hundred twenty (120) days of issue of Letter of Acceptance shall provide an additional security for Manufacturer's performance from his Manufacturer, on whose basis qualifying requirements have been met, if required, under the Contract. The Performance Security shall be in the form of a bank guarantee, as stipulated by the Employer in the Bidding Documents. The Performance Security shall be denominated in the types and proportions of currencies in which the Contract Price is payable. The performance bank guarantee for the amounts expressed in Nepalese Rupees shall be issued by any "A" class Bank in Nepal. The Bank Guarantees in INR shall be acceptable only if these are issued by a Scheduled Bank of India duly counter guaranteed by any A class Bank in Nepal.

The additional performance bank guarantee provided by parent company and/or Manufacturer shall be valid till completion of the part of the Facilities executed by the Manufacturer.

14. Taxes and Duties

14.1 The Contractor shall bear and pay all taxes, duties, levies and charges assessed on the Contractor, its Subcontractors or their employees by all municipal, state or national government authorities in connection with the Facilities in and outside of the country where the Site is located.

The quoted bid price (both Supply and Service portion) shall include all duties, taxes etc. The details of loading of Taxes in the bid shall be provided under Data Sheet, to adjust the Change in Laws and regulations regarding taxes if required in future.

14.2 Deleted without change in serial no.

14.3 If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the country where the Site is located, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.

14.4 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies and charges prevailing at the date twenty-eight (28) days prior to the date of bid submission in the country where the Site is located (hereinafter called "Tax" in this GC Sub-Clause 14.4). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction therefrom, as the case may be, in accordance with GC Clause 36 hereof.

Intellectual Property

15. License/Use of Technical Information

15.1 For the operation and maintenance of the Plant, the Contractor hereby grants a non-exclusive and non-transferable license (without the right to sub-license) to the Employer under the patents, utility models or other industrial property rights owned by the Contractor or by a third Party from whom the Contractor has received the right to grant licenses thereunder, and shall also grant to the Employer a non-exclusive and non-transferable right (without the right to sub-license) to use the know-how and other technical information disclosed to the Employer under the Contract. Nothing contained herein shall be construed as transferring ownership of any patent, utility model, trademark, design, copyright, know-how or other intellectual

property right from the Contractor or any third Party to the Employer.

15.2 The copyright in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third Party, including suppliers of materials, the copyright in such materials shall remain vested in such third Party.

16. Confidential Information

16.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other Party hereto, divulge to any third Party any documents, data or other information furnished directly or indirectly by the other Party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GC Clause 16.

16.2 The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the design, procurement of Plant, construction or such other work and services as are required for the performance of the Contract.

16.3 The obligation of a Party under GC Sub-Clauses 16.1 and 16.2 above, however, shall not apply to that information which

(a) now or hereafter enters the public domain

through no fault of that Party

- (b) can be proven to have been possessed by that Party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other Party hereto
- (c) otherwise lawfully becomes available to that Party from a third Party that has no obligation of confidentiality.

16.4 The above provisions of this GC Clause 16 shall not in any way modify any undertaking of confidentiality given by either of the Parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

16.5 The provisions of this GC Clause 16 shall survive termination, for whatever reason, of the Contract.

Execution of the Facilities

17. Representatives 17.1 EIC

If the EIC is not named in the Contract, then within fourteen (14) days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the EIC. The Employer may from time to time appoint some other person as the EIC in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the Facilities. Such appointment shall only take effect upon receipt of such notice by the Contractor. The EIC shall represent and act for the Employer at all times during the performance of the Contract. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the EIC, except as herein otherwise provided.

All notices, instructions, information and other communications given by the Contractor to the Employer under the Contract shall be given to the EIC, except as herein otherwise provided.

17.2 Contractor's Representative & Construction

Manager

17.2.1 If the Contractor's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefor, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GC Sub-Clause 17.2.1 shall apply thereto.

17.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the performance of the Contract and shall give to the EIC all the Contractor's notices, instructions, information and all other communications under the Contract.

All notices, instructions, information and all other communications given by the Employer or the EIC to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.

The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GC Sub-Clause 17.2.1.

17.2.3 The Contractor's Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her.

Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the EIC.

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GC Sub-Clause 17.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.

17.2.4 From the commencement of installation of the Facilities at the Site until Completion, the Contractor's Representative shall appoint a suitable person as the Construction Manager. The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site throughout normal working hours except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as the Construction Manager's deputy.

17.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GC Sub-Clause 22.3. The Contractor shall remove such person from the Facilities upon such instructions being given by the Employer. 17.2.6 If any representative or person employed by the Contractor is removed in accordance with GC Sub-Clause 17.2.5, the Contractor shall, where required, promptly appoint a replacement.

18. Work Program 18.1 Contractor's Organization

The Contractor shall supply to the Employer and the EIC a chart showing the proposed organization to be established by the Contractor for carrying

out work on the Facilities within twenty-one (21) days of the Effective Date. The chart shall include the identities of the key personnel and the curricula vitae of such key personnel to be employed shall be supplied together with the chart. The Contractor shall promptly inform the Employer and the EIC in writing of any revision or alteration of such an organization chart.

18.2 Program of Performance

Within twenty-eight (28) days after the Effective Date, the Contractor shall submit to the EIC a detailed program of performance of the Contract, made in a form acceptable to the EIC and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and pre-commission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion, Commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in the Appendix to the Contract Agreement titled Time Schedule, and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the EIC, but without modification in the Times for Completion and any extension granted in accordance with GC Clause 40, and shall submit all such revisions to the EIC.

18.3 Progress Report

The Contractor shall monitor progress of all the activities specified in the program referred to in GC Sub-Clause 18.2 above, and supply a progress report to the EIC before the 7th day of each calendar month.

The progress report shall be in a form acceptable to the EIC and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving

comments and likely consequences and stating the corrective action being taken.

18.4 Progress of Performance

If at any time the Contractor's actual progress falls behind the program referred to in GC Sub-Clause 18.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the EIC, prepare and submit to the EIC a revised program, taking into account the prevailing circumstances, and shall notify the EIC of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GC Sub-Clause 8.2, any extension thereof entitled under GC Sub-Clause 40.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

18.5 Procedures

The Contract shall be executed in accordance with the Contract Documents including the procedures given in the Forms and Procedures of the Employer's Requirements.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

19.Subcontracting

19.1 The Appendix to the Contract Agreement titled List of suppliers for Major Items of Plant Installation Services specifies major items of supply or services along with list of Subcontractors/manufacturers.

19.2 The Contractor shall select and employ its Subcontractors/manufacturers for such major items from those listed in the lists referred to in GC Sub-Clause 19.1.

19.3 For Make/supplier not specified in the Appendix-5, the Contractor may employ such Subcontractors/manufacturers in following manner: -

The bidder may propose Make/supplier for major/minor

items of Plant, installation services in the technical bid alongwith credentials, the same may be considered with the approval of Employer. ,. Post award stage additional manufacturer(s) will be added with justification by the Contractor with the approval of Employer.

19.4 Each sub-contract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GC 19.5 (if and when applicable), or in event of termination by the Employer under GC 42.2.

19.5 If a sub-contractor's obligations extend beyond the expiry date of the relevant Defects Liability Period and the EIC, prior to that date, instructs the Contractor to assign the benefits of such obligations to the Employer, then the Contractor shall do so.

20. Design and Engineering

20.1 Specifications and Drawings

20.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice.

The Contractor shall be responsible for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications, drawings and other documents have been approved by the EIC or not, provided that such discrepancies, errors or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

20.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the EIC.

20.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the

Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GC Clause 39.

20.3 Review/Approval of Technical Documents by EIC

20.3.1 The Contractor shall prepare or cause its Subcontractors to prepare, and furnish to the EIC the documents listed in the Appendix to the Contract Agreement titled List of Documents for review, as specified and in accordance with the requirements of GC Sub-Clause 18.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be reviewed by the EIC shall be executed only after the EIC's review thereof.

GC Sub-Clauses 20.3.2 through 20.3.7 shall apply to those documents requiring the EIC's review.

20.3.2 Within thirty (30) days after receipt by the EIC of any document requiring the EIC's approval in accordance with GC Sub-Clause 20.3.1, the EIC shall either return one copy thereof to the Contractor with its views endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the EIC proposes.

Should the Employer not give its comments within the said period of thirty (30) days, Contractor shall serve notice on the Employer to this effect and the Employer shall give its comments within seven (07) days from receipt of such notice. In case such approval/comment is not communicated within seven (07) days, submittals of the Contractor shall be deemed to have been approved.

20.3.3 The EIC shall not disapprove any

document, except on the grounds that the document does not comply with the Contract or that it is contrary to good engineering practice.

20.3.4 If the EIC disapproves the document, the Contractor shall modify the document and resubmit it for the EIC's approval in accordance with GC Sub-Clause 20.3.2. If the EIC approves the document subject to modification(s), the Contractor shall make the required modification(s), whereupon the document shall be deemed to have been approved.

20.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the EIC of any document and/or any modification(s) thereto that cannot be settled between the Parties within a reasonable period, then such dispute or difference may be referred to Adjudicator in accordance with GC Sub-Clause 46.1 hereof. If such dispute or difference is referred to Adjudicator, the EIC shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the EIC's instructions, provided that if the Adjudicator upholds the Contractor's view on the dispute and if the Employer has not given notice under GC Sub-Clause 46.3 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Adjudicator shall decide, and the Time for Completion shall be extended accordingly.

20.3.6 The EIC's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the

Contract.

20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the EIC an amended document and obtained the EIC's approval thereof, pursuant to the provisions of this GC Sub-Clause 20.3.

If the EIC requests any change in any already approved document and/or in any document based thereon, the provisions of GC Clause 39 shall apply to such request.

21. Procurement

21.1 Plant

Subject to GC Sub-Clause 14.2, the Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.

21.2 Employer-Supplied Plant

If the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, provides that the Employer shall furnish any specific items to the Contractor, the following provisions shall apply:

21.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the Parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to GC Sub-Clause 18.2, unless otherwise mutually agreed.

21.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the EIC of any detected shortage, defect or default. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this GC Sub-Clause 21.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item,

or shall apply to defective items that have been repaired.

21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GC Clause 27 or under any other provision of Contract.

21.3 Transportation

21.3.1 The Contractor shall at its own risk and expense transport all the materials and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

21.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the materials and the Contractor's Equipment.

21.3.3 Upon dispatch of each shipment of materials and the Contractor's Equipment, the Contractor shall notify the Employer by facsimile or electronic means, of the description of the materials and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the Parties.

21.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the materials and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for

damage to roads, bridges or any other traffic facilities that may be caused by the transport of the materials and the Contractor's Equipment to the Site.

21.4 Customs Clearance

The Contractor shall, at its own expense, handle all imported materials and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer's obligations under GC Sub-Clause 14.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance that are not the fault of the Contractor, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to GC Clause 40.

22. Installation

22.1 Setting Out/Supervision

22.1.1 Bench Mark: The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks and lines provided to it in writing by or on behalf of the Employer.

If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level or alignment of the Facilities, the Contractor shall forthwith notify the EIC of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the EIC. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

22.1.2 Contractor's Supervision: The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the

installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

22.2 Labour:

22.2.1 Engagement of Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding and transport.

The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.

The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site into the country where the Site is located. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel.

The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means

of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

22.2.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Employer's Personnel.

22.2.3 Labour Laws

During continuance of the Contract, the Contractor and his sub-contractor(s) shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority of the country where the Site is located. The Contractor shall also comply with the Laws relating to their employment, health, safety, welfare, immigration, and shall allow them all their legal rights of the country where the Site is located. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention by the Contractor of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/acts/rules/regulations including amendments, if any, on the part of the Contractor, the Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The employees of the Contractor and his sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

Salient features of some of the major labour laws that are applicable to construction industry are given below.

Applicable laws of Nepal :

- a. The Labour Act, 2017 (2074)
- b. Human Right Commission Act, 1997 (2053)
- c. Contract Act, 2000 (2056)
- d. Trade Union Act (2049)
- e. Labour and employment policy (2062)
- f. Beema Act (2049)
- g. Bonus Act (2030)
- h. Labour Regulation, 2050

The compliance of all the above mentioned Acts shall be read alongwith the latest amendments of the respective Acts and the new Acts also.

The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.

Provided always that the Contractor shall have no right to demand payments/claims whatsoever on account of his compliance with his obligations under this clause and Labour Regulation.

The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.

The Contractor shall, in all dealings with its labour and the labour of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor.

22.2.4 Rates of Wages and Conditions of Labor

The Contractor shall pay rates of wages, and

observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

22.2.5 Working Hours

Subject to any provision to the contrary contained in the Contract, the Contractor shall have the option to work continuously by day and by night and on locally recognized holidays or days of rest, without any additional cost to the Employer.

22.2.6 Facilities for Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

22.2.7 Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health

and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send to the EIC, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the EIC may reasonably require.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's employees, all Sub-Contractors and Employer's and EIC's employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD)—or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labor as

appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labor.

The Contractor shall include in the program to be submitted for the execution of the Facilities under Sub-Clause 18.2 an alleviation program for Site staff and labor and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related sub-contracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation.

22.2.8 Funeral Arrangements

In the event of the death of any of the Contractor's personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial.

22.2.9 Records of Contractor's Personnel

The Contractor shall keep accurate records of the Contractor's personnel, including the number of each class of Contractor's Personnel on the Site and the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis in a form approved by the EIC and shall be available for inspection by the EIC until the Contractor has completed all work.

22.2.10 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at

reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

22.2.11 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

22.2.12 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

22.2.13 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift barter or disposal by Contractor's Personnel.

22.2.14 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

22.2.15 Prohibition of All Forms of Forced or Compulsory Labor

The contractor shall not employ "forced or compulsory labor" in any form. "Forced or compulsory labor" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

22.2.16 Prohibition of Harmful Child Labor

The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

22.3 Contractor's Equipment

22.3.1 All Contractor's Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the EIC's consent that such Contractor's Equipment is no longer required for the execution of the Contract.

22.3.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

22.3.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

22.4 Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the EIC, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical

care, and fire prevention.

22.5 Opportunities for Other Contractors

22.5.1 The Contractor shall, upon written request from the Employer or the EIC, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.

22.5.2 If the Contractor, upon written request from the Employer or the EIC, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

22.5.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The EIC shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.

22.5.4 The Contractor shall notify the EIC promptly of any defects in the other contractors' work that come to its notice, and that could affect the Contractor's work. The EIC shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the EIC shall be binding on the Contractor.

22.6 Emergency Work

If, by reason of an emergency arising in connection with and during the execution of the

Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.

22.7 Site Clearance

22.7.1 Site Clearance in Course of Performance:

In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

22.7.2 Clearance of Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities in a clean and safe condition.

22.8 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

23. Test and Inspection

23.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and any part of the Facilities as are specified in the Contract.

23.2 The Employer and the EIC or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

23.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give at least twenty-one (21) days period advance notice of such test and/or inspection and of the place and time thereof to the EIC. The Contractor shall obtain from any relevant third Party or manufacturer any necessary permission or consent to enable the Employer and the EIC or their designated representatives to attend the test and/or inspection.

23.4 The Contractor shall provide the EIC with a certified report of the results of any such test and/or inspection.

If the Employer or EIC or their designated representatives fails to attend the test and/or inspection, or if it is agreed between the Parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the EIC with a certified report of the results thereof.

23.5 The EIC may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impede the progress of work on the Facilities and/or the Contractor's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for

Completion and the other obligations so affected.

23.6 If any Plant or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GC Sub-Clause 23.3.

23.7 If any dispute or difference of opinion shall arise between the Parties in connection with or arising out of the test and/or inspection of the Plant or part of the Facilities that cannot be settled between the Parties within a reasonable period of time, it may be referred to an Adjudicator for determination in accordance with GC Sub-Clause 46.1.

23.8 The Contractor shall afford the Employer and the EIC, at the Employer's expense, access at any reasonable time to any place where the Plant are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the EIC shall give the Contractor a reasonable prior notice.

23.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant or any part of the Facilities, nor the attendance by the Employer or the EIC, nor the issue of any test certificate pursuant to GC Sub-Clause 23.4, shall release the Contractor from any other responsibilities under the Contract.

23.10 No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the EIC whenever any such parts of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.

23.11 The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the EIC may from time to time require at the Site, and shall reinstate and

make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GC Sub-Clause 23.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

24. Completion of the Facilities

24.1 As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Employer's Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.

24.2 Within seven (7) days after receipt of the notice from the Contractor under GC Sub-Clause 24.1, the Employer shall supply the operating and maintenance personnel specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer for supervising the Pre-commissioning of the Facilities or any part thereof.

24.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer for supervision, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GC Sub-Clause 25.5.

24.4 As soon as all works in respect of Pre-commissioning are completed and, in the opinion of the Contractor, the Facilities or any part thereof is ready for Commissioning, the Contractor shall so notify the EIC in writing.

24.5 The EIC shall, within fourteen (14) days after receipt of the Contractor's notice under GC Sub-

Clause 24.4, either issue a Completion Certificate in the form specified in the Employer's Requirements (Forms and Procedures), stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's notice under GC Sub-Clause 24.4, or notify the Contractor in writing of any defects and/or deficiencies.

If the EIC notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GC Sub-Clause 24.4.

If the EIC is satisfied that the Facilities or that part thereof have reached Completion, the EIC shall, within seven (7) days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's repeated notice.

If the EIC is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

24.6 If the EIC fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor's repeated notice under GC Sub-Clause 24.5, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be.

24.7 As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any

monies owing to the Contractor.

24.8 Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

**25. Commissioning
and Operational
Acceptance**

25.1 Commissioning

25.1.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the EIC, pursuant to GC Sub-Clause 24.5, or immediately after the date of the deemed Completion, under GC Sub-Clause 24.6.

25.1.1 DELETED.

25.1.3 In accordance with the requirements of the Contract, the Contractor's and EIC's advisory personnel shall attend the Commissioning, including the Guarantee Test, and shall advise and assist the Employer.

25.2 Guarantee Test

25.2.1 Subject to GC Sub-Clause 25.5, the Guarantee Test and repeats thereof shall be conducted by the Contractor during Commissioning of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test and any repeats thereof.

25.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof could not be successfully completed within 30 days from the date of Completion or any other period agreed upon by the Employer and the

Contractor, the Contractor shall serve notice on the Employer to this effect and in case no communication is received from the Employer within 15 days of receipt of such notice from Contractor in this regard, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GC Sub-Clauses 28.2 and 28.3 shall not apply.

25.3 Operational Acceptance

25.3.1 Subject to GC Sub-Clause 25.4 below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

- (a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or
- (b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion pursuant to GC Sub-Clause 25.2.2 above or any other period agreed upon by the Employer and the Contractor; or
- (c) the Contractor has paid the liquidated damages specified in GC Sub-Clause 28.3 hereof; and
- (d) any minor items mentioned in GC Sub-Clause 24.7 hereof relevant to the Facilities or that part thereof have been completed.

25.3.2 At any time after any of the events set out in GC Sub-Clause 25.3.1 have occurred, the Contractor may give a notice to the EIC requesting the issue of an Operational Acceptance Certificate in the form provided in the Employer's Requirements (Forms and Procedures) in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

25.3.3 The EIC shall, after consultation with the Employer, and within twenty one (21) days after receipt of the Contractor's notice, issue

an Operational Acceptance Certificate.

25.3.4 If within twenty one (21) days after receipt of the Contractor's notice, the EIC fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the EIC has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as of the date of the Contractor's said notice.

25.4 Partial Acceptance

25.4.1 If the Contract specifies that Completion and Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.

25.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the EIC shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

25.5 Delayed Pre-commissioning and/or Guarantee Test

25.5.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 24.3, or with the Guarantee Test pursuant to Sub-Clause 25.2, for reasons attributable to the Employer either on account of non availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Contractor's control, the provisions leading to "deemed" completion of activities such as Completion, pursuant to

GC Sub-Clause 24.6, and Operational Acceptance, pursuant to GC Sub-Clause 25.3.4, and Contractor's obligations regarding Defect Liability Period, pursuant to GC Sub-Clause 27.2, Functional Guarantee, pursuant to GC Clause 28, and Care of Facilities, pursuant to GC Clause 32, and GC Clause 41.1, Suspension, shall not apply. In this case, the following provisions shall apply.

25.5.2 When the Contractor is notified by the EIC that he will be unable to proceed with the activities and obligations pursuant to above Sub-Clause 13.1, the Contractor shall be entitled to the following:

- (a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GC Sub-Clause 26.2;
- (b) payments due to the Contractor in accordance with the provision specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which would not have been payable in normal circumstances due to non-completion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding those payments, subject to the provision of Sub-Clause 25.5.3 below;
- (c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer;
- (d) the additional charges towards the care of the Facilities pursuant to GC Sub-

Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause 25.5.4 below. The provision of GC Sub-Clause 33.2 shall apply to the Facilities during the same period.

25.5.3 In the event that the period of suspension under above Sub-Clause 25.5.1 actually exceeds one hundred eighty (180) days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor.

25.5.4 When the Contractor is notified by the EIC that the plant is ready for Pre-commissioning, the Contractor shall proceed without delay in performing Pre-commissioning in accordance with Clause 24.

Guarantees and Liabilities

26. Completion Time Guarantee

26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the Contract pursuant to GC Sub-Clause 8.2, or within such extended time to which the Contractor shall be entitled under GC Clause 40 hereof.

26.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount **computed @ 0.05% of the Contract Price per day of delay per milestone**. The aggregate amount of such liquidated damages shall in no event exceed ten percent (10%) of the Contract Price.

Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GC Clause 40. The Contractor shall have no further liability whatsoever to the Employer in

respect thereof.

However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.

Save for liquidated damages payable under this GC Sub-Clause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the Appendix to the Contract Agreement titled Time Schedule, and/or other program of work prepared pursuant to GC Sub-Clause 18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.

26.3 No bonus shall be payable to the Contractor for any Completion of the Facilities or part thereof before the time prescribed.

27. Defect Liability 27.1 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant supplied and of the work executed.

27.2 The Defect Liability Period shall be four hundred twenty five (425) days from the date of Completion of the Facilities (or any part thereof) or one year from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, pursuant to GC Sub-Clause 27.10.

If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good as the Contractor shall determine at its discretion, such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

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- (a) improper operation or maintenance of the Facilities by the Employer;
 - (b) operation of the Facilities outside specifications provided in the Contract; or
 - (c) normal wear and tear.

27.3 The Contractor's obligations under this GC Clause 27 shall not apply to:

- (a) any materials that are supplied by the Employer under GC Sub-Clause 21.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein;
- (b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein; or
- (c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GC Sub-Clause 27.7.

27.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GC Clause 27.

The Contractor may, with the consent of the Employer, remove from the Site any Plant or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

27.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer

may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good, as the case may be, until that part of the Facilities passes such tests. The standard of such tests shall in no case be less than those for the original Equipment/ part of the Facilities.

27.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be appropriated by the Employer from any monies due to the Contractor or claimed under the Performance Security.

27.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

27.9 Except as provided in GC Clauses 27 and 33, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant, design or engineering or work executed that appear after Completion of the Facilities or any part thereof, except where such defects are the result of the gross negligence, fraud, or criminal or willful action of the Contractor.

27.10 In addition, any such component of the Facilities, and during the period of time, shall be subject to an extended defect liability period. Such obligation

of the Contractor shall be in addition to the defect liability period specified under GC Sub-Clause 27.2.

28. Functional Guarantees

28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, subject to and upon the conditions therein specified.

28.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract, pursuant to GC Sub-Clause 42.2.2.

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in the said Appendix to the Contract Agreement is met, the Contractor shall, at the Contractor's option, either

- a) make such changes, modifications and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense, and shall request the Employer to repeat the Guarantee Test or
- b) Failure to attain the Functional Guarantees, the employer shall have option to accept it after recovering the losses arising out of aforesaid non compliance.

29. Patent Indemnity

29.1 The Contractor shall, subject to the Employer's compliance with GC Sub-Clause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.

29.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in

conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

29.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Employer.

30. Limitation of Liability

30.1 Except in cases of criminal negligence or willful misconduct,

- (a) neither Party shall be liable to the other Party, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, which may be suffered by the other Party in connection with the Contract, other than specifically provided as any obligation of the Party in the Contract, and
- (b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

Risk Distribution

31. Transfer of Ownership

31.1 Ownership of the Plant (including spare parts) to be imported into the country where the Site is located shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Plant from the country of origin to that country and upon endorsement of the dispatch

documents in favour of the Employer.

31.2 Ownership of the Plant (including spare parts) procured in the country where the Site is located shall be transferred to the Employer upon loading on to the mode of transport to be used to carry the Plant and Equipment from the works to the site and upon endorsement of the dispatch documents in favour of the Employer.

31.3 Ownership of the Contractor's Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.

31.4 Ownership of any Plant in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant in question are no longer required for the Facilities.

31.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant are incorporated.

32. Care of Facilities

32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of issuance of Operational Acceptance Certificate pursuant to GC Clause 25, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GC Clause 27. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GC Sub-Clauses 32.2 and 38.1.

32.2 If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary

facilities by reason of

- (a) insofar as they relate to the country where the Site is located, nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks, taken out under GC Clause 34 hereof; or
- (b) any use or occupation by the Employer or any third Party other than a Subcontractor, authorized by the Employer of any part of the Facilities; or
- (c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer,

The Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GC Clause 39. If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GC Clause 39, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GC Sub-Clause 42.1 hereof.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended

to be used for purposes of the Facilities, except (i) as mentioned in GC Sub-Clause 32.2 with respect to the Contractor's temporary facilities, and (ii) where such loss or damage arises by reason of any of the matters specified in GC Sub-Clauses 32.2 (b) and (c) and 38.1.

32.4 With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor's Equipment by reason of any of the matters specified in GC Sub-Clause 38.1, the provisions of GC Sub-Clause 38.3 shall apply.

**33. Loss of or
Damage to
Property; Accident
or Injury to
Workers;
Indemnification**

33.1 Subject to GC Sub-Clause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property other than the Facilities whether accepted or not, arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GC Sub-Clause 33.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under GC Clause 34, provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.

33.4 The Party entitled to the benefit of an indemnity under this GC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the Party fails to take such measures, the other Party's liabilities shall be correspondingly reduced.

34. Insurance

34.1 To the extent specified in the Appendix 3 to the Contract Agreement titled Insurance Requirements, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix 3. Contractor shall have option either to have a single comprehensive insurance in one cover or separate insurances. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval. The insurance under this Contract shall be effected with Government / Public Sector insurance companies of Nepalese or Indian origin only.

(a) Cargo Insurance During Transport

Covering loss or damage occurring while in transit from the Contractor's or Subcontractor's works or stores until arrival at the Site, to the Plant (including spare parts therefor) and to the Contractor's Equipment.

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third Parties including the Employer's personnel, and loss of or damage to property occurring in connection with the supply and installation of the Facilities.

34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Third Party Liability and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1 except for the Cargo Insurance During Transport, and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insurers for losses or claims arising out of the performance of the Contract shall be waived under such policies.

34.3 The Contractor shall, in accordance with the provisions of the Appendix to the Contract Agreement titled Insurance Requirements, deliver to the Employer certificates of insurance or copies of the insurance policies as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days' notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy.

34.4 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the

Contractor.

34.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the Appendix to the Contract Agreement titled Insurance Requirements, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insurers under all such policies. All insurers' rights of subrogation against such co-insurers for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GC Sub-Clause 34.5.

34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GC Sub-Clause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GC 34.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer, and the Contractor shall have full recourse against the Employer for any and all liabilities of the

Employer herein.

34.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GC Clause 34, and all monies payable by any insurers shall be paid to the Contractor. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.

**35. Unforeseen
Conditions**

35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions other than climatic conditions, or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities including any data as to boring tests, provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site if access thereto was available, or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant or Contractor's Equipment, notify the EIC in writing of

- (a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen;

- (b) the additional work and/or Plant and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions;
- (c) the extent of the anticipated delay; and
- (d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this GC Sub-Clause 35.1, the EIC shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the EIC shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the EIC to overcome such physical conditions or artificial obstructions referred to in GC Sub-Clause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in GC Sub-Clause 35.1, the Time for Completion shall be extended in accordance with GC Clause 40.

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- 36. Change in Laws and Regulations** 36.1 If, after the date twenty-eight (28) days prior to the date of Bid submission, in the country where the Site is located, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed which shall be deemed to include any change in interpretation or application by the competent authorities, that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, pursuant to GC Sub-Clause 11.2.
- 37. Force Majeure** 37.1 "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the Party affected, and shall include, without limitation, the following:
- (a) war, hostilities or warlike operations whether a state of war be declared or not, invasion, act of foreign enemy and civil war
 - (b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts
 - (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority
 - (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply,

epidemics, quarantine and plague

- (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster
- (f) shortage of labor, materials or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either Party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

37.3 The Party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such Party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GC Clause 40.

37.4 The Party or Parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either Party's right to terminate the Contract under GC Sub-Clauses 37.6 and 38.5.

37.5 No delay or nonperformance by either Party hereto caused by the occurrence of any event of Force Majeure shall

- (a) constitute a default or breach of the Contract, or
- (b) give rise to any claim for damages or additional cost or expense occasioned thereby, subject to GC Sub-Clauses 32.2, 38.3 and 38.4

if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

37.6 If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the currency of the Contract, the Parties will attempt to develop a mutually satisfactory solution, failing which either Party may terminate the Contract by giving a notice to the other, but without prejudice to either Party's right to terminate the Contract under GC Sub-Clause 38.5.

37.7 In the event of termination pursuant to GC Sub-Clause 37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GC Sub-Clauses 42.1.2 and 42.1.3.

37.8 Notwithstanding GC Sub-Clause 37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.

38. War Risks

38.1 "War Risks" shall mean any event specified in paragraphs (a) and (b) of GC Sub-Clause 37.1 and any explosion or impact of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, occurring or existing in or near the country (or countries) where the Site is located.

38.2 Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to

- (a) destruction of or damage to Facilities, Plant, or any part thereof;
- (b) destruction of or damage to property of the Employer or any third Party; or
- (c) injury or loss of life

if such destruction, damage, injury or loss of life is caused by any War Risks, and the Employer shall indemnify and hold the Contractor harmless from

and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges or expenses arising in consequence of or in connection with the same.

38.3 If the Facilities or any Plant or Contractor's Equipment or any other property of the Contractor used or intended to be used for the purposes of the Facilities shall sustain destruction or damage by reason of any War Risks, the Employer shall pay the Contractor for

(a) any part of the Facilities or the Plant so destroyed or damaged to the extent not already paid for by the Employer

and so far as may be required by the Employer, and as may be necessary for completion of the Facilities

(b) replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged

(c) replacing or making good any such destruction or damage to the Facilities or the Plant or any part thereof.

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with GC Clause 39, excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to GC Sub-Clause 42.1.

If the Employer requires the Contractor to replace or make good on any such destruction or damage to the Facilities, the Time for Completion shall be extended in accordance with GC 40.

38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract that are in any way attributable to, consequent on, resulting from, or in any way connected with any War Risks, provided that the Contractor shall as soon as practicable notify the

Employer in writing of any such increased cost.

38.5 If during the performance of the Contract any War Risks shall occur that financially or otherwise materially affect the execution of the Contract by the Contractor, the Contractor shall use its reasonable efforts to execute the Contract with due and proper consideration given to the safety of its and its Subcontractors' personnel engaged in the work on the Facilities, provided, however, that if the execution of the work on the Facilities becomes impossible or is substantially prevented for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of any War Risks, the Parties will attempt to develop a mutually satisfactory solution, failing which either Party may terminate the Contract by giving a notice to the other.

38.6 In the event of termination pursuant to GC Sub-Clauses 38.3 or 38.5, the rights and obligations of the Employer and the Contractor shall be specified in GC Sub-Clauses 42.1.2 and 42.1.3.

Change in Contract Elements

39. Change in the Facilities

39.1 Introducing a Change

39.1.1 Subject to GC Sub-Clauses 39.2.5 and 39.2.7, the Employer shall have the right to propose, and subsequently require, that the EIC order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities hereinafter called "Change", provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.

39.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer with a copy to the EIC, any Change that the Contractor considers

necessary or desirable to improve the quality, efficiency or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.

39.1.3 Notwithstanding GC Sub-Clauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.

39.1.4 The procedure on how to proceed with and execute Changes is specified in GC Sub-Clauses 39.2 and 39.3, and further details and forms are provided in the Employer's Requirements (Forms and Procedures).

39.2 Changes Originating from Employer

39.2.1 If the Employer proposes a Change pursuant to GC Sub-Clause 39.1.1, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the EIC as soon as reasonably practicable a "Change Proposal," which shall include the following:

- (a) brief description of the Change
- (b) effect on the Time for Completion
- (c) estimated cost of the Change
- (d) effect on Functional Guarantees (if any)
- (e) effect on the Facilities
- (f) effect on any other provisions of the Contract.

39.2.2 Prior to preparing and submitting the "Change Proposal," the Contractor shall submit to the EIC an "Estimate for Change Proposal," which shall be an estimate of the cost of preparing and submitting the Change Proposal.

Upon receipt of the Contractor's Estimate for

Change Proposal, the Employer shall do one of the following:

- (a) accept the Contractor's estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal
- (b) advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate
- (c) advise the Contractor that the Employer does not intend to proceed with the Change.

39.2.3 Upon receipt of the Employer's instruction to proceed under GC Sub-Clause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GC Sub-Clause 39.2.1.

39.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the Parties thereto shall agree on specific rates for the valuation of the Change.

39.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GC Clause 39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Contract Agreement by more than fifteen percent (15%), the Contractor may give a written notice of objection thereto prior to furnishing the Change Proposal as aforesaid. If the Employer accepts the Contractor's objection, the Employer shall withdraw the proposed Change and shall notify the Contractor in writing thereof.

The Contractor's failure to so object shall neither affect its right to object to any

subsequent requested Changes or Change Orders herein, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Contractor represents.

39.2.6 Upon receipt of the Change Proposal, the Employer and the Contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.

If the Employer is unable to reach a decision within fourteen (14) days, it shall notify the Contractor with details of when the Contractor can expect a decision.

If the Employer decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Contractor accordingly. Under such circumstances, the Contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Contractor in its Estimate for Change Proposal submitted in accordance with GC Sub-Clause 39.2.2.

39.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order."

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The Parties shall thereafter attempt to reach agreement on the outstanding issues under the Change

Proposal.

If the Parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to Adjudicator in accordance with the provisions of GC Sub-Clause 46.1.

39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to GC Sub-Clause 39.1.2, the Contractor shall submit to the EIC a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in GC Sub-Clause 39.2.1.

Upon receipt of the Application for Change Proposal, the Parties shall follow the procedures outlined in GC Sub-Clauses 39.2.6 and 39.2.7. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.

40. Extension of Time for Completion

40.1 The Time(s) for Completion specified pursuant to GC Sub-Clause 8.2 shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) any Change in the Facilities as provided in GC Clause 39
- (b) any occurrence of Force Majeure as provided in GC Clause 37, unforeseen conditions as provided in GC Clause 35, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GC Sub-Clause 32.2
- (c) any suspension order given by the Employer under GC Clause 41 hereof or reduction in the rate of progress pursuant to GC Sub-Clause 41.2 or
- (d) any changes in laws and regulations as

provided in GC Clause 36 or

- (e) any default or breach of the Contract by the Employer, Appendix to the Contract Agreement titled ,or any activity, act or omission of the Employer, or the EIC, or any other contractors employed by the Employer, or
- (f) any delay on the part of a sub-contractor, provided such delay is due to a cause for which the Contractor himself would have been entitled to an extension of time under this sub-clause, or
- (g) delays attributable to the Employer or caused by customs, or
- (h) any other matter specifically mentioned in the Contract

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the EIC a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer's estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter to Adjudicator, pursuant to GC Sub-Clause 46.1.

The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract. In all cases where the Contractor has given a notice of a claim for an extension of time under GC 40.2, the Contractor shall consult with the EIC in order to determine the steps (if any) which can be taken to overcome or minimize the actual or anticipated delay. The Contractor shall there after comply with

all reasonable instructions which the EIC shall give in order to minimize such delay. If compliance with such instructions shall cause the Contractor to incur extra costs and the Contractor is entitled to an extension of time under GC 40.1, the amount of such extra costs shall be added to the Contract Price. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delays due to such failures shall not be considered in assessing the time extension

In the event of extension of Time for Completion granted pursuant to GC 40.1 (c) and (e) under the Contract, the Contractor shall be entitled of cost towards idling of Contractor's resources as per the **Appendix-9: Valuation of Idling Time cost claims**

41. **Suspension** 41.1 The Employer may request the EIC, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons therefor. The Contractor shall thereupon suspend performance of such obligation, except those obligations necessary for the care or preservation of the Facilities, until ordered in writing to resume such performance by the EIC.

If, by virtue of a suspension order given by the EIC, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the EIC requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GC Clause 39, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the EIC, elect to treat the suspension, where it affects a

part only of the Facilities, as a deletion of such part in accordance with GC Clause 39 or, where it affects the whole of the Facilities, as termination of the Contract under GC Sub-Clause 42.1.

41.2 If

(a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, or fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice or

(b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas in accordance with GC Sub-Clause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may by fourteen (14) days' notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this GC Clause 41, then the Time for

Completion shall be extended in accordance with GC Sub-Clause 40.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.

41.4 During the period of suspension, the Contractor shall not remove from the Site any Plant, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.

42. Termination

42.1 Termination for Employer's Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GC Sub-Clause 42.1.

42.1.2 Upon receipt of the notice of termination under GC Sub-Clause 42.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below
- (c) remove all Contractor's Equipment from the Site, repatriate the Contractor's and its Subcontractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition, and
- (d) subject to the payment specified in GC

Sub-Clause 42.1.3,

- (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
- (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors; and
- (iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities.

42.1.3 In the event of termination of the Contract under GC Sub-Clause 42.1.1, the Employer shall pay to the Contractor the following amounts:

- (a) the Contract Price, proportionately attributable to the parts of the Facilities executed by the Contractor as of the date of termination
- (b) the costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel
- (c) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges
- (d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GC Sub-

Clause 42.1.2

- (e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third Parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

42.2 Termination for Contractor's Default

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this GC Sub-Clause 42.2:

- (a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up, other than a voluntary liquidation for the purposes of amalgamation or reconstruction, a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt
- (b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GC Clause 43.
- (c) if the Contractor, in the judgment of the Employer has engaged in corrupt, collusive, coercive, or fraudulent practices, as defined in GC Clause 6, in competing for or in executing the Contract.

42.2.2 If the Contractor

- (a) has abandoned or repudiated the Contract
- (b) has without valid reason failed to

commence work on the Facilities promptly or has suspended, other than pursuant to GC Sub-Clause 41.2, the progress of Contract performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed

- (c) persistently fails to execute the Contract in accordance with the Contract or neglects to carry out its obligations under the Contract without just cause
- (d) refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the program furnished under GC Sub-Clause 18.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended,

then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GC Sub-Clause 42.2.

42.2.3 Upon receipt of the notice of termination under GC Sub-Clauses 42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe

condition

- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below
- (c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
- (d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors
- (e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

42.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third Party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer's use of such equipment, any Contractor's Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site and shall return such

Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

42.2.5 Subject to GC Sub-Clause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GC Sub-Clause 42.2.3. Any sums due the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities shall be determined by the Employer.

If the sum that the Contractor is entitled to be paid, pursuant to GC Sub-Clause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GC Sub-Clause 42.2.5, the Contractor shall pay the balance to the Employer.

42.3 Termination by the Contractor

42.3.1 If

- (a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment, or commits a substantial breach of the Contract, the Contractor may give a notice to the

Employer that requires payment of such sum, with interest thereon as stipulated in GC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice, or

- (b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this GC Sub-Clause 42.3.1, forthwith terminate the Contract.

42.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this GC Sub-Clause 42.3.2, if the Employer becomes bankrupt or insolvent, has a receiving order issued against

it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

42.3.3 If the Contract is terminated under GC Sub-Clauses 42.3.1 or 42.3.2, then the Contractor shall immediately

- (a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii)
- (c) remove all Contractor's Equipment from the Site and repatriate the Contractor's and its Subcontractors' personnel from the Site, and
- (d) subject to the payment specified in GC Sub-Clause 42.3.4,
 - (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
 - (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors, and
 - (iii) deliver to the Employer all drawings, specifications and other documents

prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

42.3.4 If the Contract is terminated under GC Sub-Clauses 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in GC Sub-Clause 42.1.3, and reasonable compensation as determined by Employer for all loss, except for loss of profit, or damage sustained by the Contractor arising out of, in connection with or in consequence of such termination. Provided that, the determination by the Employer in this regard shall be final and binding upon the Contractor.

42.3.5 Termination by the Contractor pursuant to this GC Sub-Clause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by GC Sub-Clause 42.3.

42.4 In this GC Clause 42, the expression "Facilities executed" shall include all work executed, Installation Services provided, and all Plant acquired, or subject to a legally binding obligation to purchase, by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this GC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment.

43. Assignment

43.1 Neither the Employer nor the Contractor shall, without the express prior written consent of the other Party, which consent shall not be unreasonably withheld, assign to any third Party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder, except that the Contractor shall be entitled to assign either absolutely or by way of

charge any monies due and payable to it or that may become due and payable to it under the Contract.

44. Export Restrictions

44.1 Notwithstanding any obligation under the Contract to complete all export formalities, any export restrictions attributable to the Employer, to the country of the Employer or to the use of the Plant and Installation Services to be supplied which arise from trade regulations from a country supplying those Plant and Installation Services, and which substantially impede the Contractor from meeting its obligations under the Contract, shall release the Contractor from the obligation to provide deliveries or services, always provided, however, that the Contractor can demonstrate to the satisfaction of the Employer that it has completed all formalities in a timely manner, including applying for permits, authorizations and licenses necessary for the export of the Plant and Installation Services under the terms of the Contract. Termination of the Contract on this basis shall be for the Employer's convenience pursuant to Sub-Clause 42.1.

Claims, Disputes and Arbitration

45. Contractor's Claims

45.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall submit a notice to the EIC, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant

to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the EIC. Without admitting the Employer's liability, the EIC may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the EIC to inspect all these records, and shall (if instructed) submit copies to the EIC.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the EIC, the Contractor shall send to the EIC a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- (a) this fully detailed claim shall be considered as interim;
- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the EIC may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the EIC.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the EIC and approved by the Contractor, the EIC shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of

the claim within such time.

Each Payment Certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

The EIC shall agree with the Contractor or estimate: (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with GC Clause 40, and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

46. Dispute & Arbitration

In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either Party may refer the matter to the Independent Engineer(IE) pursuant to GC 46.1 and thereafter to Conciliation Committee of Independent Experts (CCIE) pursuant to GC 46.2 hereof, however No interest shall be paid by the Employer on the disputed/ claimed amount for the period upto determination and notification of the same to the Contractor by the Engineer/announcement of the reasoned award by the IE/CCIE.

46.1 Independent Engineer

"Independent Engineer" or "IE" means the person so named in the Contract, or appointed under Sub-Clause 20.2 [Appointment of the Independent Engineer] or Sub-Clause 20.3 [Failure to Agree Independent Engineer] in terms of MOP's OM no. 15-18/2020-HYDEL-II(MoP) dated 27.09.2021 with an objective to reduce the conversion of initial disagreements over

issues into full-fledged disputes and for expeditious elimination of disagreements in a just and fair manner. The contractor will propose the panel of 3(three) independent engineers from the approved list of MOP Government of India. The employer shall communicate its decision to contractor for appointment of independent engineer.

46.2 "Conciliation Committee of Independent Experts (CCIE) for Contractual Disputes in Projects implemented by CPSUs/Statutory Bodies under administrative control of Ministry of Power will address the disputes in terms of MOP's F.No. 11/22/2021-Th.II dated 29.12.2021

The contract shall be governed by law of country & place of jurisdiction of courts where the parties are to submit their disputes arising out of or in connection with contract is Chainpur, District Sankuwasabha, Nepal.

47. Protection of the Environment

The Contractor shall take all responsible steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values indicated in the Specification, and shall not exceed the values prescribed by applicable Laws.

The Contractor shall be required to ensure that there shall be no felling of trees by him or his labourers or their family members and he will be solely responsible for their acts in this regard. The Contractor shall try to maintain ecological balance by preventing deforestation, water pollution and defacing of natural landscape in the vicinity of work areas. The Contractor shall so conduct his construction operations as to prevent an unnecessary destruction of, scarring or defacing the natural surroundings in the vicinity of the work area. In order to maintain the ecological balance, the Contractor shall specifically observe the following instructions:

-
- a)** Where unnecessary destruction, scarring, damage or defacing may occur as a result of the Contractor's operation, the same shall be repaired, replanted or otherwise corrected at the Contractor's expense. The Contractor will prevent scattering of rocks and other debris outside the work areas. All work areas shall be smoothed and graded in a manner to conform to the natural appearance of the landscape as directed by the EIC.
 - b)** All trees and shrubs which are not specifically required to be cleared or removed for construction purposes shall be preserved and protected from any damage that may be caused by the Contractor's construction operation and Equipment. The removal of trees or shrubs will be permitted only after prior approval by the EIC. Special care shall be exercised where trees or shrubs are exposed to injuries by Construction Equipment, blasting, excavating, dumping, chemical damage or other operation and the Contractor shall adequately protect such trees by use of protective barriers or other methods approved by the EIC. Trees shall not be used for anchorage.
 - c)** The Contractor's construction activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter contaminants, debris and other objectionable pollutants and wastage into the river. Pollutants and wastes shall be disposed of in a manner and at sites approved by the EIC. The Contractor shall fully comply with Environment Rules and Regulations as applicable in Nepal.
 - d)** In the conduct of construction activities and operation of Construction Equipment, the Contractor shall utilize such practicable methods and devices as are reasonably available to control, prevent and otherwise minimize air pollution. The Contractor shall fully comply with Environment Protection Act, 2053 (1997 A.D.), Nepal.
 - e)** Burning of materials resulting from clearing of tree, bush, combustible construction materials and rubbish shall be avoided.

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- f)** Contractor (including its Sub-contractor) shall provide alternative fuel arrangement i.e. cooking gas/ kerosene oil, electricity free of cost to all its canteen /mess, labourers and staff working in the Project during the whole period of construction activity to avoid felling of trees for use as firewood. In case alternative fuels supply i.e. kerosene, gas, electricity is not available in the project area, the Contractor shall approach the forest department/forest corporation, GoN to open fuel depot in the project area for meeting the demand of fuel wood.
 - g)** No wood shall be used for scaffolding, shuttering or centering in the construction of Works.
 - h)** Wood, if required, shall have to be purchased from the Forest Department, GoN.
 - i)** The Contractor shall be required to prevent flowing of debris and muck in to the river. Necessary retaining structures like walls/crates etc. shall be constructed (as per Final EIA/EMP report of the project) for the purpose. The Contractor shall also stabilize the muck fully i.e. consolidation and compaction of the muck shall be carried out in the muck dump sites, also the restoration of muck dumping sites (as per Final EIA/EMP report of project) before handing it over to the Employer at the end of construction period.
 - j)** Medical facilities as well the recreational facilities shall also be provided to the labourers.
 - k)** All labourers to be engaged for the construction work shall be thoroughly examined by health personnel and adequately treated before they are deployed in the work.
 - l)** Contractor shall employ maximum number of local people in not only un-skilled category but also in semi-skilled and skilled categories by imparting skills through training to selected locals. Detailed plan regarding this should be submitted by the Contractor within two months

from the Commencement Date.

- m)** All the Construction Equipment which are likely to generate high noise levels are to be fully equipped (with noise reduction measures) to meet the ambient noise control standards.
- n)** The Employer shall facilitate/assist Contractors in obtaining necessary permits from District Authorities. The Contractor shall not allow any of its employee / labourers employed by it to settle in the forest area even temporarily.

If any provision(s) is not complied with, within a reasonable time even after issue of a notice in this respect, the necessary operations would be carried out by the EIC at the cost of the Contractor.

The Contractor shall indemnify and hold the Employer harmless against and from all claims, damages, losses and expenses (including legal fees and expenses) resulting from the consequences of any failure by the Contractor to comply with the provisions of this Sub-Clause.

The Contractor shall obtain Consent to Establish for construction activities and permission for establishment of Crusher from concerned government and regulatory authorities.

The Contractor shall also comply with all applicable rules enacted under The Environment (Protection) Act of GoN.

The Contractor shall also be liable to implement the various provisions related to construction sites, workshops and job facilities, etc. mentioned in the Final EIA/EMP report of the project.

Special Terms & Conditions

- The bidders need to consider all taxes in their bid.
- Time is the essence of the work; hence bidders shall consider all kind of resources in their bid to complete the work within stipulated time in all respect.
- Period for procurement, fabrication, testing, erection and commissioning of steel liner at site complete in all respect should be within 9 months from the date of award. Bidders should accordingly submit details of resources & planning such as manpower, machinery, material and schedule etc.
- Design and General arrangement drawings of PSSL have already been approved. Fabrication / Development drawings needs approval from SAPDC.
- The Man Holes assemblies and Ring Girder Support if required in later stage shall bear the same unit price (per MT) quoted in the Price Schedule (BOQ) for Reducers.

Section 4 - Contract Forms

Section 4 - Contract Forms

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1. LETTER OF TENDER

{Refer ITB Clause-13.1, 14 & 21}

Name of Contract.....

To: (Name and Address of Employer)

Sir,

1.0 Having examined the Bid Documents, including Addenda Nos. *(Insert Numbers)*, the receipt of which is hereby acknowledged, we the undersigned, offer to construct and install such Works and remedy the defects therein in conformity with the Conditions of Contract, Specifications, Drawings, Bill of Quantities, Appendix to Bid and addenda (if any) for the sum as specified in the Appendix to Bid or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.0 Attachments to the Letter of Tender:

In line with the requirement of the Bid Documents we enclose herewith the following Attachments to the Letter of Tender:

- (a) **Attachment 1:** Bid Security in the form of Bank Guarantee (in original) No.----- dated----- issued by -----[Name and address of the Bank] for a sum of *(Name of currency and amounts in words & figures)* valid upto and including [date 90 days after the period of bid validity] or NSIC Certificate.
- (b) **Attachment 2:** A power of attorney complying with the requirement of ITB Clause No. 5.1(a) indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 17.
- (c) **Attachment 3:** The documentary evidence establishing in accordance with ITB Clause 3 that we are eligible to bid and in terms of ITB Clause 5.1(e) are qualified to perform the contract if our bid is accepted.
- (d) **Attachment 4:** Bids with Manufacturer(s):

Bids submitted by a bidder with sub-contractor/Manufacturer(s) shall comply with the following requirements:

- (i) Undertakings by the Bidder and his sub-contractor(s) / Manufacturer(s) that the Bidder /sub-contractors/Manufacturer shall be responsible for execution of that item of work for which they claim to have specific construction experience.
- (ii) A Joint Deed of Undertaking by the Bidder and his sub-contractor(s) / Manufacturer(s).

(e) **Attachment 5:** Bids by Merged/Acquired/subsidiary company:

Bids submitted by a subsidiary company shall comply with the following requirements:-

- (i) Undertaking by the Parent/holding Company evincing full technical and financial support to the subsidiary and commitment by the parent/holding company to take up the work itself in case of non- performance of the subsidiary company and to provide additional performance guarantee and also to enter into separate agreement with the Employer to that effect.

(f) **Attachment-6:** - Undertaking regarding blacklisting.

Undertaking regarding blacklisting in accordance with Sub-Clause-3.2 of ITB.

(g) **Attachment-7:** Joint Venture/Consortium Agreement (attested by Notary Public) and signed between Lead Partner and the other Partner(s) of JV/C as per Sub-Clause-13.2 (i).

(h) **Attachment-8:** Deviations

Attachment-8(i) without cost of withdrawal and Attachment-8 (ii) with cost of withdrawal of such deviations. [As per ITB 13.2 (h)]

#.....
.....

(Any other Attachment, if required, shall be added here)

3.0 Bill of Quantities:

- 3.1 In line with the requirements of the Bid Documents, we enclose herewith the Bill of Quantities, duly filled-in as per your proforma. Any other Schedule if required, shall be added here.
- 3.2 We are aware that the Bill of Quantities do not generally give a full description of the work to be performed under each item and we shall be deemed to have read the Technical Specifications and other Bid Documents and Drawings to ascertain the full scope of work included in each item while filling-in rates and prices. We agree that entered rates and prices shall be deemed to include for the full scope as aforesaid, including applicable taxes, duties, Cess & levies etc. and overhead and profit.
- 3.3 We declare that as specified in General Condition of Contract (Clause 13.7 & 13.8) and Particular Condition of Contract (Sub Clause 13.7 & 13.8), the rates of Bill of Quantities shall be subject to adjustment. Our prices are inclusive of all the applicable taxes, duties, levies, Cess, royalties and octroi for the performance of the Contract.
- 3.4 We confirm that we have examined and are aware of the conditions and adequacy of infrastructural facilities, Construction Equipment and related spares, services lines, partially completed works etc. to be handed over by the Employer for performance of Contract. .
- 4.0 We confirm that we shall get registered with the concerned VAT/Taxation Authorities, in Nepal, where the project is located. We also confirm that we shall produce the Permanent Account Number issued by Nepalese Income Tax Authorities to the EIC, within 28 days from the date of issue of Letter of Acceptance, if the work is awarded to us.
- 4.1 We confirm that no VAT/Entry tax/custom duty/Levies in any form shall be payable by you for the bought out items which are dispatched directly by us/our Assignee to the project site..
- 5.0 We undertake, if our bid is accepted, to commence the work immediately upon your Letter of Acceptance to us, and to achieve Completion of Works within the time stated in the Bid Documents.

6.0 If our bid is accepted, we undertake to provide a Performance Security in the form and amounts, and within the time specified in the Bid Documents.

7.0 We agree to abide by this bid for a period of 180 days from the date fixed for submission of bids as stipulated in the Bid Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

8.0 Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and Purpose of Commission address of agent gratuity	Amount and Currency	or
-----	-----	-----
---	---	---
.....

(if none, state "none").

9.0 Until a formal Contract is prepared and executed between us, this bid, together with your written acceptance thereof in the form of your Letter of Acceptance shall constitute a binding contract between us.

10.0 We understand that you are not bound to accept the lowest or any bid you may receive. We acknowledge the right of the Employer to reject our Bid without assigning any reason or otherwise and hereby waive our right to challenge the same on any account whatsoever.

11.0 All information provided in my/our Bid and attachments thereof is true and correct and all documents copies of which are attached with our Bid as attachments are true copies of their respective originals.

12.0 I/ We hereby certify that I/we / any of the Joint Venture/Consortium Members (the "JV Members") have not been banned /de-listed/black listed/debarred from business by Government of Nepal /any PSU/any Government Department during last 03 (three) years on grounds of corrupt/fraudulent

practices and/or due to non-performance and/or by Ministry of Power, Government of India/SJVN/SAPDC on any grounds.

- 13.0 I/We hereby declare that only the persons or firms interested in this proposal as principals are named in our Bid and that no other person or firm or company other than those mentioned in our Bid has any interest in this bid submission or in the Contract to be entered into and in good faith, without collusion or fraud, if our Bid is accepted as evidenced by issue of Letter of Acceptance to us.
- 14.0 We understand that you may annul the bidding process and reject all bids or accept or reject any of the bids at any time and that you are neither bound to accept any bid that you may receive nor to invite the Bidders to bid for Works, without incurring any liability to all or any of the Bidders.
- 15.0 We believe that we/our Joint Venture/Consortium continue to satisfy (ies) the eligibility criteria and meet(s) the requirements as specified in the Bid Documents and are/is qualified to submit a Bid in accordance therewith.
- 16.0 We declare that we/any Member of our Joint Venture/Consortium are/is not a Member of any other Joint Venture/Consortium submitting a Bid for the Works pursuant to the Bid Document.
- 17.0 We have studied all the Bid Documents carefully and understood all local and site conditions affecting the execution of the Works. We understand that except to the extent as expressly set forth in the Contract, we shall have no claim, right or title arising out of any documents or information provided to us by the Employer or in respect of any matter arising out of or concerning or relating to the bidding process including the award of Works to the selected bidder.
- 18.0 We acknowledge and confirm that upon issue of Letter of Acceptance to us consequent to acceptance of our Bid, a binding contract for execution of the Works shall come into existence on the terms set forth in our Bid together with your Letter of Acceptance. We undertake to commence the work upon issue of your said Letter of Acceptance, and to achieve Completion within the time stipulated in the Bid Documents.
- 19.0 We agree and understand that the Bid is subject to the provisions of the Bid Documents. In no case, we shall have any claim or right of whatsoever nature if the Works is not awarded to us or our Bid is not opened.

20. We, hereby, declare that only the persons or firms interested in this proposal as principals are named here and that no other persons or firms other than those mentioned herein have any interest in this proposal or in the Contract to be entered into, if the award is made on us, that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal is in all respects for and in good faith, without corrupt/fraudulent/collusive/coercive practice .

Dated this.....day of.....2016

Thanking you, we remain,

Yours faithfully,

(Signature)
(Printed Name)
(Designation)
(Common Seal)

Date :

Place :

Business Address:

Country of Incorporation:

(State or Province to be indicated)

Name & Address of the Principal Officer:

ATTACHMENT - 1
{Refer ITB Clause-18}

(To be executed on Non-Judicial Stamp Paper of Appropriate value)

Bid Security Form

Bank Guarantee

Date: _____

(Name of Contract)

To: (Name and address of Employer)

WHEREAS (name of Bidder) (hereinafter called "the Bidder") has submitted its Bid dated (date of bid) for the performance of the above-named Contract (hereinafter called "the Bid")

KNOW ALL PERSONS by these present that WE (name of Bank) of (address of bank) (hereinafter called "the Bank"), are bound unto (name of Employer) (hereinafter called "the Employer") for the sum of: (amount), for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents.

THE CONDITIONS of this obligation are as follows:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Letter of Tender, or adopts corrupt or collusive or coercive or fraudulent practices.
2. If the Bidder, having been notified of the acceptance of its Bid by the Employer during the period of bid validity.
 - a) fails or refuses to sign the Contract Agreement when required, or
 - b) fails or refuses to submit the performance security in accordance with the Bid Documents.

WE undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will mention that the amount claimed by it is due, owing to the occurrence of one or both of the two above-named CONDITIONS, and specifying the occurred condition or conditions.

(**)

This guarantee will remain in force up to and including (date 90 days after the period of bid validity), and any demand in respect thereof must reach the Bank not later than the above date.

For and on behalf of the Bank

-

in the capacity of

—

Common Seal of the Bank

Note: 1. (**) Employer may also present any of his demands at the counters of the(*Name and address of the branch of the Bank in India*).....for further relay to us.
(To be inserted in case of a foreign currency bank guarantee issued by an overseas bank outside India)

INSTRUCTIONS FOR EXECUTION OF BANK GUARANTEE FOR BID SECURITY

1. For the purpose of Stamp Duty on the Bank Guarantee, the law prevalent in the country of execution of Bank Guarantee shall prevail.
2. The executing officers of the Bank Guarantee for Earnest Money/Bid Security shall clearly indicate in (block letters) his name, designation, Power of Attorney No. / Signing Power No. as well as telephone/ fax numbers with full correspondence address of the issuing Guarantee etc.
3. Each page of the Bank guarantee for Earnest Money Deposit shall be duly signed/initialed by the executing officers and the last page shall be signed in full, indicating the particulars as aforesaid (sub-para 2) under the seal of the Bank.

Bank Guarantee in NPR should be executed on letter head of the "A" class commercial Bank. The issuing Bank shall be requested independently for verification/confirmation of the Bank Guarantee issued, non confirmation of which may lead to rejection of 'Bid Security. The Bank Guarantees in INR shall be acceptable only if these are issued by a Scheduled Bank of India duly counter-guaranteed by any A class bank in Nepal.

6. Bank Guarantee for Bid security in original shall be submitted alongwith the Bid. However, the issuing Bank shall submit an unstamped duplicate copy of Bank Guarantee directly by registered post (A.D.) to the Employer (authority inviting tenders) with a forwarding letter.

***ATTACHMENT-2 (i)**

{Refer ITB Sub- Clause-5.1 a)}

(a typical sample Format to be adopted suitably)

POWER OF ATTORNEY

(On Non-Judicial Stamp Paper of Appropriate value / letter head of firm, as applicable under laws of country where POA is executed)

KNOW ALL MEN BY THESE PRESENTS THAT WE M/S
 A COMPANY
 ORGANISED AND EXISTING UNDER THE LAWS OF (NAME OF COUNTRY
) AND HAVING ITS REGISTERED/PRINCIPAL
 OFFICE /PLACE OF BUSINESS
 AT..... REPRESENTED BY (NAME OF
 PERSONS) (THE "EXECUTANT") DO HEREBY NOMINATE, CONSTITUTE,
 AUTHORIZE AND APPOINT MR. [.....*Name of Attorney*.....] , SON
 OF [.....], RESIDENT OF [.....]
 AND PRESENTLY EMPLOYED WITH], A COMPANY/ CORPORATION
 ORGANISED AND EXISTING UNDER THE LAWS OF
 (NAME OF THE COUNTRY) AND HAVING
 ITS REGISTERED OFFICE/PRINCIPAL PLACE OF BUSINESS AT
 AS OUR TRUE AND LAWFUL ATTORNEY (THE
 "ATTORNEY") TO DO IN OUR NAME AND ON OUR BEHALF ALL OR ANY
 OF THE FOLLOWING ACTS, DEEDS AND THINGS IN CONNECTION
 WITH OR IN RESPECT OF OR RELATING TO THE NOTICE INVITING
 TENDER NO. DATED (THE "NIT") ISSUED BY SJVN Arun-
 3Power Development Company (P) Ltd. (SAPDC), A COMPANY
 ORGANISED AND EXISTING UNDER THE LAWS OF NEPAL AND HAVING
 ITS REGISTERED OFFICE/PRINCIPAL PLACE OF BUSINESS (AT
 (THE "EMPLOYER") FOR THE EXECUTION,
 CONSTRUCTION AND DEVELOPMENT OF THE WORKS DESCRIBED IN
 THE NOTICE INVITING TENDER (NIT) (THE "WORKS") THAT IS TO
 SAY:

1. TO PREPARE, OFFER, SIGN, SUBMIT AND DELIVER TO THE EMPLOYER THE EXECUTANT'S BID FOR THE WORKS PURSUANT TO THE NIT (THE "BID") INCLUDING TO MAKE, SIGN (JV/Consortium Agreement), SUBMIT, DELIVER, EXECUTE, AND ACCEPT ALL DOCUMENTS, INCLUDING JOINT VENTURE/CONSORTIUM AGREEMENT, INFORMATION, APPLICATIONS AND OTHER WRITINGS NECESSARY FOR OR INCIDENTAL TO THE SIGNING, SUBMISSION AND DELIVERY OF THE BID TO THE EMPLOYER;

2. TO NEGOTIATE, ENTER INTO, SIGN AND EXECUTE, ACCEPT AND DELIVER ALL CONTRACTS UNDERTAKINGS, ACCEPTANCES AND OTHER WRITINGS CONSEQUENT UPON ACCEPTANCE OF THE EXECUTANT’S BID;
3. PARTICIPATE IN BIDDERS’ AND OTHER CONFERENCES AND PROVIDE ALL INFORMATION REQUIRED BY THE EMPLOYER AND TO FURNISH/SEEK CLARIFICATIONS ARISING OUT OF OR RELATING TO THE NIT AND, UPON AWARD OF THE CONTRACT CONSEQUENT TO THE ACCEPTANCE OF THE EXECUTANT’S BID BY THE EMPLOYER;
4. TO REPRESENT AND ACT ON BEHALF OF THE EXECUTANT IN RESPECT OF ALL MATTERS BEFORE THE EMPLOYER RELATING TO THE EXECUTANT TO BID AND UPON THE ACCEPTANCE OF THE EXECUTANT’S BID BY THE EMPLOYER INCLUDING THE RESULTANT CONTRAT ON SUCH THE ACCEPTANCE OF THE EXECUTANT’S BID (THE “CONTRACT”) IN RESPECT OF ALL MATTERS RELATING TO OR ARISING OUT OF OR CONCERNING THE CONTRACT AND TO GENERALLY DEAL WITH THE EMPLOYER ON BEHALF OF THE EXECUTANT IN ALL MATTERS ARISING OUT OF OR IN CONNECTION WITH OR RELATING TO OR ARISING OUT OF THE EXECUTANT’S BID. THE NIT AND THE CONTRACT IN THE EVENT OF ACCEPTANCE OF THE EXECUTANT’S BID BY THE EMPLOYER;
5. AND GENERALLY TO DO ANY AND ALL OTHER AND FURTHER ACTS, DEEDS AND THINGS WHICH ARE NECESSARY FOR OR INCIDENTAL TO OR DEEMED APPROPRIATE FOR MORE EFFECTUAL EXERCISE OF THE POWERS HEREBY CONFERRED.

AND We, the Executant above named do hereby agree and undertake to ratify and confirm and do hereby ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Attorney pursuant to and in exercise of the powers hereby conferred and all acts, deeds and things done or caused to be done by our said Attorney pursuant hereto shall always be deemed to be the acts, deeds and things done by the Company itself.

IN WITNESS WHEREOF, THIS POWER OF ATTORNEY ON THIS [.....] DAY OF [.....], [20.....].....

..... has been executed under the common seal of the Company, at -----(name of place).

For [Name of the Executant]

By

(Name of Officer)

Title

WITNESSES

1.

2.

[Notarized]

Notes:

- ◆ The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
- ◆ The Bidder should submit for verification the extract of the charter documents and documents such as a resolution of its Board of Director/ power of attorney in favour of the person executing this Power of Attorney for delegation of power hereunder on behalf of the Bidder.

* Strike out the form, if not applicable for the bidder.

***ATTACHMENT-2 (ii)**

(a typical sample Format to be adopted suitably)

**POWER OF ATTORNEY OF LEAD MEMBER OF THE
CONSORTIUM/JOINT VENTURE**

Whereas the [Name and Address of the Employer] (the "Employer") has by its Notice Inviting Tender (NIT) No. dated (the "NIT") invited bids for construction of the works described therein (the "Works"); and

Whereas, _____, _____ and _____ (collectively the "Joint Venture" or "Consortium") being Members of the Joint Venture with _____ as its leader (the "Lead Member") are interested in bidding for the Works in accordance with the terms and conditions of the "Bid Documents", and

Whereas it is necessary for the Members of the Joint Venture to vest the Lead Member with all necessary power and authority to do for and on behalf of the Joint Venture, all acts, deeds and things as may be necessary in connection with the Joint Venture's bid for the Works and its execution.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS WE

- (i) [.....], a company organized and existing under the laws of [.....] and having its registered office at [.....] represented by (name of Person) and
- (ii) _____, a company organized and existing under the laws of [.....] and having its registered office at [.....] represented by (name of Person) (Collectively the "JV Members") do hereby irrevocably designate, constitute, nominate, appoint and authorize the Lead Member _____, a company organized and existing under the laws of _____ and having its Registered Office at _____ as the Leader of the Joint Venture and our duly constituted true and lawful Attorney (hereinafter called the 'Attorney') to do for and in respect of or relating to proposed Bid of the Joint Venture for the Works in response to the NIT dated ---- (the "JV Bid") and in the event of acceptance of JV Bid in our name and on our behalf all or any of the following acts, deeds and things that is to say:
1. To represent the Joint Venture and each of the JV Members in all dealings with the Employer in relation to the JV Bid

and upon acceptance of the JV Bid and consequent award of the contract to the Joint Venture (the "Contract") with respect to all matter arising out of or relating or incidental to the Contract;

2. To prepare, sign, submit and deliver to the EMPLOYER the JV Bid for the works pursuant to the above NIT including to sign, submit and deliver, execute, accept and deliver all documents, information, applications and other writings necessary for or incidental to the signing, submission and delivery of the Bid.
3. To negotiate, enter into, sign and execute, accept and deliver the Contract and all other undertakings, acceptances and writings consequent upon acceptance of the JV Bid by the Employer;
4. Participate in Bidders and other conferences and provide all information required by the EMPLOYER and to furnish/seek clarifications arising out of or relating to the Bid Document and the JV Bid and the Contract in the event of acceptance of the JV Bid by the EMPLOYER;
5. To represent and act on behalf of the Joint Venture and the JV Members in respect of all matters before the EMPLOYER relating to the Joint Venture, the JV Bid and, upon the acceptance of the JV Bid by the EMPLOYER including the resultant Contract on such the acceptance of the JV Bid, in respect of all matters relating to or arising out of or concerning the Contract and to generally deal with the EMPLOYER on behalf of the Joint Venture and the JV Members in all matters arising out of or in connection with or relating to or arising out of the Bid Document, the JV Bid and the Contract in the event of acceptance of the JV Bid by the EMPLOYER;
6. To sub-delegate all or any of the powers hereby conferred to such person or persons including any employees of the Attorney and/or of all or any of the JV Members as the Attorney may in its sole discretion deem appropriate;
7. And generally to do any and all other and further acts, deeds and things which are necessary for or incidental to or deemed appropriate for more effectual exercise of the powers hereby conferred.

AND nothing contained herein shall derogate from the Attorney’s responsibility as leader of the Joint Venture to ensure performance of the Contract including performance of their respective portion of the Contract by the JV Members. Provided however all the JV Members shall be jointly and severally liable for performance of the Contract and failure of one or more of the JV Members to perform their respective portions of the Contract shall be deemed to be a default by all the JV Members.

AND we the above named JV Members do hereby declare that this power of Attorney shall remain valid, binding and irrevocable till the earlier of the completion of the Defect Notification Period in terms of the Contract(s) if the JV Bid is accepted by the Employer, or the award of the Works under the NIT dated ----- to any other bidder.

AND we the above named JV Members do hereby agree and undertake to ratify and confirm and do hereby ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Attorney pursuant to and in exercise of the powers hereby conferred and all acts, deeds and things done or caused to be done by our said Attorney in exercise of the power hereby conferred shall always be deemed to be the acts, deeds and things done by the Joint Venture Company.

In witness whereof we the JV Members above named have executed this Power of Attorney on this day of under their respective common seal(s), at ----- (name of place).

COMMON SEAL

(1) For
[.....]
By _____

[(Signature of authorized representative)]
Name:
Designation: Director.

The common Seal of [.....] has been affixed, pursuant to the resolution passed by its Board of Directors at their meeting held on [.....], in the presence of Mr. [.....], Director who has affixed his signatures hereinabove in confirmation thereof.

(2) For [-----]
By _____

(Signature of authorized
representative)

Name:

Designation: Director.

The common Seal of [.....]
has been affixed, pursuant to the
resolution passed by its Board of
Directors at their meeting held
on [.....], in the presence of
Mr. [.....], Director who has
affixed his signatures
hereinabove in confirmation
thereof.

Note:

- ◆ The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants and when it is so required, the same should be under common seal affixed in accordance with the required procedure, and
- ◆ Shall be signed by the authorized representatives of each Member of the Joint Venture / Consortium.
- ◆ Copy of charter documents and documents such as resolution/other Authorization in favour of executants of Power of Attorney is attached hereto for verification.

* Strike out the form, if not applicable for the bidder.

ATTACHMENT - 3

Form of Declaration

(Refer ITB Sub-clause 5.1.e)

A DECLARATION IN RESPECT OF THE SUBMITTED BID DOCUMENTS/ PROPOSALS

Subject: In respect of National Competitive Bidding for Execution of **Package - _____ of _____ Hydroelectric Project.** It is declared without any reservation whatsoever that:

- 1) the submitted Techno-Commercial/Price Bid proposals are strictly in conformity with the documents issued by the Employer.
- 2) We are familiar with all the requirements of the Contract and has not been influenced by any statement or promise of any person of the Employer.
- 3) We are experienced and competent Bidder to perform the Contract to the satisfaction of Employer and are familiar with all general and special laws, acts, ordinances, rules and regulations of the Municipalities, District, State and Central Government of Nepal that may affect the work, its performance or personnels employed therein.
- 4) We hereby authorize the Employer to seek reference from our bankers for its financial position and undertake to abide by all labour welfare legislations.
- 5) The above statement submitted by us is true and correct to our best knowledge.

(To be Jointly Signed by all the authorized representatives of each of the Members of the Joint Venture or Consortium)

.....

N.B: WITHOUT THIS CERTIFICATE BID IS LIABLE TO BE REJECTED.

***ATTACHMENT- 4 (i)**
{Refer ITB Clause-5.3(i)}

UNDERTAKING FROM SUB-CONTRACTOR/ MANUFACTURER

{Refer ITB Clause-5.3(i)}

No:
.....

Date:

To,

_____.

Dear Sirs,

We, M/s..... having registered office atdo hereby undertake that in case work(Name of work) is awarded to M/s (Name of the Bidder), we shall execute the work of “_____” (the components of the work for which the Bidder has proposed to associate the sub-contractor/Manufacturer), as sub-contractor to M/s..... (Name of the Bidder) and we shall be responsible for successful completion of the job covered under our scope for which we shall submit a joint Deed of Undertaking as per approved format of Employer included in the Bid Document and also agree to provide an additional Performance Bank Guarantee of 3%(three percent) of value of sub-let portion of works in addition to normal Performance Bank Guarantee, as per the format included in the Bid Document.

We do hereby also confirm that we are not participating either as a sole Bidder or as a partner of a Joint Venture/consortium Bidder against the above Notice Inviting Tender.

Yours faithfully,

For & on behalf of M/s.
(Name & Address of the Manufacturer/Sub-Contractor)

(Office Seal)

Station:

Date:

Note: i) *This letter of Authorization should be on the letterhead of the sub-contractor and should be signed by a person competent and having the Power of attorney to bind the sub-Contractor.*

Power of Attorney in favour of this person to do so may be enclosed with this Letter of Undertaking.

ii) In case a bidder/JV has been qualified for any of the work on the credential of a proposed Manufacturer/sub-contractor of the bidder/JV partner, he shall be required to submit a joint deed of undertaking (as per agreed format) from the proposed Manufacturer/subcontractor and contractor for joint and several responsibility of execution of Work sub-contracted to the sub-contractor/Manufacturer.

* Strike out the form, if not applicable by the bidder.

ATTACHMENT- 4 (ii)*PROFORMA OF JOINT DEED OF UNDERTAKING BY THE SUB-CONTRACTOR/*Manufacturer* AND THE BIDDER/CONTRACTOR {Refer ITB Clause-5.3(ii)}****(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)**

THIS DEED OF UNDERTAKING executed this day of..... Two Thousand and by M/s., a Company incorporated under the laws of and having its Registered Office at (hereinafter called the “Sub-Contractor/***Manufacturer***” which expression shall include its successors, executors and permitted assigns), and M/s....., a Company incorporated under the laws of having its Registered Office at (hereinafter called the “Bidder” which expression shall include its successors, executors and permitted/ assigns) in favour of SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal (hereinafter called the “Employer” which expression shall include its successors, executors and permitted assigns)

WHEREAS the “Employer” invited Bids vide its Invitation No. for Construction of

.....

AND WHEREAS ITB Clause No. 5.3(iii) of, Vol.-0 forming part of the Bid Documents inter-alia stipulates that in order to ensure serious participation of the Sub-contractor(s)/***Manufacturer*** for work proposed to be executed by the Sub-contractor(s)/***Manufacturer***, a Joint Deed of Undertaking shall be required to be submitted by the Contractor and Sub-contractor(s) /***Manufacturer***

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Reference No. dated based on the association of the Sub-Contractor.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

- 1.0 In consideration of the award of Contract by the Employer to the Bidder (hereinafter referred to as the “Contractor”) we, the Sub-Contractor and the Bidder/Contractor do hereby declare that we shall be jointly and severally bound to the Employer, for the successful performance of the * (proposed sub-let works) in accordance with the Contract.
- 2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Sub-

Contractor in particular hereby agrees to deploy and depute its technical personnel, equipment, manpower and/or other resources on continual basis throughout the construction period of the proposed sub-let works until its completion to discharge the obligations of the Contractor under the Contract.

- 3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of Nepal and the Courts Chainpur, district Sankhuwasabha, Nepal shall have exclusive jurisdiction in all matters arising under the Undertaking.
- 4.0 Apart from the Contractor’s Performance Guarantee, the Sub-Contractor/**Manufacturer** shall furnish as security, a Contract Performance Guarantee from its Bank in favour of the Employer in a form acceptable to the Employer. The value of such guarantee shall be equivalent to 3% (three percent) of value of the proposed sub-let works as identified in the Contract awarded by the Employer to the Bidder/Contractor and it shall be an additional guarantee for faithful performance/compliance of this Deed of Undertaking in terms of the Contract. The guarantee shall be unconditional, irrevocable and valid till the completion of the part of the Works executed by the Sub-Contractor. The Bank Guarantee amount shall be payable to the Employer on demand without any reservation or demur.
- 5.0 We, the Sub-Contractor/**Manufacturer** and the Bidder/Contractor agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till it is discharged by the Employer. It shall become operative from the Commencement Date of the Contract.

IN WITNESS WHEREOF, the Sub-Contractor and the Bidder/Contractor have through their Authorized Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned, at -----
(name of place).

WITNESS

For Sub-Contractor/Manufacturer

1.
(Signature)

(Name in Block Letter)
(Office Address)
Company

Signature of Authorized
(Representative)

Name
Common Seal of
.....

	For Bidder/Contractor
2. (Signature)	Signature of Authorized (Representative)
(Name in Block Letter)	Name.....
(Office Address)	Common Seal of
Company

This Joint Undertaking is to be given if the Contractor qualifies on the strength of Sub-Contractor.

(To be Notarized by Notary Public)

ATTACHMENT 5 (i)*UNDERTAKING BY THE PARENT/HOLDING COMPANY
{Refer ITB Clause-5.4 (i)}**

(On letter head of Parent/Holding Company)

No:

Date:.....

To,

(Name and Address of Employer)

Sub: Invitation for Bidding for Package _____ - of
_____ **HE Project,**
_____.

Dear Sirs,

We, M/s (Name of the Parent/Holding Company) having registered office at(Address of the Parent/Holding Company).....do hereby undertake that in case work of Construction of Package –C-3 of Arun-3 HEP is awarded to M/s (Name of the Bidder), who is participating in your subject Tender as a Sole Bidder/constituent of JV/Consortium partner, which is our subsidiary company, we on our strength/strength of -----(name of group company(ies)) under our control shall provide the full support for technical and financial requirements for the work "-----" (the scope of work of subsidiary company) and we shall be responsible for successful completion of the job covered under the scope of M/s(Name of Subsidiary company).

In case the Bidder, M/s(Name of Subsidiary company) gets qualified/techno-commercially responsive and awarded the work, We do hereby undertake;

- (i) to enter into a separate agreement with the Employer as per the Employer's approved format included in the Bid documents.
- (ii) to furnish an additional performance Bank guarantee of value equivalent to three (3%) percent of the Contract Price/three (3%) percent of the portion of work (where the Subsidiary Company is a Joint Venture Partner/Consortium Bidder) as the case may be, if the subsidiary Company is qualified on the strength of Parent Company or group company(ies) under the control of Parent/Holding Company.

We do hereby also confirm that we are not participating either as a sole Bidder or as a sub-contractor against the above Invitation.

Yours faithfully,

For & on behalf of M/s.
(Name & Address of the Parent/holding Company)

(Office Seal)

Station:

Date:

Note: This letter of authorization should be on the letterhead of the Parent/Holding Company and should be signed by a person competent and having the Power of attorney to bind the Parent/Holding Company. Power of Attorney in favour of this person to do so be enclosed with this Letter of Undertaking.

* : undertaking to be given by the parent/holding company if Subsidiary company was prequalified on the strength of parent/holding company.

ATTACHMENT-5 (ii)*PARENT/HOLDING COMPANY AGREEMENT**

(To be executed on non-judicial Stamp paper of appropriate value)

{Refer ITB Clause-5.4 (ii)}

(For sole Bidder)

THIS AGREEMENT IS MADE on this the..... day of between the SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the subject or context or meaning thereof include its successors, administrators, executors and assigns) of the one part; and(name of Parent/holding Company) a company organized and existing under the laws of..... and having its Principal Office at (Hereinafter referred to as the "Parent/holding Company" which expression shall unless repugnant to the subject or context or meaning thereof include its successors, administrators, executors and assigns) of the other part;

WHEREAS on the Parent/holding Company's commitment to provide full support for technical and financial requirements and be responsible and liable for successful completion of the works being awarded to M/s..... (name of Subsidiary Company) and further agreeing to enter into a separate agreement with the Employer besides furnishing an additional Performance Bank Guarantee of value equivalent to 3% of the Contract Price, the Employer has entered into a Contract with M/s (hereinafter referred to as the "Bidder" which expression shall unless repugnant to the subject or context or meaning thereof include its successors, administrators, executors and permitted assigns) for the execution of Package - _____, _____ H.E. Project. (hereinafter referred to as the "Contract").

And whereas, in consideration of the aforesaid commitment, the Parent/holding Company hereby enters into this agreement with the Employer for providing full support for technical and financial requirements to the Bidder and be responsible and liable for successful performance and completion of the works described in the said Contract on the following terms and conditions:

NOW THEREFORE THE PARTIES HERETO HEREBY AGREE AND THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement except where the context otherwise requires, the following expressions shall have the meaning hereinafter respectively assigned to them:

-
2. "Contract" shall mean the Contract dated entered into between the Employer and the Bidder for the execution of the Work described therein for Package - _____, _____ H.E. Project
- 3.(a) The Parent/holding Company hereby agrees to the Employer to ensure due and faithful performance of the obligations and liabilities by the Bidder under the Contract and remain responsible to irrevocably and unconditionally provide full technical and financial support to the Bidder for completion of the works covered under the Contract. The provisions of Contract shall mutatis-mutandis apply to the Parent/holding Company.
3. (b) In the event of breach and/ or failure on the part of the Bidder to perform or fulfill any of its obligations and liabilities under the Contract, the Employer may at its discretion call upon the Parent/holding Company and the Parent/holding Company shall be obliged to execute and perform or cause to be executed and performed and to satisfy the obligations and liabilities of the Bidder under the Contract in accordance with the terms and conditions thereof without prejudice to any other right or remedy, besides encashing the Bank guarantee(s).
- 3(c) The Parent/holding Company shall indemnify and keep indemnified and harmless the Employer at all times against any loss, damage, cost charge and expense whatsoever that may be suffered or incurred by or caused to the Employer on account of such breach.
- 3(d) It shall not be necessary for the Employer to proceed against the Bidder before proceeding against the Parent/holding Company and the Parent/holding Company shall be liable to fulfill its obligations and liabilities hereunder notwithstanding the Employer having undertaken any proceedings and/or obtaining any security from the Bidder for the performance of its obligations under the Contract. In order to give affect to this Agreement, the Employer may at its option be entitled to act as if the Parent/holding Company was the Bidder for successful completion of the works.

In the event, qualification of the Bidder/Subsidiary Company is considered on the credentials of another Subsidiary/Group Company under the same Apex 'Parent/holding Company' and due to any reason whatsoever, 'Parent/holding Company' or any other Group Company wants to divest its investment in the direct or indirect subsidiary (ies) as a result of which any

of these companies may not remain subsidiary (ies) of the 'Parent/holding Company' then the 'Parent/holding Company' undertakes to ensure the performance of the works by arranging the required inputs in case of failure of Subsidiary Company.

- 3(e) However, where the Bidder disputes the occurrence of a breach under the Contract and if such dispute is referred to arbitration in terms of Conditions of the Contract, the Bidder is obliged to carry on the works under the Contract. In case, during the pendency of the dispute in arbitration, the Bidder does not carry on the work satisfactorily, the Employer by notice to the Parent/holding Company shall be entitled to invoke this Agreement, as if a breach had occurred for the purpose of Clause 3(b) hereinabove.
4. It is agreed that the obligations undertaken by the Parent/holding Company hereunder shall be performed by it notwithstanding any difference or dispute between the Employer and the Bidder pending before any court, tribunal, arbitration or any other authority or forum.
5. This Agreement shall come into force and effect upon the Commencement Date of the Contract/issuance of 'Letter of Acceptance' and shall remain in force and effective till the date of expiry of the Defects Notification Period by the Employer pursuant to the Conditions for the Contract.
6. This guarantee is in addition to and without prejudice to the securities offered by and on behalf of Bidder to the Employer and all rights and remedies in respect thereof be reserved. This guarantee shall be a continuing guarantee and be in force notwithstanding discharge of Bidder by operation of any law or insolvency /bankruptcy /winding up/dissolution of the Bidder.
7. The Employer shall have the full liberty from time to time to vary any of the terms and conditions of the Contract by mutual agreement between the Employer and the Bidder and to extend time for performance thereunder by the Bidder or any other party thereto in accordance with the terms of the Contract and / or to postpone for any time and from time to time any of the powers exercisable by the Employer against the Bidder and either to enforce or forebear from enforcing any of the terms and conditions of the Contract and/or the securities available to the Employer

from the Bidder and the Parent/holding Company shall not be released from its obligations and liabilities under this Agreement in any manner whatsoever by any exercise by the Employer of the liberty and / or the rights with reference to the matters as aforesaid or by reason of time being given to the Bidder or any other act of forbearance, waiver or omission on the part of Employer or any indulgence by the Employer to the Bidder or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of releasing the Parent/holding Company from its obligations and liabilities hereunder.

8. Nothing contained in this Agreement shall be construed or interpreted in any way as modifying or amending or relieving in any manner whatsoever the Bidder from their obligations under the Contract.
9. This Agreement shall be interpreted and be governed under the Law of Nepal.
10. Any dispute or difference which may arise between the parties out of or in connection with this Agreement and which the Parties are unable to settle amicably shall be settled by reference to arbitration as per General/Particular Conditions of Contract. The venue of arbitration shall be _____ and the arbitration shall be conducted in accordance with Nepal Arbitration Act – 2055 (1999). The courts of _____ shall have exclusive jurisdiction provided however that any award made in such arbitration shall be enforceable in any court of competent jurisdiction.

IN WITNESS WHEREOF THE PARTIES HERETO HAVE PUT THEIR HANDS HEREUNTO ON THE..... DAY MONTH ANDYEAR FIRST ABOVE WRITTEN AT

For and on behalf of the Employer
(through _____ authorized representative)

For and on behalf of the Parent/holding Company
(through _____ duly authorized representative)

Witnesses:
1. _____(Signatures)
(Name & Address)
2. _____(Signatures)

Witnesses:
1. _____(Signatures)
(Name & Address)
2. _____(Signatures)

(Name & Address)

(Name & Address)

* Strike out the form, if not applicable by the bidder.

(Notarized by Notary Public)

***ATTACHMENT- 5 (iii)**

(To be executed on non-judicial Stamp paper of appropriate value)

PARENT/HOLDING COMPANY AGREEMENT**{Refer ITB Clause-5.4 (iii)}**

(For Joint Venture/Consortium)

THIS AGREEMENT IS MADE on this the..... day of between the SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the subject or context or meaning thereof include its successors, administrators, executors and assigns) of the one part; and(name of Parent/holding Company) a company organized and existing under the laws of..... and having its Principal Office at (Hereinafter referred to as the "Parent/holding Company" of the Joint Venture Partner M/swhich expression shall unless repugnant to the subject or context or meaning thereof include its respective successors, administrators, executors and assigns) of the other part;

WHEREAS on the Parent/holding Company's commitment to provide full support for technical and financial requirements and be responsible and liable for successful completion of the scope of works of M/s(name of Subsidiary Company) being awarded to Joint Venture of M/s..... (name of Joint Venture) and further agreeing to enter into a separate agreement with the Employer besides furnishing an additional Performance Bank Guarantee of value equivalent to 3% of the Contract Price to the portion of work of M/s of Joint Venture, the Employer has entered into a Contract with the Joint Venture comprising M/s and M/s(hereinafter referred to as the "Bidder" which expression shall unless repugnant to the subject or context or meaning thereof include their successors, administrators, executors and permitted assigns) for the execution of Package - _____, _____ H.E. Project. (hereinafter referred to as the "Contract").

And whereas, in consideration of the aforesaid commitment, the Parent/holding Company hereby enters into this agreement with the Employer for providing full support for technical and financial requirements to its Subsidiary M/s and be responsible and liable for successful performance and completion of the works described in the said Contract on the following terms and conditions:

NOW THEREFORE THE PARTIES HERETO HEREBY AGREE AND THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement except where the context otherwise requires, the following expressions shall have the meaning hereinafter respectively assigned to them:
2. "Contract" shall mean the Contract dated entered into between the Employer and the Bidder for the execution of the Work described therein for Package - _____, _____ H.E. Project.
- 3.(a) The Parent/holding Company hereby agrees to the Employer to ensure due and faithful performance of the obligations and liabilities by M/s (name of Subsidiary Company) under the Contract and remain responsible to irrevocably and unconditionally provide full technical and financial support to M/s (name of Subsidiary Company) for completion of the works covered under the Contract. The provisions of Contract shall mutatis-mutandis apply to the Parent/holding Company.
3. (b) In the event of breach and/ or failure on the part of M/s (name of Subsidiary Company) to perform or fulfill any of its obligations and liabilities under the Contract, the Employer may at its discretion call upon the Parent/holding Company and the Parent/holding Company shall be obliged to execute and perform or cause to be executed and performed and to satisfy the obligations and liabilities of the Bidder under the Contract in accordance with the terms and conditions thereof without prejudice to any other right or remedy, besides encausing the Bank guarantee(s).
- 3(c) The Parent/holding Company shall indemnify and keep indemnified and harmless the Employer at all times against any loss, damage, cost charge and expense whatsoever that may be suffered or incurred by or caused to the Employer on account of such breach.
- 3(d) It shall not be necessary for the Employer to proceed against the Bidder before proceeding against the Parent/holding Company and the Parent/holding Company shall be liable to fulfill its obligations and liabilities hereunder notwithstanding the Employer having undertaken any proceedings and/or obtaining any security from the Bidder for the performance of its obligations under the Contract. In order to give affect to this Agreement, the Employer may at its option be entitled to act as if the Parent/holding Company was the Bidder for successful completion of the works.

In the event, qualification of the Bidder/Subsidiary Company is considered on the credentials of another Subsidiary/Group Company under the same Apex 'Parent/holding Company' and due to any reason whatsoever, 'Parent/holding Company' or any other Group Company wants to divest its investment in the direct or indirect subsidiary (ies) as a result of which any of these companies may not remain subsidiary (ies) of the 'Parent/holding Company' then the 'Parent/holding Company' undertakes to ensure the performance of the works by arranging the required inputs in case of failure of Subsidiary Company.

- 3(e) However, where the Bidder disputes the occurrence of a breach under the Contract and if such dispute is referred to arbitration in terms of Conditions for the Contract, the Bidder is obliged to carry on the works under the Contract. In case, during the pendency of the dispute in arbitration, the Bidder does not carry on the work satisfactorily, the Employer by notice to the Parent/holding Company shall be entitled to invoke this Agreement, as if a breach had occurred for the purpose of Clause 3(b) hereinabove.
4. It is agreed that the obligations undertaken by the Parent/holding Company hereunder shall be performed by it notwithstanding any difference or dispute between the Employer and the Bidder pending before any court, tribunal, arbitration or any other authority or forum.
5. This Agreement shall come into force and effect upon the Commencement Date of the Contract/issuance of 'Letter of Acceptance' and shall remain in force and effective till the date of expiry of the Defects Notification Period by the Employer pursuant to the Conditions for the Contract.
6. This guarantee is in addition to and without prejudice to the securities offered by and on behalf of Bidder to the Employer and all rights and remedies in respect thereof be reserved. This guarantee shall be a continuing guarantee and be in force notwithstanding discharge of Bidder by operation of any law or insolvency /bankruptcy /winding up/dissolution of the Bidder.
7. The Employer shall have the full liberty from time to time to vary any of the terms and conditions of the Contract by mutual agreement between the Employer and the Bidder and to extend time for performance thereunder by the Bidder or

any other party thereto in accordance with the terms of the Contract and / or to postpone for any time and from time to time any of the powers exercisable by the Employer against the Bidder and either to enforce or forebear from enforcing any of the terms and conditions of the Contract and/or the securities available to the Employer from the Bidder and the Parent/holding Company shall not be released from its obligations and liabilities under this Agreement in any manner whatsoever by any exercise by the Employer of the liberty and / or the rights with reference to the matters as aforesaid or by reason of time being given to the Bidder or any other act of forbearance, waiver or omission on the part of Employer or any indulgence by the Employer to the Bidder or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of releasing the Parent/holding Company from its obligations and liabilities hereunder.

8. Nothing contained in this Agreement shall be construed or interpreted in any way as modifying or amending or relieving in any manner whatsoever the Bidder from their obligations under the Contract.
9. This Agreement shall be interpreted and be governed under the Law of Nepal.
10. Any dispute or difference which may arise between the parties out of or in connection with this Agreement and which the Parties are unable to settle amicably shall be settled by reference to arbitration as per General/Particular Conditions of Contract. The venue of arbitration shall be _____ and the arbitration shall be conducted in accordance with the Nepal Arbitration Act – 2055 (1999).. The courts of _____ shall have exclusive jurisdiction provided however that any award made in such arbitration shall be enforceable in any court of competent jurisdiction.

IN WITNESS WHEREOF THE PARTIES HERETO HAVE PUT THEIR HANDS
HEREUNTO ON THE..... DAY MONTH ANDYEAR FIRST ABOVE
WRITTEN AT

For and on behalf of the
Employer
(through _____ authorized
representative)

For and on behalf of the
Parent/holding Company
(through _____ duly authorized
representative)

Witnesses:

Witnesses:

1. _____
(Signatures)

(Name & Address)

2. _____
(Signatures)

(Name & Address)

1. _____
(Signatures)

(Name & Address)

2. _____
(Signatures)

(Name & Address)

* Strike out the form, if not applicable for the bidder

ATTACHMENT- 6**FORM OF DECLARATION OF ELIGIBILITY****UNDERTAKING**

I / We, M/s(Name of Bidder) hereby certify that I / we have not been banned/ de-listed/ black listed/ debarred from business by Government of Nepal or any of its Government Department during last 03 (three) years on grounds of corrupt/fraudulent practices and/or due to non-performance and/or by Ministry of Power, Government of India/SJVN/SAPDC on any grounds.

(Seal & signature of the Bidder)

***ATTACHMENT-7**

(Refer Sub-clause 13.2 (i) of ITB)

FORM OF JOINT VENTURE/CONSORTIUM AGREEMENT**(To be executed on Non Judicial stamp paper of appropriate value)**

This Joint Venture/Consortium Agreement made and entered into on this ----- day of -----, -----.

BY AND BETWEEN

-----**(Name of the Lead Partner)** a Company incorporated under the laws of ----- **(Name of the Country)** with its Head/registered office at ----- **(Address of the Head/Registered Office)*** and a place of business in ----- **(Address of place of business)** hereinafter referred to as "The Lead Partner" which expression unless otherwise repugnant hereto includes its successors, administrators, and permitted assigns thereof, represented by Mr. ----- **(Name of Authorized signatory(ies))**.

AND

-----**(Name of the other Partner)** a Company incorporated under the laws of ----- **(Name of the Country)** with its Head/registered office at ----- **(Address of the Head/Registered Office)*** and a place of business in ----- **(Address of place of business)** hereinafter referred to as **Partner-1** which expression unless otherwise repugnant hereto includes its successors, administrators, and permitted assigns thereof, represented by Mr. ----- **(Name of Authorized signatory (ies))**.

All and/or each of them hereinafter referred to as "the Parties".

WITNESSETH

WHEREAS SAPDC (hereinafter referred to as "The Employer") has issued a Global Invitation vide NIT No. ----- dated -----

for the execution of Package no. _____ of _____ H.E. Project **(hereinafter referred to as "the works")**. The Employer intends to invite bids from eligible Bidders for National Competitive Bidding (NCB) in respect of the above works.

WHEREAS the Parties are interested in jointly preparing and submitting a Bid to qualify, for the Project as a loose knit Joint venture/Consortium.

Article 1.0 PURPOSE OF THIS AGREEMENT

1.1 The purpose of this Agreement is to define the principles of collaboration among the Parties to:

*** Strike out which is not applicable.**

- Submit a Bid jointly to qualify for the execution of Package no. _____ of _____ H.E. Project as a loose-knit Joint venture/Consortium.
- Prepare and submit technical and commercial proposals to the Employer, if invited by Employer.
- Negotiate and sign Contract in case of award.
- Provide and perform the Works in accordance with the Contract.

1.2 NAME

For the purpose of participating in the Bid, the name of the Consortium/Joint Venture shall be "_____".

Article 2.0 LEGAL RELATIONSHIP OF THE MEMBERS

- 2.1 This Agreement shall not be construed as establishing or giving effect to any legal entity such as, but not limited to, a company, a partnership, etc. It shall relate solely towards the Employer for Package no. _____ of _____ H.E. Project and related execution works to be performed pursuant to the Contract and shall not extend to any other activities.
- 2.2 The Parties shall be jointly and severally responsible and bound towards the Employer for the performance of the works in accordance with the terms and conditions of the Bid document and/or Contract.

Article 3.0 LEADERSHIP

----- **(Name of the Lead Partner)** shall act as Leader of the Joint Venture/Consortium. As

such, it shall act as the coordinator of the Party’s combined activities and shall carry out the following functions:

- 3.1 To ensure the technical, commercial and administrative co-ordination of the Project.
- 3.2 To lead the contract negotiations of the Works with the Employer.
- 3.3 The Lead partner is authorized to receive instructions and incur liabilities for and on behalf of any or all Parties.
- 3.4 In case of an award, act as channel of communication between the Employer and the Parties to execute the Contract
- 3.5 Responsible for overall performance of the contract.

Article 4.0 SCOPE OF WORKS AND SERVICES OF EACH PARTY

The Scope of works to be performed by each Party shall be as herein below:

4.1 Scope of Works and Services:

The Scope of Work and services for each Party shall be defined as follows:

4.1.1 (**Name of Lead Partner**) shall be responsible for the following (Define the scope of works):-

-
-
-

4.1.2 (**Name of Other Partner**) shall be responsible for the following (Define the scope of works):-

-
-
-

4.2 Participation Share of each Partner

Lead Partner %
Other Partner %

4.3 Capital Contribution to be made by each Party for the Works

Lead Partner %
Other Partner %

4.4 Financial Commitment of each Party in terms of Contract Price

Lead Partner %
Other Partner %

4.5 Sharing of Profit and Loss by each Party

Lead Partner %
Other Partner %

The payments shall be made in the name of _____ (Name of Joint Venture/ Consortium as appearing in Article 1.2 above).

(Strike out whichever is not applicable)

Article 5.0 SECURITIES

Securities in the form of Bank Guarantees, required under the Bid document and/or Contract shall be provided in the name of individual partner of Joint Venture/Consortium in proportion of its participation share. In case of IndianJV partner or Indian contractor, the Bank Guarantee shall be acceptable only if these are issued by Scheduled Bank of India to be duly counter guaranteed by Class A bank in Nepal.

Article 6.0 LIABILITY

6.1 LIABILITY OF THE PARTIES WITH RESPECT TO CLAIMS OF THE EMPLOYER

The Parties shall be jointly and severally liable to the Employer for the Performance of the work under the terms of the Contract.

6.2 In case there is dispute between the parties to the Joint Venture; the same shall not affect the work of the Employer.

Article 7.0 DURATION OF THE AGREEMENT

7.1 This Agreement is valid until end of Defect Notification Period of the Contract and full and final settlement of all

accounts and disputes, if any, between the Parties and the Employer, except

- a) if the Employer has decided previously not to award the Contract to the Parties, or
- b) if one of the parties is declared bankrupt,

in which case the Parties are free from any obligation under this Agreement.

7.2 The Joint Venture Agreement shall not be terminated by the parties without the written consent of the Employer.

IN WITNESS WHEREOF, this agreement executed on the _____ day of _____ (month) 20____ by the duly authorized representatives of the parties hereto.

For and on behalf of M/s _____
(Lead Partner)

Name:

Seal:

For and on behalf of M/s _____
(Partner-1)

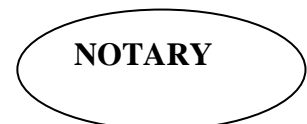
Name:

Seal:

For and on behalf of M/s _____
(Partner-2)

Name:

Seal:



* Joint Venture/Consortium Agreement (attested by Notary Public) and signed between the Partner(s) of JV/C as per above format shall be submitted alongwith the Bids of the Bidders.

ATTACHMENT-8(i)
(Name of the Project)
List of Deviations without Cost of Withdrawal
(To be furnished by the Bidders)

(Bidder's Name & Address):

To :.....
 (Name of the Employer)

Dear Sir,
 Following are the deviations proposed by us as per ITB Clause 13.2 :

S.No.	Clause No. Remarks/Justifications	Deviation

Note :

1. We hereby confirm that all the deviations specified as above in Attachment – 8 (i) are the same which have been mentioned in Attachment – 8(ii) along with its cost of withdrawal and as provided in price bid.
2. We hereby confirm our acceptance and compliance to the critical provisions of GC clauses listed in ITB clause 13.2.

Date : (Signature).....

Place : (Printed Name).....

(Designation).....

(CommonSeal).....

ATTACHMENT –8(ii)
(Name of the Project)
List of Deviations with Cost of Withdrawal
 (to be submitted with Price Bid)

(Bidder's Name & Address):

To :.....
 (Employer's Name & Address)

Dear Sir,

Following are the deviations proposed by us as per ITB Clause 13.2 We are also furnishing below the cost of withdrawal for the deviations proposed by us in Attachment 8 (i). We confirm that we shall withdraw the deviations proposed by us at the cost of withdrawal indicated in this attachment failing which our bid will be rejected .

Deviations:

S.No.	Clause No.	Deviation	Cost of Withdrawal
1.	2.	3.	4.
.....			

.....

In case no specific cost of withdrawal is mentioned against any item in column no. 4, cost of withdrawal of such deviations shall be treated as 'NIL'.

Date : (Signature).....

Place : (Printed Name).....

(Designation).....

(CommonSeal).....

2. Notification of Award - Letter of Acceptance

To: _____

This is to notify you that your Bid dated _____ for execution of the _____ for the Contract Price in the aggregate of _____, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by the Employer.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section IX, - Contract Forms, of the Bidding Document

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Employer: _____

3. Contract Agreement

THIS AGREEMENT is made the _____ day of _____,

BETWEEN

(1) _____, a corporation incorporated under the laws of _____ and having its principal place of business at _____ (hereinafter called "the Employer"), and (2) _____, a corporation incorporated under the laws of _____ and having its principal place of business at _____ (hereinafter called "the Contractor").

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, complete and commission certain Facilities, viz. _____ ("the Facilities"), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

**Article 1.
Contract Documents**

1.1 Contract Documents (Reference GC Clause 2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

- (a) This Contract Agreement and the Appendices hereto
- (b) Letter of Bid and Price Schedules submitted by the Contractor
- (c) General Conditions
- (d) Specification
- (e) Drawings
- (f) Other completed bidding forms submitted with the Bid
- (g) Any other documents forming part of the Employer's Requirements
- (h) Any other documents shall be added here

1.2 Order of Precedence (Reference GC Clause 2)

In the event of any ambiguity or conflict between

the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

**Article 2.
Contract Price
and Terms of
Payment**

2.1 Contract Price (Reference GC Clause 11)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of: _____, _____ as specified in Price Schedule No. 5 (Grand Summary), and _____, _____, or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment (Reference GC Clause 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in the Appendix (Terms and Procedures of Payment) hereto.

**Article 3.
Effective Date**

3.1 Effective Date (Reference GC Clause 1)

The Effective Date from which the Time for Completion of the Facilities shall be counted is the date of issuance of Letter of Acceptance.

**Article 4.
Communications**

4.1 The address of the Employer for notice purposes, pursuant to GC 4.1 is: _____.

4.2 The address of the Contractor for notice purposes, pursuant to GC 4.1 is: _____.

**Article 5.
Appendices**

5.1 The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

5.2 Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Employer

[Signature]

[Title]

in the presence of _____

Signed by, for and on behalf of the Contractor

[Signature]

[Title]

in the presence of _____

APPENDICES

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Appendix 1

Terms and Procedures of Payment

In accordance with the provisions of GC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on Price Schedules. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the Parties.

i) Advance

10% of the Contract Price shall be paid within thirty (30) days of the signing of agreement on presentation of commercial invoices, performance security as per clause 13.3 and an irrevocable bank guarantee equivalent to 120% of advance, valid up to the date of issue of Operational acceptance certificate. The bank Guarantee, to be produced on the Performa acceptable to SAPDC.

The bank Guarantee for the advance payment shall be in favour of the SAPDC from a Bank acceptable to the Employer. The advance shall bear a simple interest at the rate: **-For NPR & Foreign Currency (INR); 10.40 % based on SBI India, MCLR published on 15.01.2023 which includes 200 points on MCLR and as further amended by SBI time to time.**

a) The advance payments plus interest accrued thereupon shall be recovered through pro-rata deductions from Interim Payment Certificate/ RA bill certified by Engineer in Charge as per following:

The recovery of principal shall commence in the next Interim Payment Certificate/ RA Bills following that in which the total of all gross value of Interim Payment Certificates has reached 20 (twenty) percent of the Accepted Contract Amount and shall be made on pro-rata basis of advance released from the gross payment of all Interim Payment Certificates /RA Bills until such time as the advance payment has been repaid. Always provided that the advance payment shall be completely repaid prior to the time when 80 percent of the Accepted Contract Amount has been certified for payment. The gross payment shall mean and include the payment towards scheduled items, extra items, deviated items, along with substituted items including price adjustments for the purpose of this Sub Clause only.

The interest shall be calculated on the outstanding amount of principal at the close of each month. The recovery of the interest

shall commence in the next Interim Payment Certificate/RA bill following that in which the total of all gross Interim Payment Certificates/RA bills has reached 10% of the Accepted Contract Amount. Interest as accrued/accruing till the time total gross payment reaches 20 % of the Accepted Contract Amount shall be recovered from the monthly Interim Payment Certificate/RA bill in suitable instalments in such a way that the above said interest is fully recovered by the time the Contractor receives a total gross payment equivalent to 20% of the Accepted Contract Amount and thereafter, the interest as may be due on 1st day of each month will be recovered from the Interim Payment Certificates/RA Bills of the Contractor to be paid during that month. If for any reason, the payment due is insufficient to recover the full interest and principal together, interest shall be credited/recovered first and the residual applied to the principal. However, in case, full interest itself cannot be recovered, the balance amount of unrecovered interest shall also carry the same interest rate as specified in Sr. no. (i) under "Appendix-1

The Contractor shall always have the option to limit the drawl of advance to the extent desired and to have the recoveries commenced and/or completed earlier and/or have recoveries effected in instalments of higher amounts and also to repay part or whole of the advance by direct payment rather than through Interim Payment Certificates/RA bills.

b)Should there arise any occasion under the Contract due to which the periods of validities of Bank Guarantees as may have been furnished by the Contractor from time to time, are required to be extended/renewed, the Contractor shall at his cost get the validity periods of such guarantees extended/renewed, and furnish these to the Engineer in charge one month before the expiry date of the aforesaid Guarantees originally furnished; failing which the existing Bank Guarantees shall be invoked by the Engineer in charge.

c)If the advance payment has not been repaid prior to the issue of the Operational Acceptance Certificate for the Works or prior to termination under GC Clause 42 [Termination], GC Clause 41[Suspension], GC Clause 37 [Force Majeure] or GC Clause 38 [War Risk] (as the case may be), the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Employer.

ii)a Supply Portion -On despatch of Plant from Manufacturer's works:-

Up to eighty percent 80% of the contract price of Ex-works component of Plant for each identified equipment upon dispatch of equipment from manufacture's works on pro-rata basis shall be paid as progressive payment within thirty (30) days on production of the following in bound folders:

- 1) Application for payment in the standard format of the Employer.
- 2) Submission of documentary evidence towards Despatch of Plant.
- 3) Supplier invoice showing item description, quantity, unit rate and total amount.
- 4) Packing list identifying contents of each package.
- 5) Material dispatch clearance certificate (MDCC) issued by the employer prior to effecting dispatch or its waiver by employer.
- 6) Factory Inspection Report.
- 7) Submission of Insurance cover for one hundred ten percent (110%) CIF value of BoQ item dispatched duly endorsed by the insurance company.
- 8) Manufacturer guarantee certificate.
- 9) Certificate from the contractor that storage and presentation arrangement at project site are made readily will be made by the time material will arrive at project site.
- 10) Indemnity bond on employer's approved format.

ii)b Supply portion:

The 10 % payment of Supply portion shall be paid after successful erection within thirty (30) days on production of the following in bound folder:

1. Application for payment in the standard format of the Employer
2. Site Inspection Report
3. Manufacturer guarantee certificate
4. Commercial Invoice

iii) Erection Testing and Commissioning (Services Portion).

Up to ninety percent 90% of the Contract Price of transportation,

Insurance etc. on receipt of Plant at site shall be paid as progressive payment within thirty (30) days. Insofar as erection and commissioning are concerned 90% of the corresponding contract price shall be paid in monthly instalment against pro-rata contract price of the work completed and certified by the EIC.

iv) On Operational acceptance

The balance payment of contract price shall be paid after successful erection, testing and commissioning and within 60 days after the issue of Operational Acceptance certificate by the EIC.

Appendix 2

Price Adjustment

Price Adjustment

Prices payable to the Contractor, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of labour and material components, in accordance with the following principles and procedure:-

- a) Price adjustment shall apply for work carried out within the stipulated time or extension granted by the SAPDC for delay attributable to SAPDC and shall not apply to work carried out beyond the stipulated time.
- b) Price adjustment shall be applied only if the resulting increase or decrease is more than 3% (three percent) of the contract price and the total adjustment under this clause shall be subject to a ceiling plus or minus 20% (twenty percent) of the contract price.
- c) No price adjustment shall be payable on the portion of the Contract price paid to the Contractor as an advance payment.
- d) The price adjustment shall be determined during each quarter in accordance with the formulae as detailed herein after:

1.1.0 Formulae for Price adjustment

1.1.1 For Supply portion

$$HM_t = HM_0 \left\{ F + s \times \frac{S_1}{S_0} + l \times \frac{L_1}{L_0} \right\} - HM_0$$

HM_t = Adjustment price component expressed in the currency of the contract payable to the contractor for each shipment/dispatch.

HM_0 = Ninety Percent (90%) of Contract price (in case no advance is taken by the contractor) for the equipment/materials of the Contract shipment/dispatch wise.

HM_0 = Eighty Percent (80%) of Contract price (in case 10% advance is taken by the contractor) for the equipment/materials of the Contract shipment/dispatch wise.

‘F’ = Fixed portion of the contract price which will not be subjected to any adjustment.

‘s’ = Coefficient weightage of Steel content in the cost of work.

‘l’ = Coefficient weightage of labour content in the cost of work.

‘S’ = Index for Steel

Index Numbers of Wholesale prices in India - by Groups & Sub-Groups (Base: 2011-12=100) Published by Economic Advisor, Ministry of Industry/ Govt. of India under the head ‘Basic Metals, Alloys & Metal Products’ and Sub- head ‘Basic Metals & Alloys, : Steel Flat’.

‘L’ = Labour Index (depending upon the country of origin)

Consumer Price Index Numbers for Industrial workers - All - India (Base: 2011-12=100) Published by Labour Bureau, Ministry of Labour, Govt. of India.

OR

Consumer Price Index Numbers for Industrial Workers – *National salary & wage index for construction labours (Base: 2014/15 = 100) issued by Nepal Rastra Bank.*

Sub-Script:

‘0’ = Refers to index as on 28 days prior to last date for submission of price bids.

“1” = Refers to index as applicable to the date of adjustment.

The date of adjustment shall be the mid-point of the period of manufacture of Plant, as per the agreed Programme.

1.1.2 For Services portion

The price component for any erection portion of installation work comprises a fixed portion and variable portion linked with the index of labour (description and co-efficient as enumerated).

The monthly price adjustment amount for the erection portion of installation price component of the Contract Price will be computed to expatriate supervision/labour as per the formula given below:

$$HMS = HMS_1 - HMS_0$$

Where HMS_1 will be computed as follows:

$$HMS_1 = HMS_0 \left\{ F + l \times \frac{L_1}{L_0} \right\}$$

Where:

HMS = Adjustment to Erection portion of installation component of contract price payable to the contractor for each billing.

HMS_1 = Adjusted amount payable to the Contractor of Erection portion of Installation component of Contract Price.

HMS_0 = Value of the Erection work done in the billing period, which shall be calculated as under:

For the purpose of computing HMS_0 , each erection bill (which is excluding initial Advance and amount payable on completion of the Facilities and on successful completion of guarantee Test) during the Erection period upto the ‘Completion of the Facilities’ shall be divided by a factor as indicated below :

$$\left\{ \begin{array}{l} \text{Erection Portion of} \\ \text{installation} \\ \text{component of the Contract Price} \end{array} \right\} - \left\{ \begin{array}{l} \text{(Initial Advance amount + Erection} \\ \text{Portion of Installation component} \\ \text{of the Contract price payable on} \\ \text{completion of the Facilities +} \\ \text{Erection Portion of Installation} \\ \text{component of the Contract Price} \\ \text{payable on successful completion} \\ \text{of guarantee test} \end{array} \right\}$$

Erection Portion of Installation component of the Contract Price

The payment of price adjustment amount so computed shall be made against a separate invoice, linking the corresponding invoice for Erection Portion of Installation payment after retaining the pro-rata amount due on

completion of the Facilities and on Completion of the Guarantee Test. The amounts so retained shall be paid on completion of the Facilities and on successful completion of Guarantee Test respectively.

‘F’ = Fixed portion of the contract price which will not be subjected to any adjustment.

‘I’ = Coefficient weightage of labour content in the cost of work.

L’ = Labour Index

Consumer Price Index Numbers for Industrial Workers – *National salary & wage index for construction labours(Base: 2014/15 = 100) issued by Nepal Rastra Bank.*

Sub-Script:

‘0’ = Refers to index as on 28 days prior to last date for submission of price bids.

“1” = Refers to index as applicable to the date of adjustment.

The date of adjustment shall be the mid-point of the period of erection/installation of Plant, as per the agreed Programme.

At the end of each quarter defined by the months March, June, September and December of each year, the contractor shall submit to the EIC, a claim, if any, on account of price adjustment for the completed quarter in accordance with the provisions of contract.

1.1.3 Weightages for Price Adjustment Formula

Components	Fixed	Steel	Labour (Skilled)
	F	s	I
HM supply	0.15	0.50	0.35
HM erection and other Services	0.15	--	0.85

Appendix 3

Insurance Requirements

Insurances to be Taken Out by the Contractor

In accordance with the provisions of GC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

(a) Cargo Insurance

Covering loss or damage occurring while in transit from the supplier's or manufacturer's works or stores until arrival at the Site, to the Facilities (including spare parts therefor) and to the construction equipment to be provided by the Contractor or its Subcontractors. The contractor shall ensure the endorsement of dispatched facility/equipment from the Insurance company.

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to completion of the Facilities, with extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the defect liability period while the Contractor is on the Site for the purpose of performing its obligations during the defect liability period.

Amount	Deductible limits	Parties insured	From	To
	0.5 % of sum insured subject to minimum of INR 6,00,000.	SAPDC, Contractor & Sub-contractor/Manufacturer if any.		

The contractor shall ensure to submit the draft of the policy for acceptance of the EIC and any clause in insurance policy which is considered necessary for the works/facility shall be included in the policy.

Further, EIC may also request for inclusion of name of Lender as beneficiary in case claim is arises in the said policy. The wording of the same shall be "Loss payee is made in favour of M/s State Bank of India. In the event the claims being made under the policy, a form of discharge signed by an authorized representative of M/s SBI, acting as facility agent for the benefit of various lenders shall be accepted as

valid discharge on behalf of other parties interested in the insurance policy. All amount agreed in a settlement of such claims shall be routed through a separate account advised by M/s State Bank of India acting as facility agent for the benefit of various lenders. For this clause, M/s State Bank of India as facility agent shall be treated as having a first charge on insurance contracts.

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities that have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities. Such Insurance shall be effected for an amount equivalent to at least INR 15 (Fifteen) Million for any one loss on reinstatement basis but in total not exceeding INR 90 (Ninety) Million.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Third Party Liability and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Cargo and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

Insurances To Be Taken Out By The Employer: NIL

Appendix 4

TIME SCHEDULE & LD MILESTONES FOR PRESSURE SHAFTS STEEL LINER WORKS OF ARUN-3 HEP

Time Schedule

The Time for Completion of Contract is 9 (nine) months reckoned from commencement date.

LD Milestones

Sr. No.	Description	Milestone
1	Pressure Shaft Steel Liner	Placement of order (50 % of total quantity of supply portion for ASTM A 537 Class-II and ASTM A 517 Gr-F) for procurement of steel plate within thirty (30) days of award of work.
2	Pressure Shaft Steel Liner	Receiving of steel plate (50 % of total quantity of supply portion for ASTM A 537 Class-II and ASTM A 517 Gr-F) within Four (04) month of award of work at contractor fabrication workshop.
3	Pressure Shaft Steel Liner	Supply of Fabricated & shop tested steel liner (100 % quantity of ASTM A 537 Class-II & ASTM A 517 Gr-F) for Pressure Shaft Steel Liner within 8 months of award of works.
4	Pressure Shaft Steel Liner	Erection& testing of each pressure Shaft up to Lower bend (EL-525.00) within 8 months after handing over by Civil Contractor.
5	Pressure Shaft Steel Liner	Erection & testing of complete pressure shaft including bifurcation & branches after respective lower bend within 8 months after handing over by civil contractor.

Appendix 5

Deleted

Appendix 6

Scope of Works and Supply by the Employer

Scope of Works is as specified in Technical Specifications & Employer shall provide sufficient, properly qualified operating and maintenance personnel and other assistance as delineated under GC clause 10 and 24. Unless otherwise indicated, all personnel and assistance mentioned above will be provided free of charge to the Contractor.

Appendix 7

List of Documents for Review

Pursuant to GCC Sub-Clause 20.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the EIC in accordance with the requirements of GCC Sub-Clause 18.2 (Program of Performance) for review of Employer/EIC, the following documents for:-

Sr. No.	Documents
1.	Design calculations/ drawings
2.	Safety procedure
3.	Machinery imposed loads.
4.	Working Schedules
5.	Method statements for manufacturing and installations
6.	Quality Assurance Programme for workshop and construction site.
7.	Detailed specifications for bought out items
8.	Logistics for heavy, voluminous and critical components
9.	Erection, testing and commissioning procedures
10.	Painting systems
11.	Deleted without change in Sr. No.
12.	Formats for inspection, tests and test results.
13.	Operation and maintenance manuals.
14.	List of special tools, tackles and testing instruments.
15.	As-Built Drawings.
16.	Catalogue of bought out items.
17.	Progress Reports.
18.	Final Inspection Reports at workshop and construction site
19.	Workshop Test Schedules.
20.	Site Test Schedules
21.	Spare Parts List
22.	Copy of relevant softwares/programmes
23.	Commissioning documents
24.	Manufacturing history records (MHR)

The above list of document is not exhaustive, however the bidder shall have to submit the documents as per relevant clauses of bid documents and as advised by the Employer.

Appendix 8

Deleted

Appendix-9

Determination of Idling Time cost Claims

The idling time cost claims resulting from extension of Time for Completion under GC 40.1 (c) and (e) shall be determined as under:-

1. Cost of owned/ hired/ leased Equipment

Cost of owned/ hired/ leased equipment will comprise of the following elements:-

i. Depreciation Cost.

$$\begin{aligned} \text{Annual Depreciation} &= 0.9 \times \text{Book Value/Life in years.} \\ \text{(Based on life in years)} \end{aligned}$$

$$\text{Depreciation cost} = \{(\text{Idle period in days}/365) \times 0.5 \times \text{Annual Depreciation}\}.$$

However, if the equipment, as considered above, have completed their scheduled life in years in that case the depreciation shall be considered as zero.

ii. Interest on capital Investment: $(\text{Rate of Interest}\#/100) \times \text{Average Annual Cost}$

The average annual cost is to be determined as follows:-

$$\text{Average Annual Cost} = \text{Book value of Equipment} \times (n+1)/2n$$

Where:

- “n” refer for number in years of life of equipment (as per the latest guidelines of Central Water Commission India)
- Book value = purchase price plus freight, insurance, all taxes and duties, port clearance charges, erection and commissioning charges and other incidental charges.

the interest rate shall be at the rate of **10%** per annum.

2. Cost of Labour

The labour directly engaged for the works at Site by the Contractor or through sub-contractor, will be reimbursed for idle period in case contractor produces proof that idle labour has been paid wages during the period of idling. Cost of equipment related labour, will be worked out as per CWC norms limited to actual whichever is lower.

The above cost will be considered for payment based on the supporting details such as attendance sheet, receipt of deposit of Employees provident fund/ Employee Social Security fund duly certified by the Contractor.

In addition to actual cost of labour, indirect charges shall be considered. The indirect charges (other than salary) shall be 55% for skilled and unskilled labour. Indirect charges shall be applicable on the basic wages. Basic wages means component of wages on which statutory deductions like Employee Provident Fund is deposited to the statutory authority.

3. Bank Guarantees and Insurance charges

These charges shall be paid beyond Scheduled completion period on authorized extension of completion period upon production of documentary evidence.

4. Expenses on additional storage / preservation / transportation / double handling

Against submission of documentary evidence as per actual.

5. Overhead

Overhead costs include but not limited to Office and share of head office expenses charges, General establishment, Watch and Ward, Local convey Travelling e Social welfare, salaries of Managerial and clerical staff etc. and Publicity etc.

Overhead Charges	=	2% of Contract price × authorized Time Extension
		entitling cost claim/ Contractual Construction Period

The lump-sum component of overhead as 2% shall cover all other charges included expressly in any of the items of claim at Sl. 1 to 4 as above.

6. The taxes applicable on cost claims

The applicable taxes on the above elements of cost claims shall be reimbursed to the Contractor as per actual based on documentary evidence.

4. Performance Security Form – *Bank Guarantee*¹

Beneficiary: _____

Date: _____

PERFORMANCE GUARANTEE No.: _____

We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with you, for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we _____ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of _____ (____)², upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall be reduced by half upon our receipt of:

- (a) a copy of the Operational Acceptance Certificate; or
- (b) a registered letter from the Contractor (i) attaching a copy of its notice requesting issuance of the Operational Acceptance Certificate and (ii) stating that the EIC has failed to issue such Certificate within the time required or provide in writing justifiable reasons why such Certificate has not been issued, so that Operational Acceptance is deemed to have occurred.

This guarantee shall expire no later than the earlier of:³

¹ *The Employer should insert either the Bank Guarantee (4.1) or the Conditional Guarantee (4.2).*

² The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the *Employer*.

³ This text shall be revised as and where necessary to take into account (i) partial acceptance of the Facilities in accordance with Sub-Clause 25.4 of the GCC; and (ii) extension of the performance

-
- (a) twelve months after our receipt of either (a) or (b) above; or
 - (b) eighteen months after our receipt of:
 - (i) a copy of the Completion Certificate; or
 - (ii) a registered letter from the Contractor, attaching a copy of the notice to the EIC that the Facilities are ready for commissioning, and stating that fourteen days have elapsed from receipt of such notice (or seven days have elapsed if the notice was a repeated notice) and the EIC has failed to issue a Completion Certificate or inform the Contractor in writing of any defects or deficiencies; or
 - (iii) a registered letter from the Contractor stating that no Completion Certificate has been issued but the Employer is making use of the Facilities; or
 - (c) the ____ day of _____, 2____.⁴

Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

[signature(s)]

security when the Contractor is liable for an extended warranty obligation pursuant to Sub-Clause 27.10 of the GCC (although in this latter case the *Employer* might want to consider an extended warranty security in lieu of the extension of the performance security).

⁴ Insert the date twenty-eight days after the expected expiration date of the Defect Liability Period. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”

5. Bank Guarantee Form for Advance Payment

Beneficiary: _____

Date: _____

ADVANCE PAYMENT GUARANTEE No.: _____

We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with you, for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum of _____ (_____) is to be made against an advance payment guarantee.

At the request of the Contractor, we _____ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than toward the execution of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on his account number _____ at _____.

The maximum amount of this guarantee is valid shall be progressively reduced in proportion to the value of each part-shipment or part-delivery of plant and equipment to the site, as indicated in copies of the relevant shipping and delivery documents that shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of documentation indicating full repayment by the Contractor of the amount of the advance payment, or on the ___ day of _____, 2____, whichever is earlier.⁵ Consequently, any demand for payment under

⁵ Insert the expected expiration date of the Time for Completion. The *Employer* should note that in the event of an extension of the time for completion of the Contract, the *Employer* would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the *Employer*

this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[signature(s) name of bank or financial institution]

might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the *Employer*’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”

6. Form of Completion Certificate

Date: _____

DCB No.: _____

[Name of Contract]

To: *[Name and address of Contractor]*

Dear Ladies and/or Gentlemen,

Pursuant to GC Clause 24 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the *Employer* dated *[date]*, relating to the *[brief description of the Facilities]*, we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below.

1. Description of the Facilities or part thereof: *[description]*
2. Date of Completion: *[date]*

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

Title
(EIC)

7. Form of Operational Acceptance Certificate

Date: _____

NCB No.: _____

[Name of Contract]

To: *[Name and address of Contractor]*

Dear Ladies and/or Gentlemen,

Pursuant to GC Sub-Clause 25.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the *Employer* dated *[date]*, relating to the *[brief description of the Facilities]*, we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below, and that, in accordance with the terms of the Contract, the *Employer* hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the Facilities or part thereof: *[description]*
2. Date of Operational Acceptance: *[date]*

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

Title
(EIC)

8. Change Order Procedure and Forms

Date: _____

NCB No.: _____

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Change Order Procedure

1. General

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with GC Clause 39 (Change in the Facilities) of the General Conditions.

2. Change Order Log

The Contractor shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Changes authorized or pending, as Annex 8. Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the *Employer*.

3. References for Changes

- (1) Request for Change as referred to in GC Clause 39 shall be serially numbered CR-X-*nnn*.
- (2) Estimate for Change Proposal as referred to in GC Clause 39 shall be serially numbered CN-X-*nnn*.
- (3) Acceptance of Estimate as referred to in GC Clause 39 shall be serially numbered CA-X-*nnn*.
- (4) Change Proposal as referred to in GC Clause 39 shall be serially numbered CP-X-*nnn*.
- (5) Change Order as referred to in GC Clause 39 shall be serially numbered CO-X-*nnn*.

Note: (a) Requests for Change issued from the *Employer's* Home Office and the Site representatives of the *Employer* shall have the following respective references:

Home Office	CR-H- <i>nnn</i>
Site	CR-S- <i>nnn</i>

- (b) The above number "*nnn*" is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal and Change Order.

Annex 1. Request for Change Proposal

(*Employer's Letterhead*)

To: *[Contractor's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within *[number]* days of the date of this letter *[or on or before (date)]*.

1. Title of Change: *[Title]*
2. Change Request No./Rev.: *[Number]*
3. Originator of Change: *Employer: [Name]*
Contractor (by Application for Change Proposal No. *[Number]*)⁶:
4. Brief Description of Change: *[Description]*
5. Facilities and/or Item No. of equipment related to the requested Change: *[Description]*
6. Reference drawings and/or technical documents for the request of Change:

<u>Drawing No./Document No.</u>	<u>Description</u>
---------------------------------	--------------------

7. Detailed conditions or special requirements on the requested Change: *[Description]*
8. General Terms and Conditions:

- (a) Please submit your estimate to us showing what effect the requested Change will have on the Contract Price.
- (b) Your estimate shall include your claim for the additional time, if any, for completion of the requested Change.
- (c) If you have any opinion negative to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract or the safety of the Plant or Facilities, please inform us of your opinion in your proposal of revised provisions.
- (d) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.
- (e) You shall not proceed with the execution of the work for the requested Change until we have accepted and confirmed the amount and nature in writing.

(Employer's Name)

(Signature)

(Name of signatory)

(Title of signatory)

Annex 2. Estimate for Change Proposal

(Contractor's Letterhead)

To: *[Employer's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost of preparing the below-referenced Change Proposal in accordance with GC Sub-Clause 39.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GC Sub-Clause 39.2.2, is required before estimating the cost for change work.

1. Title of Change: *[Title]*
2. Change Request No./Rev.: *[Number]*
3. Brief Description of Change: *[Description]*
4. Scheduled Impact of Change: *[Description]*
5. Cost for Preparation of Change Proposal: *[Cost]*⁷

(a) Engineering	(Amount)
(i) Engineer _____ hrs x _____ rate/hr =	_____
(ii) Draftsperson _____ hrs x _____ rate/hr =	_____
Sub-total _____ hrs	_____
Total Engineering Cost	_____
(b) Other Cost	_____
Total Cost (a) + (b)	_____

⁷ Costs shall be in the currencies of the Contract.

(Contractor's Name)

(Signature)

(Name of signatory)

(Title of signatory)

Annex 3. Acceptance of Estimate

(Employer's Letterhead)

To: *[Contractor's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change: *[Title]*
2. Change Request No./Rev.: *[Request number/revision]*
3. Estimate for Change Proposal No./Rev.: *[Proposal number/revision]*
4. Acceptance of Estimate No./Rev.: *[Estimate number/revision]*
5. Brief Description of Change: *[Description]*
6. Other Terms and Conditions: In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparation of Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GC Clause 39 of the General Conditions.

(Employer's Name)

(Signature)

(Name and Title of signatory)

Annex 4. Change Proposal

(Contractor's Letterhead)

To: *[Employer's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

In response to your Request for Change Proposal No.*[Number]*, we hereby submit our proposal as follows:

1. Title of Change: *[Name]*
2. Change Proposal No./Rev.: *[Proposal number/revision]*
3. Originator of Change: *Employer: [Name]*
 Contractor: [Name]
4. Brief Description of Change: *[Description]*
5. Reasons for Change: *[Reason]*
6. Facilities and/or Item No. of Equipment related to the requested Change: *[Facilities]*
7. Reference drawings and/or technical documents for the requested Change:

<u>Drawing/Document No.</u>	<u>Description</u>
-----------------------------	--------------------

8. Estimate of increase/decrease to the Contract Price resulting from Change Proposal:⁸

(Amount)

(a) Direct material

⁸ Costs shall be in the currencies of the Contract.

-
- (b) Major construction equipment _____
- (c) Direct field labor (Total hrs) _____
- (d) Subcontracts _____
- (e) Indirect material and labor _____
- (f) Site supervision _____
- (g) Head office technical staff salaries

Process engineer	_____ hrs @ _____ rate/hr	_____
Project engineer	_____ hrs @ _____ rate/hr	_____
Equipment engineer	_____ hrs @ _____ rate/hr	_____
<hr/>		
Procurement	_____ hrs @ _____ rate/hr	_____
Draftsperson	_____ hrs @ _____ rate/hr	_____
Total	_____ hrs	_____

- (h) Extraordinary costs (computer, travel, etc.) _____
- (i) Fee for general administration, _____ % of Items

- (j) Taxes and customs duties _____

Total lump sum cost of Change Proposal _____
[Sum of items (a) to (j)]

Cost to prepare Estimate for Change Proposal _____
[Amount payable if Change is not accepted]

9. Additional time for Completion required due to Change Proposal
10. Effect on the Functional Guarantees
11. Effect on the other terms and conditions of the Contract
12. Validity of this Proposal: within [Number] days after receipt of this Proposal by the *Employer*
13. Other terms and conditions of this Change Proposal:
- (a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within [Number] days from your receipt of this Proposal.

- (b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.

- (c) Contractor's cost for preparation of this Change Proposal:²
(Note) *This cost shall be reimbursed by the Employer in case of Employer's withdrawal or rejection of this Change Proposal without default of the Contractor in accordance with GC Clause 39 of the General Conditions.*

(Contractor's Name)

(Signature)

(Name of signatory)

(Title of signatory)

² Specify where necessary.

Annex 5. Change Order

(Employer's Letterhead)

To: *[Contractor's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We approve the Change Order for the work specified in the Change Proposal (No. *[Number]*), and agree to adjust the Contract Price, Time for Completion and/or other conditions of the Contract in accordance with GC Clause 39 of the General Conditions.

1. Title of Change: *[Name]*

2. Change Request No./Rev.: *[Request number/revision]*

3. Change Order No./Rev.: *[Order number/revision]*

4. Originator of Change: *Employer: [Name]*
 Contractor: [Name]

5. Authorized Price:

Ref. No.: *[Number]*

Date: *[Date]*

Foreign currency portion *[Amount]* plus Local currency portion
[Amount]

6. Adjustment of Time for Completion

None
 days

Increase *[Number]* days

Decrease *[Number]*

7. Other effects, if any

Authorized by: _____
 (Employer)

Date: _____

Accepted by: _____
 (Contractor)

Date: _____

Annex 6. Pending Agreement Change Order

(Employer's Letterhead)

To: *[Contractor's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We instruct you to carry out the work in the Change Order detailed below in accordance with GC Clause 39 of the General Conditions.

1. Title of Change: *[Name]*
2. *Employer's* Request for Change Proposal No./Rev.:
[Number/revision] dated:
[Date]
3. Contractor's Change Proposal No./Rev.: *[Number/revision]* dated:
[Date]
4. Brief Description of Change: *[Description]*
5. Facilities and/or Item No. of equipment related to the requested Change: *[Facilities]*
6. Reference Drawings and/or technical documents for the requested Change:

<u>Drawing/Document No.</u>	<u>Description</u>
-----------------------------	--------------------

7. Adjustment of Time for Completion:
8. Other change in the Contract terms:
9. Other terms and conditions:

(Employer's Name)

(Signature)

(Name of signatory)

(Title of signatory)

Annex 7. Application for Change Proposal

(Contractor's Letterhead)

To: *[Employer's name and address]*

Date: _____

Attention: *[Name and title]*

Contract Name: *[Contract name]*

Contract Number: *[Contract number]*

Dear Ladies and/or Gentlemen:

We hereby propose that the below-mentioned work be treated as a Change in the Facilities.

1. Title of Change: *[Name]*
2. Application for Change Proposal No./Rev.: *[Number/revision]*
dated:
[Date]
3. Brief Description of Change: *[Description]*
4. Reasons for Change:
5. Order of Magnitude Estimation (in the currencies of the Contract):
6. Scheduled Impact of Change:
7. Effect on Functional Guarantees, if any:
8. Appendix:

(Contractor's Name)

(Signature)

(Name of signatory)

(Title of signatory)

Annex-8 . Integrity Pact & Under Taking

Between

SJVN Arun-3 Power Development Company (P) Ltd. (SAPDC), a company incorporated under the Companies Act 2063 and having its registered office at Lokanthali, Kathmandu, Nepal, hereinafter referred to as “The Employer” which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns of the **First Part.**

And

M/s....., a company/ firm/ individual (status of the company) constituted in accordance with the relevant law in the matter and having its registered office at represented by Sh.Prop. hereinafter referred to as “The Bidder/Contractor” which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns of the **Second Part.**


WHEREAS the Employer proposes to procure under laid down organizational procedures, contract for “Hydro-mechanical Works -Pressure Shaft Steel Liner of Arun-3 HEP.” And the Bidder/contractor is willing to offer against TENDER NO/REF.: ICB-P&C-AHEP-HM-C-5/2023-90 dated 10.02.2023.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the Employer to obtain the desired said (work/ goods/ services) at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling the Bidder(s)/Contractor(s) to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the Employer will commit to prevent corruption, in any form, by its officials by following transparent procedures.



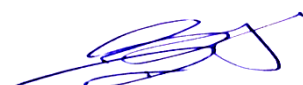
1.0 Commitments of the Employer

- 1.1 The Employer undertakes that no official of the Employer, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the Bidder/Contractor, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
- 1.2 The Employer will, during the pre-contract stage, treat all the Bidders/Contractors alike, and will provide to all the Bidders/Contractors the same information and will not provide any such information to any particular Bidder/Contractor which could afford an advantage to that particular Bidder/Contractor in comparison to other Bidders/Contractors.
- 1.3 All the officials of the Employer will report to the appropriate Authority any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
- 1.4 In case any such preceding misconduct on the part of such official(s) is reported by the Bidder to the Employer with full and verifiable facts and the same is prima facie found to be correct by the Employer, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the Employer or Independent External Monitor and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the Employer the proceedings under the contract would not be stalled.

2.0 Commitments of the Bidder(s)/Contractor(s)

The Bidder(s)/Contractor(s) commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following :-

- 2.1 The Bidder(s)/Contractor(s) will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Employer, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
- 2.2 The Bidder/Contractor further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or



inducement to any official of the Employer or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with Employer for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with Employer.

- 2.3 The Bidder(s)/Contractor(s) shall disclose the name and address of agents and representatives and Indian Bidder(s)/Contractor(s) shall disclose their foreign principals or associates.
- 2.4 The Bidder(s)/Contractor(s) shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract
- 2.5 The Bidder, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the Employer or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 2.6 The Bidder/Contractor will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
- 2.7 The Bidder/Contractor will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 2.8 The Bidder/Contractor shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the Employer as part of the business relationship, regarding plans, technical proposals and business details, including information contained in electronic data carrier. The Bidder/Contractor also undertakes to exercise due and adequate care lest any such information is divulged.
- 2.9 The Bidder(s)/Contractor(s) commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 2.10 The Bidder(s)/Contractor(s) shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 2.11 If the Bidder/Contractor or any employee of the Bidder/Contractor or any person acting on behalf of the Bidder/Contractor, either directly or indirectly, is a relative of any of the officers of the Employer, or alternatively, if any relative of an officer of the Employer has financial interest/stake in the Bidder(s)/Contractor(s) firm (excluding Public Ltd. Company listed on Stock Exchange), the same shall be disclosed by the Bidder/Contractor at the time of filling of tender.



The term ‘relative’ for this purpose would be as defined in Section 2(77) of the Companies Act, 2013 (India).

2.12 The Bidder(s)/Contractor(s) shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the Employer.

2.13 The Bidder/supplier shall follow all rules and regulations of **India and/or Nepal**.

3.0 Previous Transgression

3.1 The Bidder(s)/Contractor(s) declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect on any corrupt practices envisaged hereunder or with any Public Sector Enterprise / Government Department in India and in Nepal (*Employer’s country*).

3.2 The Bidder agrees that if it makes incorrect statement on this subject, Bidder can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

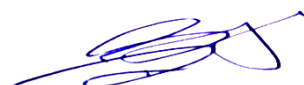
4.0 Earnest Money (Security Deposit)

The provision regarding Earnest Money/Security Deposit as detailed in the Notice Invitation Tender (NIT)/Instruction to Bidders (ITB) of the tender document is to be referred.

5.0 Sanctions for Violations

5.1 Any breach of the aforesaid provisions by the Bidder/Contractor or any one employed by it or acting on its behalf shall entitle the Employer to take action as per the procedure mentioned in the “**Guidelines on Banning of Business Dealings**” attached as **Annex-A** and initiate all or any one of the following actions, wherever required:-

- (i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the Bidder/Contractor. However, the proceedings with the other Bidder(s)/Contractor(s) would continue.
- (ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is Signed) shall stand forfeited either fully or partially, as decided by the Employer and the Employer shall not be required to assign any reason thereof.
- (iii) To immediately cancel the contract, if already signed, without giving any compensation to the Contractor. The Bidder/Contractor shall be liable to pay compensation for any loss or damage to the Employer resulting from such cancellation/rescission and the Employer shall be entitled to deduct the amount



- so payable from the money(s) due to the Bidder/Contractor.
- (iv) To encash the Bank guarantee, in order to recover the dues if any by the Employer, along with interest as per the provision of contract.
 - (v) To debar the Bidder/Contractor from participating in future bidding processes of Employer, as per provisions of “Guidelines on Banning of Business Dealings” (**Annex-A**), which may be further extended at the discretion of the Employer.
 - (vi) To recover all sums paid in violation of this Pact by Bidder(s)/Contractor(s) to any middleman or agent or broker with a view to securing the contract.
 - (vii) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the Employer with the Bidder/ Contractor, the same shall not be opened/operated.
 - (viii) Forfeiture of Performance Security in case of a decision by the Employer to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

- 5.2 The Employer will be entitled to take all or any of the actions mentioned at para 6.1 (i) to (viii) of this Pact also on the Commission by the Bidder/Contractor or any one employed by it or acting on its behalf (whether with or without the knowledge of the Bidder/Contractor), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption in Employer’s country.
- 5.3 The decision of the Employer to the effect that a breach of the provisions of this Pact has been committed by the Bidder/Contractor shall be final and conclusive on the Bidder/Contractor. However, the Bidder/Contractor can approach the Independent External Monitor(s) appointed for the purposes of this Pact.

6.0 Independent External Monitor(s)

- 6.1 The Employer has appointed Independent External Monitor(s) (hereinafter referred to as Monitors) for this Pact.
- 6.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 6.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 6.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings. The right to access records should only be limited to the extent absolutely necessary to investigate the issue related to the subject tender/contract.
- 6.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform CMD/CEO/MD of Employer and request Employer to discontinue



or take corrective action, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

- 6.6 The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction, to all Project documentation of the Employer including that provided by the Bidder/Contractor. The Bidder/Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractor(s). The Monitor shall be under contractual obligation to treat the information and documents of the Bidder/Contractor/Subcontractor(s) with confidentiality.
- 6.7 The Employer will provide to the Monitor sufficient information about all meetings among the parties related to the project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings as and when required.
- 6.8 The Monitor will submit a written report to the CMD/CEO/MD of Employer within 10 days from the date of reference or intimation to him by the Employer/Bidder and should the occasion arise, submit proposals for correcting problematic situations.
- 6.9 The word ‘Monitor’ would include both singular and plural.

7.0 Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the Employer or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Bidder/Contractor and the Bidder/Contractor shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

8.0 Law and Place of Jurisdiction

This Pact is subject to Nepal’s Law. The place of performance and jurisdiction is the Registered Office of the Employer. The arbitration clause provided in the tender document/contract shall not be applicable for any issue/dispute arising under Integrity Pact.

9.0 Other Legal Actions


- 9.1 The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.
- 9.2 Changes and supplements as well as termination notice need to be made in writing.
- 9.3 If the Contractor is a partnership or a consortium or a joint venture, this pact must be signed by all partners of the consortium/joint venture.



10.0 Validity

- 10.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the Employer and the Bidder/Contractor/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract or six months from the date of opening of price bids, whichever is earlier.
- 10.2 Should one or several provisions of this Pact turn out to be invalid, the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intention.

11.0 The Parties hereby sign this Integrity Pact at _____ on _____.

Employer 

Name of the Officer: **Rakesh Singh**

Designation: **CE (P&C)**

Place: Tumlingtar, nepal

Date-----

Witness1. _____

Bidder

(Authorised Person)

(Name of the Person)

Designation

Place-----

Date-----

Witness1. _____

(Name and address)

2. _____

(Name and address)

(Name and address)

2. _____

(Name and address)

Annex-A (with Integrity Pact)

GUIDELINES ON BANNING OF BUSINESS DEALINGS

1.0 Introduction

- 1.1 Employer deals with Agencies viz. parties/ contractors/ suppliers/ bidders, who are expected to adopt ethics of highest standards and a very high degree of integrity, commitments and sincerity towards the work undertaken. It is not in the interest of Employer to deal with Agencies who commit deception, fraud or other misconduct in the tendering process.
- 1.2 Since banning of business dealings involves civil consequences for an Agency concerned, it is incumbent that adequate opportunity of hearing is provided and the explanation, if tendered, is considered before passing any order in this regard keeping in view the facts and circumstances of the case.

2.0 Scope

- 2.1 The Information for Bidders/ Instruction to Bidders/Notice Inviting Tender/Notice Inviting Quotations and even the General Conditions of Contract (GCC) of Employer generally provide that Employer shall have the rights to remove from list of approved suppliers / contractors or to ban business dealings if any Agency has been found to have committed misconduct or fraud or anything unethical not expected from a reputed contractor.
- 2.2 The procedure of (i) Removal of Agency from the List of approved suppliers / contractors; (ii) Suspension and (iii) Banning of Business Dealing with Agencies, has been laid down in these guidelines.
- 2.3 These guidelines shall apply to all the Projects/ Power Stations/ Regional Offices/ Liaison Offices of SJVN including its subsidiaries/JVs.
- 2.4 It is clarified that these guidelines do not deal with the poor performance of the contractors/ Agencies.
- 2.5 The banning shall be with prospective effect, i.e. future business dealings.

3.0 Definitions

In these Guidelines, unless the context otherwise requires:

- i) **“Party / Contractor / Supplier / Bidders”** shall mean and include a public limited company or a private limited company, a joint Venture, Consortium, HUF, a firm whether registered or not, an individual, cooperative society or an association or a group of persons engaged in any commerce, trade, industry, etc. “Party / Contractor/ Supplier / Bidder’ in the context of these guidelines is indicated as ‘Agency’.
- ii) **“Unit” shall** mean the Project/ Power Station/ Regional Office/ Liaison Office.
- iii) **“Competent Authority” and ‘Appellate Authority’** shall mean the following:

The concerned Director shall be the ‘Competent Authority’ for the purpose of



these guidelines.

CMD, SJVN shall be the ‘Appellate Authority’ in respect of such cases.

- iv) **“Investigating Committee”** shall mean any Officer/Committee appointed by Competent Authority to conduct investigation.
- v) **“List of approved Agencies viz Parties / Contractors / Suppliers/Bidders”** shall mean and include list of Parties/ Contractors / Suppliers / Bidders etc if registered with Employer.

4.0 Initiation of Banning / Suspension

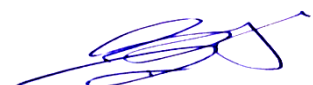
Action for banning /suspension business dealings with any Agency shall be initiated by the department responsible for invitation of bids after noticing the irregularities or misconduct on the part of Agency concerned. Besides the concerned department, Vigilance Department of each Unit/ Corporate Vigilance may also be competent to initiate such action.

5.0 Suspension of Business Dealings.

- 5.1 If the conduct of any Agency dealing with Employer is under investigation, the Competent Authority may consider whether the allegations (under investigation) are of a serious nature and whether pending investigation, it would be advisable to continue business dealing with the Agency. If the Competent Authority, after consideration of the matter including the recommendation of the Investigating Committee, if any, decides that it would not be in the interest to continue business dealings pending investigation, it may suspend business dealings with the Agency. The order of suspension would operate for a period not more than six months and may be communicated to the Agency as also to the Investigating Committee. The Investigating Committee may ensure that their investigation is completed and whole process of final order is over within such period. However, if investigations are not completed in six months time, the Competent Authority may extend the period of suspension by another three months, during which period the investigations must be completed.
- 5.2 The order of suspension shall be communicated to all Departmental Heads of SJVN including its subsidiaries and JVs and Heads of the Units. During the period of suspension, no business dealing may be held with the Agency.
- 5.3 As far as possible, the existing contract(s) with the Agency may continue unless the Competent Authority, having regard to the circumstances of the case, decides otherwise.
- 5.4 If the Agency concerned asks for detailed reasons of suspension, the Agency may be informed that its conduct is under investigation. It is not necessary to enter into correspondence or argument with the Agency at this stage.
- 5.5 It is not necessary to give any show-cause notice or personal hearing to the Agency before issuing the order of suspension.

6.0 Ground on which Banning of Business Dealings can be initiated:

- 6.1 If the security consideration, including questions of loyalty of the Agency to



Employer so warrants;

- 6.2 If the director /owner of the Agency, proprietor or partner of the firm, is convicted by a Court of Law for offences involving moral turpitude in relation to its business dealings with the Government or any other public sector enterprises, during the last three years.
- 6.3 If business dealings with the Agency have been banned by the Department of Power, Government of India and/or Ministry of Energy, Water Resources and Irrigation, Government of Nepal.
- 6.4 If the Agency has resorted to corrupt, fraudulent practices including misrepresentation of facts;
- 6.5 If the Agency uses intimidation / threatening or brings undue outside pressure on Employer or its official for acceptance / performances of the job under the contract;
- 6.6 If the Agency misuses the premises or facilities of Employer, forcefully occupies or damages Employer's properties including land, water resources, forests / trees or tampers with documents/records etc. (Note: The examples given above are only illustrative and not exhaustive. The Competent Authority may decide to ban business dealing for any good and sufficient reason).

7.0 Banning of Business Dealings

- 7.1 A decision to ban business dealings with any Agency shall apply throughout SJVN including its subsidiaries/JVs.
- 7.2 There will be an Investigating Committee consisting of officers not below the rank of AGM/DGM from Indenting Division, Finance, Law and Contracts. Member from department responsible for invitation of bids shall be the convener of the committee. The functions of the committee shall, inter-alia include:
 - i) To study the report of the unit/division responsible for invitation of bids and decide if a prima-facie case for banning exists, if not, send back the case to the Competent Authority.
 - ii) To recommend for issue of show-cause notice to the Agency by the concerned unit/division as per clause 9.1.
 - iii) To examine the reply to show-cause notice and call the Agency for personal hearing, if required.
 - iv) To submit final recommendations to the Competent Authority for banning or otherwise.

8.0 Removal from List of Approved Agencies - Suppliers/ Contractors, etc.

- 8.1 If the Competent Authority decides that the charge against the Agency is of a minor nature, it may issue a show-cause notice as to why the name of the Agency should not be removed from the list of approved Agencies - Suppliers / Contractors, etc.
- 8.2 The effect of such an order would be that the Agency would not be qualified for competing in Open Tender Enquiries or Limited Tender Enquiries till the period



mentioned in the order.

- 8.3 Past performance of the Agency may be taken into account while processing approval of the Competent Authority for award of the contract.

9.0 Show-cause Notice

- 9.1 In case where the Competent Authority decides that action against an Agency is called for, a show-cause notice has to be issued to the Agency, Statement containing the imputation of misconduct or misbehavior may be appended to the show-cause notice and the Agency should be asked to submit within 15 days a written statement in its defense.

- 9.2 If the Agency requests for inspection of any relevant document in possession of Employer, necessary facility for inspection of documents may be provided.

- 9.3 The Competent Authority may consider and pass an appropriate speaking order:
- a) For exonerating the Agency if the charges are not established;
 - b) For removing the Agency from the list of approved Suppliers / Contactors, etc.
 - c) For banning the business dealing with the Agency.

- 9.4 If it decides to ban business dealings, the period for which the ban would be operative may be mentioned.

10.0 Appeal against the Decision of the Competent Authority

- 10.1 The Agency may file an appeal against the order of the Competent Authority banning business dealing etc. The appeal shall be filed to Appellate Authority. Such an appeal shall be preferred within one month from the date of receipt of the order banning business dealing, etc.

- 10.2 Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the Agency as well as the Competent Authority.

11.0 Circulation of the names of Agencies with whom Business Dealings have been banned

- i) The concerned unit shall forward the name and details of the Agency(ies) banned to IT&C Division of SJVN's Corporate Office for displaying the same on SJVN website.
- ii) Corporate Contracts Department, SJVN shall also forward the name and details of the Agency(ies) banned to the Ministry of Power, GoI besides forwarding the name and details to the contracts/procurement group of all CPSUs of power sector.



FORM OF DECLARATION OF ELIGIBILITY
UNDERTAKING (With Integrity Pact)

We, M/s
.....hereby
certify that we have not been banned/de-listed/ black listed / debarred from business by
any PSU / Govt. Department during last 03 (three) years on the grounds mentioned in
para 6 of Guidelines on banning of Business dealing.

(Seal & signature of the Authority Signatory of bidder / Contractor)

Annex-9

BANK GUARANTEE FORMAT FOR MATERIAL ADVANCE PAYMENT

(To be executed on letter head of the Bank)

(To be stamped in accordance with Stamp Act if any, of the Country of the Issuing Bank)

Bank Guarantee

No.....

Date.....

To,

[Employer's Name & Address]

Dear Sir,

In consideration of the *[Employer's Name]*..... (hereinafter referred to as the 'Employer',

which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s.....*[Contract or's*

Name] with its Registered/Head Office at (hereinafter referred to as the 'Contractor' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a Contract,

by issue of Employer's Letter of Acceptance No. dated and the same having been acknowledged by the Contractor, resulting into a Contract bearing No.....dated.....valued at.....

for *[Name* *of Contract]*.....(hereinafter called the 'Contract') and the Employer having agreed to make an advance payment to the Contractor

for performance of the above Contract amounting (in words and figures)

as an Advance against Bank Guarantee to be furnished by the Contractor.

We.....*[Name and address of the Bank]*..... having its Head Office

at..... (hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the

Employer, immediately on demand any or, all monies payable by the Contractor to the extent of [advance amount].....

.....as aforesaid at any time upto.....(@)..... without any demur, reservation, contest, recourse

or protest and/ or without any reference to the Contractor. Any such demand made by the Employer on the Bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the guarantee herein contained shall be irrevocable and shall continue to be enforceable till the Employer discharges this guarantee. This guarantee may be progressively reduced by amount repaid by the contractor.

(**)

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time to vary the advance or to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would but for this provision have the effect of relieving the Bank.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor’s liabilities.

Notwithstanding anything contained herein:

- i) Our liability under this Bank Guarantee shall not exceed._____.
- ii) This Bank Guarantee shall be valid upto _____.
- iii) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if Employer serve upon Bank a written claim or demand on or before (@)_____

Dated this day of(month).....(year)..... at

WITNESS (Signature).....	(Signature) (Name) (Name).....
--------------------------------------	--

..... (Name) (Name)..... (Official Address) (Official Address) (Designation with Bank Stamp)/Staff Authority No. Complete Address of the Bank with Tele-Fax Dated.....

Notes: 1. (@) This date shall be ninety (90) days beyond the date of Completion of the Works.

(**) Employer may also present any of his demands at the counters of the.....(Name and branch of the Bank in Nepal)for further relay to us.

2. The name of the purchaser should appear at the back side of stamp paper in the Vendors Stamp. Bank guarantee should contain rubber stamp of the authorized signatory of the bank indicating the name, designation and signature/ power of attorney number as well as telephone/ fax numbers with full correspondence address of the Bank.

Bank Guarantee in NPR should be executed on letter head of the “A” class commercial Bank. The issuing Bank shall be requested independently for verification/confirmation of the Bank Guarantee issued, non confirmation of which may lead to rejection of ‘Bid Security. The Bank Guarantees in INR shall be acceptable only if these are issued by a Scheduled Bank of India duly counter guaranteed by any A class bank in Nepal.

3. Bank Guarantee is required to be submitted directly to the Employer by the issuing bank (on behalf of Contractor) under registered post (A.D.). The Contractor can submit an advance copy of Bank Guarantee to the Engineer .

4. The issuing bank shall write the name of bank’s controlling branch/ Head Office along with contact details like telephone/ fax and full correspondence address in order to get the confirmation of BG from that branch/ Head office, if so required.

VOLUME – I
(SECTION-5)

Data Sheets

Data Sheets

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DATA SHEET - 1

Personnel Capabilities

Name of Bidder or Partner of a joint venture
--

*For specific positions essential to contract implementation, Bidders should provide the names of at least two candidates qualified to meet the specified requirements. The data on their experience should be supplied in separate sheets using **Form 1A** for each candidate.*

1.	Title of position	
	Name of prime candidate	
	Name of alternate candidate	
2.	Title of position	
	Name of prime candidate	
	Name of alternate candidate	
3.	Title of position	
	Name of prime candidate	
	Name of alternate candidate	
4.	Title of position	
	Name of prime candidate	
	Name of alternate candidate	
5.	Title of position	
	Name of prime candidate	
	Name of alternate candidate	

Note: Names proposed above will be posted against the work. Any change in name at later stage will require the approval of the Employer.

DATA SHEET - 1A

Personnel Candidate Data

Name of Bidder or Partner of a joint venture
--

Position		Candidate () Prime () Alternative	
<i>Candidate information</i>	Name of candidate		Year of birth
	Professional qualifications		
<i>Present employment</i>	Name of employer		
	Address of employer		
	Telephone Fax		Contact (manager/personnel officer)
	Present job title of candidate		Years with present employer

Summarize professional experience to meet the specified requirements, in reverse chronological order. Indicate particular technical and managerial experience relevant to the Project.

<i>From: month/yr.</i>	<i>To: month/yr.</i>	<i>Company</i>	<i>Project (country)/Position/Relevant technical and management experience</i>

DATA SHEET - 2

Proposed Site Organization

Name of Bidder or Partner of a joint venture
--

A. Preliminary Site Organization Chart *

B. Narrative Description of Site Organization Chart

C. Description of Quality Assurance at Site

D. Description of Relationship between Head Office and Site Management

* **Note:** The details of foreign nationals (number and designation) to be deployed at site should also be specified.

DATA SHEET – 3

ERECTION PROGRAMME

Name of Bidder or Partner of a joint venture
--

Submit Erection programme in bar chart form, which starts at the date of Letter of Acceptance and is completed within scheduled time.

The Erection Programme shall show various activities and their period including interdependent milestones.

DATA SHEET 4

ERECTION METHODOLOGY

Name of Bidder or Partner of a joint venture
--

The Bidder shall submit an outline of description of proposed methods, sequences, facilities and layouts to be used for construction. The information should be submitted in sufficient detail to allow an assessment of the general adequacy of the Bidder's proposal. Sketches, drawings and diagrams should be included where ever necessary for clarification of the description. Required number and classification of manpower, equipment and materials to be used for each particular activity shall be described. The Bidder shall prepare construction methodology in detail after careful study of Project site. The Erection methodology should commensurate with their equipment planning (with month-wise deployment schedule), project personnel and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, demonstrating their capability of achieving the completion of Works as per specified Interim Contract Milestones within the stipulated Time for Completion referred to in Appendices.

DATA SHEET-5

BREAK DOWN OF PRICES

(To be submitted later, if required by the Employer)

Name of Bidder or Partner of a joint venture
--

Note: *Bidders are not required to complete this Data Sheet at the time of preparation of Bids. Only the Bidders, who are requested by the Employer, will submit the analysis of unit rates as per the format below in accordance with the Instructions to Bidders. (Clause 27.1).*

Bidder shall provide the breakdown of such Unit Prices as the Employer may determine, in accordance with the form shown hereunder. This cost breakdown shall include the overhead and profit. This form shall become part of the Contract and no claims may be made against the Employer for excess or deficiency therein whether actual or relative to other items.

Item No. _____ (in the Schedule)

Work: _____

Unit Price:

Particular Description (by item): Unit Quantity Rate Amount

1. Material costs

Subtotal 1 ----- -----

2. Manpower costs (by grade, except supervisory and managerial staff)

Subtotal 2 ----- -----

3. Plant and equipment costs (by type)

Subtotal 3 ----- -----

4.	Costs of supervisory and managerial staff		

	Subtotal 4	-----	-----
5.	Other direct		

	Subtotal 5	-----	-----
6.	Indirect costs, if any		

	Subtotal 6	-----	-----
7.	Overhead and profit		

	Subtotal 7	-----	-----
	Total 1+2+3+4+5+6+7	=====	=====

Signature: _____

Title and position: _____

Data Sheets-6
Details of Taxes and Duties considered in the Bid
(To be submitted with Price Bid)

Sr. No.	Tax Heads	Rate

Note: In case bidder's provided rate(s) of Taxes are at variance with that actually prevailing on the specified date, the actually prevailing rate(s) shall only be considered for the purpose of adjustment of contract price.

.....
.....

Other terms and conditions of the bidding documents shall remain unchanged.

SJVN ARUN-3 POWER DEVELOPMENT CO. (P) LTD.

(A company promoted by SJVN Ltd., a joint venture of Govt. of India and Govt. of HP)



ARUN-3 HYDRO ELECTRIC PROJECT (900 MW)

DISTT. SANKHUWASABHA, NEPAL

Tender No.: ICB-P&C-AHEP-HM-C-5/2023

HYDRO-MECHANICAL WORKS- PRESSURE SHAFT STEEL LINER OF ARUN-3 HYDROELECTRIC PROJECT (900 MW) LOCATED IN SANKHUWASABHA DISTT. IN NEPAL

Volume-II

➤ BILL OF QUANTITIES (BOQ)

TUMLINGTAR, NEPAL

FEBRUARY, 2023

PREAMBLE

The contractor shall indicate the prices of equipment in the Price Schedule, which form part of the tender specifications. The quantities mentioned in the price schedule are the quantities of work to be done by the contractor. The unit price in the price schedule will form the basis for payments for such works.

The prices in the price schedule shall, except where otherwise provided in the contract, cover all the contractor's obligations under the contract and all items necessary for the proper execution of the work, as envisaged in the contract documents. The description of work covered under different items is merely to identify the location and the nature of the work whereas the exact nature and extent of the works is to be ascertained from the Specification Drawings and Technical specifications and conditions of contract read in conjunction with the method of measurement i.e. Measurement is to be made in terms of the units mentioned in the price schedule and the payment will be made for quantities of work done against each item.

All the columns in the main price schedule & sub-price schedules must be filled up by the contractor and further, the total of sub-price schedule must tally with the main price schedule.

In case of discrepancies in main price schedule and sub-price schedules, the rates indicated in the sub-price schedule shall be considered and the main price schedule shall be corrected accordingly.

For items of Pressure Shaft Steel liner, only the unit price quoted in the price schedule shall be payable to the contractor even if there is increase in quantities (Weight/RM/Set) during performance of contract. The price shall be on item rate basis.

The variation in quantities of Supply portion and Services Portion in Price Schedule is due to availability of some quantity of Supply portion items no. 101 (ASTM A 537 Class -2, thk-18 mm), 102 (ASTM A 517 Gr-F, thk-38 mm) & 107 (Rail track) with SAPDC.

The measurement and payments shall be governed as per the clause no. 1.20.0 of Technical Specifications (Section-A, Chapter-1).

The Unit Price mentioned (Supply Portion and Services Portion) shall be inclusive of all taxes and duties.

BILL OF QUANTITIES (BOQ)

1. Main Price Schedule- 1A (Supply Portion) Tender

Final Quantities for Retendering of PSSL (Supply portion)

1. Main Price Schedule- 1A (Supply Portion) (Pressure Shaft Steel Liner and Associated Equipment)									
Sr. No.	Main Head	Sub Head	Articles or Services	Unit (Sets/Nos./MT)	Quantity to be executed	Unit Price-e-RA (INR)	Unit Price e-RA (NPR)	Total Amount e-RA (INR)	Total Amount e-RA (NPR)
101	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A537 Class-2)	Procurement, fabrication, painting (including shop and field) and supply of pressure shaft steel liner comprising of straight shells, bends, matching pieces, removable flanged assemblies with fittings from steel plates conforming to ASTM A537 Class-2 or equivalent complete with stiffener rings, backing strips, grout holes and plugs in assemblies, removable bulk heads, supports etc. including preparation of fabrication drawings, markings, cutting, edge forming, rolling, welding of steel with pre and post heating as required complete in all respects in accordance with the technical specifications and specification drawings.	MT	1910				
102	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A517 Grade 'F')	Procurement, fabrication, painting (including shop and field) and supply of pressure shaft steel liner comprising of straight shells, bends, matching pieces, removable flanged assemblies with fittings from steel plates conforming to ASTM A517 Grade 'F' or equivalent complete with stiffener rings, backing strips, grout holes and plugs in assemblies, removable bulk heads, supports etc. including preparation of fabrication drawings, markings, cutting, edge forming, rolling, welding of steel with pre and post heating as required complete in all respects in accordance with the technical specifications and specification drawings.	MT	2378				
103	Pressure Shaft Steel Liner and its accessories	Bifurcations	Procurement, fabrication, painting (including shop and field) and supply of Bifurcations conforming to ASTM A517 Grade 'F' or equivalent complete in all respects in accordance with the technical specifications and specification drawings.	MT	243				
104	Pressure Shaft Steel Liner and its accessories	Bifurcations	Procurement, fabrication, painting (including shop and field) and supply of Bifurcations conforming to ASTM A517 Grade 'E/Q' or equivalent complete in all respects in accordance with the technical specifications and specification drawings.	MT	142				
105	Pressure Shaft Steel Liner and its accessories	Reducers	Design, procurement, fabrication, painting (including shop and field) and supply of Reducers (ASTM A517 Grade 'F' or equivalent) complete in all respects in	MT	8				

1. Main Price Schedule- 1A (Supply Portion) (Pressure Shaft Steel Liner and Associated Equipment)

Sr. No.	Main Head	Sub Head	Articles or Services	Unit (Sets/Nos./MT)	Quantity to be executed	Unit Price-e-RA (INR)	Unit Price e-RA (NPR)	Total Amount e-RA (INR)	Total Amount e-RA (NPR)
			accordance with the technical specifications and specification drawings.						
106	Pressure Shaft Steel Liner and its accessories	Inspection Trolleys	Design, procurement, fabrication, delivery, painting (including shop and field) and supply of inspection trolley having a load capacity of 5MT and capable of being dismantled and taken through 600mm dia. manhole and assembled inside the pressure shaft for facilitating its inspection alongwith suitable capacity winch complete in all respects in accordance with the technical specifications.	Set	1				
107	Pressure Shaft Steel Liner and its accessories	Rail Track	Supply, laying and fixing of rail track inside the pressure shaft for facilitating erection of steel liner, concreting, inspection etc. including all cost of embedments, fittings, nuts, bolts etc. complete in all respects in accordance with the technical specifications.	MT	30				
108	Pressure Shaft Steel Liner and its accessories	Radiographic examination of welds	Weld Procedure Test Plates	RM	8700				
109	Pressure Shaft Steel Liner and its accessories	Radiographic examination of welds	Production Weld Tests	RM	80				
110	Pressure Shaft Steel Liner and its accessories	Ultrasonic examination of welds	Weld Procedure Test Plates	RM	4500				
111	Pressure Shaft Steel Liner and its accessories	Ultrasonic examination of welds	Production Weld Tests	RM	40				
112	Pressure Shaft Steel Liner and its accessories	Instruments	Procurement and supply of discharge measuring instruments suitable for a high turbidity water for measuring discharge in pressure shafts complete in all respects in accordance with technical specifications and specification drawings.	Sets	2				
113	Pressure Shaft Steel Liner and its accessories	Instruments	Procurement and supply of Recorder of water level in surge shaft complete in all respects in accordance with technical specifications and specification drawings.	Set	1				
114	Pressure Shaft Steel Liner and its accessories	Instruments	Procurement and supply of Min. 4 (four) Nos. of pressure taps on each pressure shaft at approx. 2D upstream and 6D downstream from centre of butterfly valve for measuring pressure complete in all respects in accordance with technical specifications and specification drawings.	Sets	4				

BILL OF QUANTITIES (BOQ)

1. Main Price Schedule-1B (Services Portion) Tender

BILL OF QUANTITIES (BOQ)

2. Sub Price Schedule- 1A (Supply Portion) Tender

2. Sub Price Schedule- 1A (Supply Portion) (Pressure Shaft Steel Liner and Associated Equipment)									
Sr. No.	Main Head	Sub Head	Articles or Services	Unit (Sets/Nos./MT)	Quantity to be executed	Unit Price e-RA (INR)	Unit Price e-RA (NPR)	Total Amount e-RA (INR)	Total Amount e-RA (NPR)
101	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A537 Class-2)	Cost of Material	MT	1910				
102	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A537 Class-2)	Manufacturing Cost	MT	1910				
103	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A537 Class-2)	Cost of Shop and Field Painting	MT	1910				
104	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A517 Grade 'F')	Cost of Material	MT	2378				
105	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A517 Grade 'F')	Manufacturing Cost	MT	2378				
106	Pressure Shaft Steel Liner and its accessories	Pressure Shaft Steel Liner (ASTM A517 Grade 'F')	Cost of shop and Field Painting	MT	2378				
107	Pressure Shaft Steel Liner and its accessories	Bifurcations (ASTM A517 Grade 'F')	Cost of Material	MT	243				
108	Pressure Shaft Steel Liner and its accessories	Bifurcations (ASTM A517 Grade 'F')	Manufacturing Cost	MT	243				
109	Pressure Shaft Steel Liner and its accessories	Bifurcations (ASTM A517 Grade 'F')	Cost of Shop and Field Painting	MT	243				
110	Pressure Shaft Steel Liner and its accessories	Bifurcation (ASTM A517 Grade 'E/Q' or equivalent)	Cost of Material	MT	142				
111	Pressure Shaft Steel Liner and its accessories	Bifurcation (ASTM A517 Grade 'E/Q' or equivalent)	Manufacturing Cost	MT	142				
112	Pressure Shaft Steel Liner and its accessories	Bifurcation (ASTM A517 Grade 'E/Q' or equivalent)	Cost of Shop and Field Painting	MT	142				
113	Pressure Shaft Steel Liner and its accessories	Reducers	Design Cost	MT	8				
114	Pressure Shaft Steel Liner and its accessories	Reducers	Cost of Material	MT	8				
115	Pressure Shaft Steel Liner and its accessories	Reducers	Manufacturing Cost	MT	8				
116	Pressure Shaft Steel Liner and its accessories	Reducers	Cost of Shop and Field Painting	MT	8				
117	Pressure Shaft Steel Liner and its accessories	Inspection Trolleys	Design Cost	Set	1				
118	Pressure Shaft Steel Liner and its accessories	Inspection Trolleys	Cost of Material	Set	1				
119	Pressure Shaft Steel Liner and its accessories	Inspection Trolleys	Manufacturing Cost	Set	1				

2. Sub Price Schedule- 1A (Supply Portion) (Pressure Shaft Steel Liner and Associated Equipment)									
Sr. No.	Main Head	Sub Head	Articles or Services	Unit (Sets/Nos./MT)	Quantity to be executed	Unit Price e-RA (INR)	Unit Price e-RA (NPR)	Total Amount e-RA (INR)	Total Amount e-RA (NPR)
120	Pressure Shaft Steel Liner and its accessories	Inspection Trolleys	Cost of Shop and Field Painting	Set	1				

BILL OF QUANTITIES (BOQ)

3. Sub Price Schedule-2A (Supply Portion) of Additional Spares

3.0 Sub Price Schedule-2A (Supply Portion) of Additional Spares Recommended by the Bidder

Sr. No.	Articles or Services	Qty/No.	Unit (Sets/Nos.)	Unit Price (INR)	Unit Price (NPR)	Total Amount (INR)	Total Amount (NPR)
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

BILL OF QUANTITIES (BOQ)

3. Sub Price Schedule-2B (Services Portion) of Additional Spares

BILL OF QUANTITIES (BOQ)

4. Sub Price Schedule-3A (Supply Portion) of Additional Tools & Tackles

4.0 Sub Price Schedule-3A (Supply Portion) of Additional Tools & Tackles Recommended by the Bidder

Sr. No.	Articles or Services	Qty/No.	Unit (Sets/Nos.)	Unit Price (INR)	Unit Price (NPR)	Total Amount (INR)	Total Amount (NPR)
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

BILL OF QUANTITIES (BOQ)

4. Sub Price Schedule-3B (Services Portion) of Additional Tools & Tackles

SJVN ARUN-3 POWER DEVELOPMENT CO. (P) LTD.

**(A company promoted by SJVN Ltd., a joint venture of Govt. of India and Govt. of HP
)**



ARUN-3 HYDRO-ELECTRIC PROJECT (4 x 225 MW), NEPAL

DISTT. SANKHUWASABHA, NEPAL

**DESIGN,PROCUREMENT, FABRICATION, SHOP ASSEMBLY, PAINTING,
SHOP TESTING, TRANSPORTATION, SUPPLY, ERECTION, TESTING &
COMMISSIONING OF**

PRESSURE SHAFT STEEL LINER OF ARUN-III HEP NEPAL

Volume III

TECHNICAL SPECIFICATIONS

TUMLINGTAR, NEPAL

FEBRUARY,2023

TECHINICAL SPECIFICATIONS

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Abbreviations

Abbreviations Used

AHEP	Arun-3 Hydroelectric Project
SAPDC	SJVN Arun-3 Power Development Company Pvt. Ltd.
ANSI	American National Standard Institute
Approx.	Approximate
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
ISO	International Organization for Standardization
AC	Alternate Current
BHN	Brinell Hardness Number
B.I.S.	Bureau of Indian Standards
Brg Slv	Bearing Sleeve
B.D.T	Break Down Torque
C/C	Centre to Centre
C/L	Centre Line
Clr Sft	Collar shaft
Col.	Column
deg.c	Degree Celcius
dia	Diameter
db	Decibel
Del.	Delivery
DIN	Deutsches Institute fur Normung
Δ	Difference
El.	Elevation
Engrs	Engineers
E.O.T	Electric Overhead Travelling
Ex-F	Ex-Factory
Ere	Erection
FRL	Full Reservoir level
h	Head
H	Total Head
HFL	Highest Flood Level
HZ	Hertz
IS	Indian Standard
kg.	Kilogram
KV	Kilovolts
KW	Kilowatts
FC	Foreign Currency
IS	Indian Standard
LC	Local Currency
mm	Millimetre
m	Metre.
MWL	Maximum water level

Max.	Maximum
Min.	Minimum
min.	Minute
m ³ /Hr.	Cubic Metre per Hour
M.S	Mild Steel
M.T	Metric Tonne
mpm	Metre per Minute
No.	Number
η	Efficiency
NEMA	National Electrical Manufacturers Association
P.O.T	Pullout Torque
PPM	Parts Per Million
Qty.	Quantity.
rpm	revolutions per Minute
SAIL	Steel Authority of India Limited
Sq.m	Square metre
Sec.	Second
TEFC	Totally enclosed fan Cooled
t	Metric tonne
U.T.S	Ultimate Tensile Stress
γ	Specific Weight
wxh	Width x Height
Y.P.	Yield Point
INR	Indian Rupee
NPR	Nepalese Rupee

Section: A

CHAPTER -1

Pressure Shaft Steel Liner

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1.0.0 Pressure Shaft Steel Liner

1.1.0 Scope of Work

The specifications described herein-under cover design, procurement, fabrication, shop assembly, painting, testing, transportation, supply, erection, site testing and commissioning of Pressure shaft steel liner as per general layout approved drawing no. ARUN-III HEP/PSL/1200 (sheet 1 & sheet 2), ARUN -III HEP/PSSL/1218A (sheet 1 ,sheet 2,sheet 3 & sheet 4) , ARUN-III HEP/PSSL/1217 & ARUN-III HEP/PSSL/1239 at site complete in all respects, for Arun-3 Hydroelectric Project, in accordance with these Technical Specifications and Specification Drawings. The materials, workmanship, technical requirements, equipment, accessories, supplies and services required, shall be as set forth in these Technical Specifications.

The scope of work also covers supervision of unloading, stacking, operation, storage and preservation of components of pressure shaft steel liner and its accessories in the stockyards of the Contractor at the project site before they are transported, installed, tested and commissioned at their respective sites.

The various items involved in the scope of work mentioned herein shall generally consist of the following but not necessarily be restricted to:

- i) Two (2) sets of pressure shaft steel liner of dia. 5500mm, bifurcations (2 Nos.), branches (4 Nos.) of dia. 4000mm and their accessories, complete in all respects.
- ii) One (1) set of Inspection trolley having a load carrying capacity of 5 MT and capable of dismantled and taken through 600mm dia. manhole and assembled inside the pressure shaft alongwith suitable capacity winch complete in all respects.
- iii) Two (2) sets of rail tracks inside the pressure shaft for facilitating erection of steel liner, concreting, inspection etc. complete in all respects.
- iv) Radiographic examination of the weld.
- v) Ultrasonic examination of the weld.
- vi) Measuring Instruments:

The following instruments shall be supplied and installed by contractor for this work:

- a) Two (2) sets of discharge measuring instrument suitable for a high turbidity water for measuring discharge in pressure shaft.

- b) One (1) set of recorder of water level in surge shaft.
- c) Four (4) Nos. of pressure taps on each pressure shaft at approx. 2D upstream and 6D downstream from centre of butterfly valve for measuring pressure.
- vii) 5 (five) sets (4 hard copies and 1 soft copy with indexing) of operation and maintenance (O&M) manuals containing drawings etc.
- viii) 4 (four) sets (3 hard copies and 1 soft copy) of abridged manufacturing history records and inspection & test records for all equipment to be supplied under the scope of work.
- ix) 2 (two) sets (1 hard copy and 1 soft copy) of erection & commissioning documents for pressure shaft steel liner and accessories.

1.2.0 Description and Design Criteria

1.2.1 Introduction

- i) Two nos. pressure shafts of 5.5m diameter takes off from the bottom of surge shaft with its centre line at EL 784.11m. The approximate length of Pressure shaft-1 is 432m and Pressure shaft-2 is 402m upto centre line at elevation EL 525m before each pressure shaft bifurcates into two branches (approx. length 71m and 58m) of 4.0m diameter each.
- ii) The total length of the pressure shafts and branches given above may vary and subject to adjustment to suit the final dimensions adopted for the detailed layout.

1.2.2 Design Criteria

The pressure shaft steel liner shall be designed with the following objectives:

- a) Internal water pressure corresponding to the maximum surge in the upstream surge shaft i.e .EL. 888.52 m or static head alongwith maximum normal water hammer pressure at turbine inlet whichever is higher.
- b) External static water pressure corresponding to NSL while the steel liner is empty.

The alignment of pressure shaft as shown in drawings have been based on the available topographical and geological data. It is likely the same may alter due to additional data and information obtained due to subsequent investigations. During detailed engineering, the changes (if any) as necessary will be communicated in reasonable time in writing to the contractor by the Engineer.

1.2.3

Loads to be considered

Loads arising during installation and concreting of the liners, due to self-weight of shell between support and due to buoyancy forces resulting when concrete is placed around the liners. Installation supports (permanent/ temporary) shall be designed for the same.

The following shall be considered in the design of pressure shaft steel lining.

a) Normal Condition

- Internal water pressure corresponding to the maximum surge in the upstream surge shaft i.e. EL. 888.52m or static head alongwith maximum normal water hammer pressure at turbine inlet whichever is higher.
- External static water pressure corresponding to NSL while the steel liner is empty.
- Load induced due to temperature variation of water from 6°C to 25°C (Tentative & shall be confirmed during detail design engineering).
- Poisson's effect associated with radial expansion of liner under internal pressure.

b) Intermittent Condition

- Intermittent condition includes those during filling and draining of pressure shaft.
- Internal water pressure corresponding to the maximum surge in the upstream surge shaft i.e.EL. 888.52 m with pressure rise during normal water hammer pressure at turbine inlet. The internal pressure shall be assumed to be linearly varying between surge shaft and turbine inlet for the above water head.
- External static water pressure corresponding to NSL while the steel liner is empty.
- Load induced due to temperature variation of water from 6°C to 25°C (Tentative & shall be confirmed during detail design).
- Poisson's effect associated with radial expansion of liner under internal water pressure.

c) Emergency Condition

- This condition includes partial gate closure in critical time of penstock (2L/a seconds) at maximum rate, and the cushioning stroke being inoperative in one unit.

d) Exceptional Condition

- The dynamic pressure rise due to slam shut, malfunctioning of control equipment in the most adverse manner resulting in odd situation of extreme loading.

e) Rock Participation

- The steel liner shall be designed to take the entire internal pressure independently without any rock participation.

1.2.4

Design Data

The design data for the pressure shaft steel liner is broadly mentioned below:

a)	Elevation at the C/L of start of Pressure shafts	EL 784.11m
b)	Full reservoir level (static condition)	EL845.0m
c)	Maximum Surge level	EL888.52 m
e)	Axis of Main Inlet Valves	EL 525.0m
f)	No. of Main Pressure Shafts	2 Nos.
g)	No. of branches in each main pressure shaft	2 Nos.
h)	Internal Diameter of Main Pressure shafts	5.5m
i)	Internal Diameter of Branches	4.0m
j)	Governing Standards	Indian IS:11625(Criteria for hydraulic design of penstocks) IS:11639(Part-II)- Criteria for structural design of penstocks (Buried/embedded Penstocks)

IS:11639(Part-III)-Criteria for structural design of penstocks (Specials for penstocks)

IS:2825(Code of unfired pressure vessels)

Boiler and Pressure Vessel Code of American Society of Mechanical Engineers.

- k) Seismic coefficients $\alpha_h = 0.24g$
 $\alpha_v = 0.16g$

1.3.0

Submittals

- i) Within thirty days from the date of issue of the Letter of acceptance but before procuring and mobilisation of equipment and plants to the Site, the contractor shall submit to the Engineer, complete details of equipment and plants proposed for fabrication, erection, painting and testing of the steel liner shells.
- ii) The contractor shall specify in his bid and subsequently also, if required by the Engineer, the source(s) from which the contractor shall procure steel plates required for the steel liner. In case the specified source is not acceptable to the Employer, the contractor shall be obliged to substitute the source by an acceptable source. Additional suppliers and change of suppliers shall be subject to the approval of Employer.

If the materials are to be arranged from several sources, the estimated quantity to be procured from each source and proposed schedule of supply shall be submitted to the Engineer.

- iii) Within thirty days from the date of issue of the Letter of Acceptance, the contractor shall furnish to the Engineer, the details of skilled categories of workmen proposed to be engaged on the work.
- iv) At least 30 days in advance of fabrication, the contractor shall submit to the Engineer the schedule of fabrication of the entire work.
- v) Within 30 days from the date of issue of Letter of acceptance, the contractor shall submit, in triplicate, to the Engineer the, shop and field drawings etc. based on the already approved Design/Drawings no. ARUN-III HEP/PSL/1200 (sheet 1 & sheet 2), ARUN -III HEP/PSSL/1218A (sheet 1, sheet 2, sheet 3 & sheet 4) ARUN-III HEP/PSSL/1217 & ARUN-III HEP/PSSL/1239 as under:

- a) Fabrication drawings of all the straight shells.
- b) Development drawings for bends, reducer, cones, bifurcation and bulkheads and their fabrication drawings.
- c) Drawings exhibiting plate-cutting schedules clearly identifying as to how the contractor intends to utilise each of the steel plates.
- d) Design and drawings of manhole arrangement (if required) and drawings for piezometer connections etc.
- e) Design and drawings of ring girder supports (if required) and thrust collars.
- f) Steel liner assembly drawings indicating the shell numbers, position of manholes and other important features and clearly identifying the shop welds and field welds.
- g) Drawings showing edge preparation details (weld groove design) and any other relevant details for the various types of joints involved.
- h) Statement showing weights of the fabricated components intended to be billed duly supported by the computations.
- i) Drawings indicating arrangement for hydrostatic shop testing of steel liner components.
- j) Drawings indicating identification markings intended to be made for radiographic or ultrasonic inspection of welds.
- k) Drawings showing details of embedments of rail track and other arrangement intended for handling and erection.
- l) Any other drawings or calculations that may be required for the clarification of the work.
- m) While submitting duly authenticated drawings for approval, the contractor shall also provide editable soft copy of each drawing.
- n) The contractor shall certify that design & drawings furnished by him have been checked before submission and he shall be responsible for the correct fitting of the parts.
- o) Drawings indicating arrangement of discharge measurement device, recorder of water level in surge shaft and pressure taps.

- vi) All design and drawings submitted will form a part of the contract. The sequence of submission of design & drawings will also form a part of the contract. The sequence of submission of all the designs & drawings shall be such that complete information is available for checking of each drawing, when it is received. The contractor shall submit two soft copies of design and drawings on DVDs/ pen drives and one complete set of supporting software packages and programs used in preparation of the designs, drawings, other documents and schedules with his first submission to enable the Employer to properly check the same with the help of the software packages/programs. The design and drawings submitted shall have facility for editing etc. The DVDs/ pen drives and software packages and programs will form a part of contract and shall be the property of the Employer. The Employer will return a copy of each drawing to the contractor marked either 'Approved' or 'Approved as noted' or 'Returned for corrections/modifications'. The notation 'Approved' or 'approved as noted' shall authorize the contractor to proceed with the manufacture of the equipment covered by such drawings subject to the corrections, if any, noted thereon. When the design computation/ prints of drawings have been returned for corrections/ modifications, the contractor shall revise/modify the design & drawings as necessary and shall resubmit fresh design computation/drawings for approval in the same routine as before. Any fabrication work performed prior to the approval of drawings, will be at the contractor's risk. The Employer shall have the right to ask the contractor to make changes in the design, which may be necessary in the opinion of the Employer to make the equipment to conform to the stated provisions and intent of the specifications, without any additional cost. After designs and drawings are completed and approved, the manufacturer shall supply to the Employer 4(Four) prints of each of the approved drawings, out of which 2 (Two) prints shall be duly laminated whereas in respect of finally approved design computations four sets shall be supplied. However, prior to completion of contract, manufacturer shall supply 4 (Four) prints of all approved as built drawings plus one good quality polyester film transparency for each drawing suitable for microfilming.
- vii) At least 30 days in advance of the transportation of steel liner assemblies to the site of erection, the contractor shall supply the following details to the Engineer for approval.
- a) Method/procedure for handling and transportation of various assemblies, specials and equipment to be used therefore.
 - b) Arrangement/procedure for handling/erection of steel liner assemblies and specials etc. into the tunnel alongwith details of equipment to be deployed, procedure for alignment and welding in field.

- c) Detailed procedure for sand blasting and applying necessary primer etc. in shop and coats of paint to be applied in shop/field alongwith necessary tests therefore.
- d) The contractor shall submit alongwith each consignment of assemblies, accessories of steel liner, the parts catalogue and operation instructions in English language especially prepared to cover all the work/items of equipment furnished under these specifications which may be needed or may otherwise be useful in operation, maintenance, painting, repair, and for the repair and identification of parts/materials for ordering replacement. All name plates, instruction plates, warning signs and any marking whatever on the equipment and its parts and accessories shall be in English language.
- viii) Atleast 30 days prior to commencing radiographic examination, the contractor shall submit details of all radiographic equipment, processes and procedures for the approval of the Engineer. The type and make of the radiographic films intended to be used shall also be got approved from the Engineer.
- ix) The Engineer reserves the right to require any additional information deemed necessary to be included in the submitted documents.

1.4.0

Standards

- i) All works and supplies shall conform to the following Indian Standards or where not covered by these standards, to the equivalent International Standards.
 - a) Steel plates and other Materials

S. No.	Material	Standards
A.	Steel plates for steel liner (Variable thickness)	<ul style="list-style-type: none"> i) ASTM-A 537 Class 2 or other International equivalent pressure vessel, Carbon- Manganese-Silicon, steel plates. ii) ASTM-A-517 Gr. F or other international, pressure vessel plates, alloy steel, high strength quenched and tempered (EHT). iii) ASTM-A-517 Grade E / Q iv) The material supplied shall conform to ASTM-A-20/A20M. v) Mechanical testing of steel

product shall conform to ASTM A 370.

- vi) Standard specification for through thickness tension testing of steel plate for special application shall conform to ASTM A770/A770M-86.
- vii) Standard specification for steel, sheet and strip, hot rolled, carbon, structural, high strength low alloy and high strength low alloy with improved formability shall conform to ASTM A 1011/ A1011M-00.
- viii) Guide for general requirements for assessment and accreditation of certification/ registration bodies shall conform to ASTM E1905-97.
- ix) Standard test methods practices and terminology for chemical analysis of steel products shall conform to ASTM A 751-96.
- x) Inspection and testing as per IS: 2825-1969 ASME Boilers and Pressure Vessel Code.

B.	M.S. Bolts, studs, nuts and washers	IS:1364 Grade S-Semi precision or equivalent
C.	Stainless steel for piezometer plugs	BS: 970-EN-56-A or IS: 1570 (Schedule-V) or equivalent.
D.	Gasket or joining materials	BS:1737 or relevant IS Specifications
E.	Welding electrodes	IS: 814
F.	Paints	
	<ul style="list-style-type: none"> • Zinc rich primer 	AWWA Specifications or equivalent IS specifications
	<ul style="list-style-type: none"> • Cold applied 	AWWA Specifications or equivalent IS

coal tar epoxy Specifications.
paint

The contractor, while examining the plates, shall ensure that all requirements of the material specifications have been fulfilled by the manufacturer of the steel plates. In the certifications, the contractor shall also state that the necessary certified results of chemical, mineralogical and mechanical tests (e.g. yield strength, tensile strength, minimum elongation, notch-toughness test etc.) and heat treatment etc. have been furnished by the manufacturer and all required inspections have been carried out by the contractor.

- b) Welding:
 - IS:2825-1969 (Latest edition)

'Code for Unfired Pressure Vessels'
 - ASME 'Boiler and Pressure Vessel Code of American Society of Mechanical Engineers.'
- c) Painting
 - AWWA-C-203-78

'Coal tar protective coating and lining for steel water pipe lines standard of American water works Association.'
- d) Inspection & testing
 - IS:2825-1969 (Latest edition)

'Code for Unfired Pressure Vessels'
 - ASME

'Boiler and Pressure Vessel Code of American Society of Mechanical Engineers.'
 - AWWA-C-203-78

'Recommended practice for Non-destructive testing, personnel qualification and certification of the American Society.'
- ii) In case of the conflict between the above standards and the specifications given herein the specification shall take precedence.

1.5.0

Steel Plates

Steel plates required for the fabrication and its specials/accessories shall be arranged/ procured by the contractor, the cost of which shall be deemed to be included in the tendered rates. These steel plates shall be

sufficient for the fabrication and erection of straight shell, bends, bifurcation, stiffener rings, manholes, ring girder supports, permanent supports, bulkheads and any other item required for the completion of the work. It should be clearly understood by the bidder that tonnage of steel plates shall be higher than that of finished product on account of:

- i) wastage during cutting & grinding
- ii) wastage in the form of cut pieces and over weight due to variations/tolerances in length, width and thickness of steel plates.

It shall be in the interest of the bidder to work out the exact quantity of steel plates required for the fabrication of pressure shaft steel liner and its specials/ accessories, based upon the drawings in order to assess the cost of steel plates which he has to take into account while preparing the Price Bid. The bidders, while quoting their rates, shall also take care for the finished product, the weight of which shall be calculated theoretically without considering any variation /tolerance in the dimensions and thickness of steel plates. No extra payment, what-so-ever shall be made to contractor on this account including any taxes, duties, octroi, import duty, insurance etc. paid by the contractor during the process of procurement of steel plates. It may further be noted that all cut pieces and surplus plates, if any, after fabrication shall remain the property of the contractor. However, no compensation for such cut pieces and surplus plates shall be payable to the contractor by Employer.

The steel plates to be arranged/ procured by the contractor shall confirm to the following specifications:

Pressure Vessel Plates, Heat Treated, Carbon– Manganese – Silicon steel conforming to ASTM-A-537 class 2 or equivalent (killed quality). Each steel plates shall be ultrasonically tested as per ASTM-A-578.

Additional requirement for ASTM quality steel plates:

- a) Permissible variation under & above in specified width and length shall be in accordance with ASTM-A-20 M-91a.
- b) Negative tolerance on thickness shall not be acceptable; whereas positive tolerance in thickness shall be as per ASTM-A-20 M-91a.
- c) Marking shall be made on each steel plates, indicating thereon name or brand of the manufacturer, heat and slab number, specification number and grade, class dimensions, weight and type etc, in accordance with ASTM –A-20-M-91 a. Marking shall be done by steel die stamping and/or by stencilling.
- d) Edges of each steel plate shall be sheared from all four sides.

- e) Tolerance in squareness shall be ensured to the maximum accuracy. The diagonal difference will not exceed 1% of the nominal width.
- f) Necessary test certificates or photo copies thereof relating to mechanical properties, chemical composition, ultrasonic testing and heat treatment temperature etc. of steel plates supplied shall be furnished by the supplier for each plate/heat before the actual shipment. Various tests shall be carried out in accordance with the requirements of ASTM-A-20-M-91 and other relevant ASTM standards.

Within 30 days after the award of work, the contractor shall precisely work out the quantity of steel plates based upon the GA drawings. The length of the steel plates shall be so selected that there is preferably only one long joint in any shell. However, maximum two long joints shall be permitted. The final quantity of steel plates, worked out by the contractor, along with Technical Specification shall be submitted to Employer for scrutiny and approval. Thereafter, procurement action shall be initiated by the contractor without waiting for final civil construction drawings. It may be clearly understood by the bidder that the procurement of steel plates has to be initiated and completed without any loss of time.

1.6.0 Approval of Material and Inspection

1.6.1 Certification of Product by a Third Party

When a third party certifies the product of a steel plant, the third party shall comply with the definition of the ASTM E-1905: Guide for general requirements for assessment and accreditation of certification/registration bodies. In addition, the third party shall do one inspection per year to check the quality organisation of steel plant (in the spirit of the ISO 9001 if possible), including sampling and the testing of the products with an accepted laboratory.

1.6.2 Procedure for Steel Supplier Acceptance

In order to guarantee the quality and the evenness of the steel products, manufacturers shall agree to the following criteria:

If there is a certification of the product by a third party, it shall meet the definition of "Certification of a product by a third party" and only one audit is recommended.

If the steel plant product is not certified by a third party, but the steel works is certified ISO 9001, a technical audit about supplied material shall be done as well as factory tests.

If the steel plant product is not certified by a third party and not certified ISO 9001, an audit about organisational and technical aspects, factory tests shall be imposed, on site test with a greater frequency than for a steel plant which is certified ISO 9001.

1.6.3 Type of Testing

a) Non specific test

Non specific testing is the testing done by the manufacturer, using his own method and process, to check the properties of the material to be delivered. Such testing is not necessarily to be done at site.

b) Mill specific testing (specific to the product)

All testing shall be done in accordance with test methods and in accordance with ASTM A370 or equivalent.

1.6.4 Inspection

Third party inspection shall be carried out on behalf of the contractor subject to the prior approval of third party inspection agency by the Engineer. The inspector representing the purchaser/contractor shall have entry at all times while work on the supply of the purchaser is being performed to all parts of the manufacturer's works. The manufacturer shall provide all reasonable facilities to satisfy that the material is being furnished in accordance with the specifications.

In order to be sure of the steel grade or quality, the contractor and Employer shall have free access in the factory, while tests on the material ordered are performed. The Employer shall also reserve its right to get the material tested independently by deputing its Engineers for the inspection of material at source for each consignment. The shipment of steel plates shall start only after the approval of the Engineer.

1.6.5 Storage/Stacking of Steel Plates

The steel plates procured by the contractor shall be properly stacked. Utmost care shall be taken that steel plates of different specifications and thickness are stacked separately. Sign boards for each stack shall be placed at suitable location indicating stack number, type of steel, size of plates and number of steel plates procured etc.

1.7.0 Measuring Instruments

1.7.1 Discharge Measurement

The contractor shall supply a discharge measurement device that shall be suitable to a high turbidity water. The accuracy of the measurement shall be better than $\pm 0.5\%$. This device shall be installed at a location decided by Engineer. The cable shall be safely brought to the power house where it shall come out in a connection box.

1.7.2 Recorder for measuring Water Level in Surge Shaft

The contractor shall supply a recorder for measuring water level in the surge shaft. Suitable tapings shall be provided in pressure shaft for installing the recorder. The water level shall be measured indirectly in terms of pressure in kg/cm^2 . The accuracy shall be 0.05 kg/cm^2 or 0.5m of water column. Data shall be recorded digitally or graphically. The memory should be enough for a week long accumulation of data. Changing the memory card shall be a convenient process. The device shall be installed near the MIV on pressure shaft and the cables shall be safely brought to the power house where it shall come out in a connection box.

1.7.3 Pressure Taps

The contractor shall supply and install pressure taps on both pressure shafts. Pressure taps 4 nos. (in each pressure shaft) shall be installed in a section located at approximate 2D upstream and 6D downstream from the centre of butterfly valve. Each tap shall be connecting to a connecting pipe. The four pipes shall be safely brought to the valve house where it shall come out in a connection box.

1.8.0 Fabrication

1.8.1 General

- i) Fabrication of steel liner shall be strictly in accordance with the fabrication drawings approved by the Engineer.
- ii) The length of the plate will be determined by multiplying internal diameter plus thickness by ' π ' (π). The plate length as far as possible will be close to the required size. However, if more than one plate is required for the Shell, then maximum 2 Nos. longitudinal joints shall be permitted.
- iii) The concentration of the welded joints shall be such that no two main seams come together under an acute angle or cross each other. Where it is not possible to comply with this requirement, the intersection of these welds shall be radio graphed, 100mm each side of such intersection. The longitudinal joints shall be staggered, wherever possible by introduction of circumferential joints by at least five times the thickness of the thicker plate.

- iv) Longitudinal seams of steel liner sections with manholes and piezometer connections etc. as incorporated in the drawings shall not intercept such openings. The designs, size and location of these openings shall be selected as required in IS-2825-1969 (latest edition).
- v) Manholes shall be provided with suitable handles, flanges and covers, properly machined and shall be complete with bolts, nuts, washers, gaskets, etc.

1.8.2

Cutting of Plates and Preparation of Edges

- i) No cutting of plates shall be started without getting relevant drawings approved from the Engineer.
- ii) The cutting of plates shall be planned in such a way so as to minimize the wastage of steel plates.
- iii) Where plates to be welded need cutting to size and shape of squaring in shop, following broad guidelines shall be adopted.

- a) Steel conforming to ASTM-A-537 class 2 or equivalent:

Cutting can be done by machining or flame cutting. Where the plate thickness does not exceed 25 mm, cold shearing may be allowed by Engineer provided that the sheared edge is cut back by machining or chipping for a distance of one quarter of the plate thickness but in no case less than 3mm.

- b) Steel conforming to ASTM-A-517 Grade 'F', 'E'/'Q' or equivalent:

Cutting shall be done preferably by machining. In case flame cutting is resorted to in accordance with the recommendations of steel manufacturer/ supplier, which has the approval of the Engineer, a depth of 2mm to 4mm or as recommended by the steel manufacturer shall be removed by grinding. Further heat input in case of flame cutting shall need to be controlled as per the recommendations of the steel manufacturer so as not to affect basic properties and strength of quenched and tempered steel.

- iv) Plate edges shall be made in conformity with the construction drawings to suit 'V' or 'U' welds as applicable to various thicknesses for all longitudinal and circumferential welds in shop. Edge preparation for all circumferential joints in field shall be to suit single 'U' or joint with backing strip.

- a) Steel conforming to ASTM-A-537 Class 2 or equivalent:

While marking of plates shall be as per approved fabrication drawings, standard/ accepted procedure for marking, edges of steel plates

conforming to the above specifications can be prepared by planning, flame burning, chipping, grinding or arc gauging. Edge preparation details shall be covered in fabrication drawings to be approved by the Engineer.

b) Steel conforming to ASTM-517 Gr. 'F' or equivalent:

Marking shall be conducted with size rulers and templates etc. Punches and chisels shall not normally be used. However, where the use of punches is unavoidable, punches with blunt points can be used and whenever possible, plate shall be marked on the side which shall be inside of the pipe after bending.

1.8.3

Bending of Plates

- i) Plates for shell section shall be formed to required shape by cold bending process only such that it does not impair the quality of steel.
- ii) All plates shall be initially pinch type cold formed/bent on plate bending machine which shall ensure a circular shell from the calculated circumferential length of shell of the required internal nominal diameter.
- iii) Curvature of bent shells shall be checked with the help of necessary templates.
- iv) Correction of curvature neither by blows nor by hot forming shall be permitted.

1.8.4

Plates of Unequal thickness

- i) Steel conforming to ASTM-A-537 Class 2 or equivalent:

Where two plates at a welded joint differ in thickness, the thicker plate shall be trimmed to a smooth taper as per IS: 2825.

- ii) Steel conforming to ASTM-A-517 Gr. 'F' or equivalent:

Where lesser thickness of ASTM-A-517 Gr. 'F' is to be joined with higher thickness of steel referred in (i) above, a matching piece of suitable length of higher/suitable thickness of ASTM-A-517 Gr. 'F' machined to smooth taper shall be provided to make the said joint. The matching piece details shall be duly covered in fabrication drawings.

1.8.5

Stiffener Rings and Backing bars

- i) Stiffener Rings

- a) Stiffener Rings, wherever, required, shall be fabricated from minimum number of circumferential sections but welded together and properly fitted, and welded to the pipes/ferrules such that the plates of rings shall be normal to the axis of pipe/ferrules.
 - b) The butt welds in a stiffener ring shall be so positioned as to have proper staggering with reference to main longitudinal butt welds in the pipe shells.
 - c) The holes/openings shall be drilled in the stiffener rings as per drawings to permit flow of concrete and the same shall have smooth finish.
- ii) Backing bars

The contractor shall prepare backing bars out of 12mm thick steel plates ASTM-A-537 Class 2 or equivalent as per approved drawings intended to be used for field circumferential joints. The width of the backing bar and method of its attachment to the pipe shells shall be indicated in the drawing to be submitted by contractor for approval to Engineer. The contractor shall carry out all necessary cutting, machining, welding etc. for preparing and attaching the backing bars.

1.8.6

Manholes, Nozzles etc.

All manholes, nozzles, flanges and other accessories as may be required, shall be installed on the steel liner sections. The manhole assemblies shall be fabricated in shop which includes making, cutting of steel plates, edge preparation, pinching, rolling, pre-heating,(wherever required), welding heating during inter-pass, post-heating (wherever required), machining, including supply of other materials like, steel, nuts, bolts, washers, gasket/rubber "O" ring etc.

1.8.7

Bifurcations

The bifurcations shall be fabricated in shop which includes, marking, cutting of steel plates for header, branches, ring girder, flange, sickle plate & stiffeners etc. edge preparation, pinching, rolling, pre-heating, welding heating during inter-pass, post heating. Utmost care shall be taken while marking the steel plates so that the required bifurcation angle is precisely achieved.

1.8.8

Thrust collars and Anti Percolation Rings

Thrust collars shall be installed at entry to power house. Anti percolation rings shall be installed in the initial reach of pressure shaft steel liner. The shape of thrust collars/anti percolation rings is same as the stiffener rings. Thrust collars/anti percolation rings wherever, required, shall be fabricated from minimum number of circumferential section but welded together and properly fitted, and welded to the pipes/ferrules such that

the plates of rings shall be normal to the axis of pipe/ferrules. The butt welds in a thrust collar/anti percolation rings shall be so positioned as to have proper staggering with reference to main longitudinal butt weld in the pipe shells. The holes/openings shall be drilled in the thrust collar as per drawings to permit flow of concrete and the same shall have smooth finish.

1.8.9

Bends and Reducers

- i) Bends shall be made of short segments of pipe with metered ends as shown on the drawings.
- ii) Segments of each bend shall be made with equal deflection angles, except for the end ones, which shall be of half the deflection of the other segments.
- iii) Such segments shall be formed from cut plates, with necessary marking.
- iv) For change in diameter of steel liner, reducer pipe shall be provided.
- v) The contractor shall furnish his proposal for preparing, testing and transporting and erection of bends and reducer cones clearly indicating the extent of work intended to be done at the factory and at the site workshop as well as during erection.
- vi) The bends shall be so fabricated as to have a staggering of about 60 degrees between the longitudinal welds in the consecutive bend courses when installed.
- vii) The reducer cones shall have to be fabricated as per the design as may be finalised in consultation with the suppliers of turbine generating sets.

1.8.10

Bulkheads

- i) Bulkhead shall be required for hydrostatic testing of bifurcation.
- ii) The design and fabrication drawings of bulkheads shall be submitted by the contractor well in time to the Engineer for approval.
- iii) The bulk heads shall be arranged/ fabricated by the contractor for this work.

1.8.11

Alignment and Tolerances

- i) Alignment for longitudinal and circumferential joints in shop and circular joints in field for shells made from steel conforming to ASTM-A-537 class 2 or equivalent can be permitted with only minimum number of fit up dogs/cleats which shall be properly welded and neatly removed after

alignment to ensure no injury to the parent plates.

- ii) But while aligning shells made from ASTM-A-517 Gr. 'F', welding of temporary cleats etc. for alignment of shell, shall preferably be avoided as far as possible to ensure that no inadvertent damage occur to parent plate of shell due to welding or removal of cleats later on. The contractor, therefore, shall be required to develop a capsule/man drill fitted with screwed pipe jacks/hydraulic jacks which shall provide perfect alignment of one circular shell with another shell as well as control the gap between them without necessitating welding of fit up cleat/dog etc.
- iii) Before any welding is commenced, it shall be ensured that the chamfered edges are in alignment and that the displacement of the joints for Class-2 steel is less than:

$$\frac{e}{50} + 1 + \frac{\Delta e}{2} \text{ mm for longitudinal joints}$$

and

$$\frac{e}{50} + 2 + \frac{\Delta e}{2} + \frac{\Delta p}{2} \text{ mm for circumferential joints}$$

Where Δe and Δp are the difference between the actual thicknesses (e) of the edges involved and tolerance on the circumference respectively.

- iv) Other tolerances shall be as specified below or as provided in other acceptable International Standards:
 - a) The variation from theoretical shape of straight piece of a shell shall be less than

$$\pm \frac{2r}{1000} + 2\pi(e_f - e_t + 4) \text{ in mm}$$

Where, r = Radius of the shell in mm

e_f = Effective thickness of steel liner plate in mm

e_t = Theoretical thickness of steel liner plate in mm

or

The external circumference of the completed pipe shells shall not depart from the calculated circumference based on the nominal outside

diameter by more than 0.25 percent, whichever is less.

- b) Individual cylindrical shells shall be reasonably square and straight. The straightness of the generating lines of a shell shall be less than $2L/1000$ in mm, where L=Length of a shell in mm.
- c) The irregularities in profile of a shell (checked by 20° gauge) shall not exceed 3mm plus 5 percent of the minimum plate thickness. The maximum value may be increased by 25 percent if the length of the irregularity does not exceed one quarter of the length of the shell with a maximum of 1000mm.
- d) The difference between the maximum and the minimum diameters at any cross section of a shell welded longitudinally shall not exceed 0.50 percent of the nominal internal diameter (with a maximum of $(D + 1250)/200$ in mm).
- v)
 - a) Weld preparations whose cross-sectional dimensions vary from those shown on the approved workshop drawings by more than the following tolerances, shall be corrected prior to welding.
 - i) Root opening of joints ± 1.5 mm
 - ii) Groove angle ± 5 degrees
 - iii) Size and location of root face ± 1.5 mm
 - iv) Radius of 'J'/U' grooves ± 2 mm
 - b) The maximum offset (or other defect in alignment) between abutting external surfaces at any position along a butt joint shall not exceed 2mm for both the longitudinal joints as well as circumferential joints.
 - c) The following limit shall apply to the fit-up of joints to be fillet welded and to the fit-up of stiffener rings (as well as anti-percolation rings) to pipe shells.
 - Gap at joint to be provided is 2mm maximum.

This provision is subject to condition that effective throat thickness of the weld shall be not less than that specified in the approved drawings.

1.9.0

Grouting and Drainage Holes

- i) Holes for grouting and drainage in locations as directed by the Engineer or as shown in the drawings shall be required to be made in the steel

liner.

- ii) Necessary plug for grouting holes shall also be fabricated and supplied by the contractor as per approved drawing and same shall be fitted in position and seal welded after needful operations on site are completed.
- iii) The grout holes shall be sealed by plugs after grouting is completed.
- iv) Grouting is not included in the scope of this work as this shall be done by the employer through the contractor for civil works.

1.10.0

Welding

1.10.1

General

- i) After the edges of the plates have been prepared for welding, as aforesaid, these shall be subjected to a thorough visual examination for flaws, cracks, laminations, slag inclusion or other defects, if any, and no plate(s) where such defects are observed, shall be used for fabrication without the approval of the Engineer.
- ii) The edges of plates shall be free from foreign materials such as rust, scale, paint, oil, slag from the flame cutting or other contaminations of the fusion pieces.
- iii) The surfaces to be welded shall be free from foreign material such as grease, oil or marking paint. Irregularities, infusion faces which are likely to affect the quality of welding shall be removed by grinding before welding is commenced.
- iv) Welding shall be done by a process which shall exclude the atmosphere from the molten metal viz. by hand welding with shielded arc method and wherever practicable, automatic welding machines using shielded arc or submerged arc method shall be used.
- v) The type of joints to be welded shall be either a single or double 'V' or 'U' as shown on the drawings.
- vi) All welding shall be in accordance with the requirements of relevant standards.
- vii) Weld metal shall be deposited in successive layers and each layer shall be cleaned of all slags and other deposits before applying the next layer.
- viii) There shall be at least one layer of metal deposited above the surface. The reinforcement layer shall not exceed $[1+(3/100)(e+b)]$ mm, above the surface of the plate. Where 'b' is the theoretical width between the edges of the chamfer. If transport of sand is to be expected, sill shall be

ground flush over 30 degrees.

- ix) All double 'V' or 'U' joints shall be welded from both sides of joints.
- x) The reverse side shall be prepared by chipping, grinding or flat-gouging so as to secure sound metal from the reverse side.
- xi) Where fillet welds are used, the sections to be joined shall be held firmly in position while being welded.
- xii) To ensure the matching of section at joints, expanding struts or spiders may be used.
- xiii) Temporary welds, where used to hold the sections in position, shall be removed so that they shall not become a part of the permanent welded joints.
- xiv) Whenever possible, joints shall be welded in the flat position.
- xv) Welded joints shall be free from craters, depressions and other irregularities/defects.
- xvi) After the welding is completed, all weld splatter shall be removed.
- xvii) The welding of temporary attachments to the steel liner sections for the purpose of handling or aligning of sections with each other shall be limited only to those essentially required, subject to the approval of the Engineer. All such attachments shall be removed by careful chipping or flame cutting and damage if any, to the steel liner shall be repaired.

1.10.2

Welding Procedures

- i) Mandatory practice of welding High Tensile Steel ASTM-A-537 Class 2 and ASTM A 517 Gr. F or equivalent.
 - a) Fitting:

High tensile steel shells bent to a true circle shall be fitted with sufficient fitting up equipment and finger bars to properly maintain alignment and gap during welding. Tack welds in the joints are allowed to maintain the alignment and gap during the welding operation.
 - b) Welding Process:

Longitudinal and circumferential joints shall be butt welded by either the shielded metal arc (manual) process or the submerged metal arc (automatic welding machine) process.

c) The Filler Metal:

For welding High tensile steel with EHT steel, the filler metal shall conform to that of High tensile steel.

d) Nature of Welding Current:

The current used for welding shall be direct current, reversed polarity.

e) Cleaning:

All slag and flux remaining on any welding shall be removed before laying down the next successive bead.

f) Defects:

Any defects that appear on the surface of any bead of welding shall be removed by chipping, grinding or arc gouging before depositing the next successive bead of welding.

g) Peening:

In general, light peening shall be done only as an aid to cleaning the weld beads. No peening shall be done on the first or the last passes. However, at points of high concentrated welding stress, each bead after the first may be thoroughly peened to the extent that all the ripple marks shall be smoothed out. The cover or wash pass shall not be peened.

h) Treatment of Backside of Welding Groove:

The back side of manual welding grooves shall be back chipped or arc gouged to sound clean metal sufficiently wide to allow free manipulation of the welding electrodes. The backside of the automatic welding grooves need not be back gouged provide a satisfactory qualified procedure has demonstrated 100 % penetration and fusion can be secured without back gouging.

i) Stress Relieving:

All weld joints having plate thickness more than 36mm and manhole openings, bifurcation etc. shall be stress relieved as a whole after welding according to section VIII ASME latest edition or IS:2825 (IS Code for unfired vessels), or other acceptable International Standards. However, material over 32mm thickness shall be pre-heated to a minimum temperature of 200° degree 'F' during welding.

j) Field Welding:

The shop assembled pieces shall be aligned on the site along the alignment. Sufficient finger bars shall be used on circumferential joint to maintain the alignment during the welding.

ii) Mandatory Practice for Welding EHT steel ASTM-A-517 Gr F

The welding of EHT steel requires certain mandatory precaution, when welding with either the shielded metal arc (manual) or submerged arc welding (Automatic Process). In the fabrication and installation of steel liner, welding shall be performed at two different location viz. at the fabrication shop and the installation site. It shall be noted that the site welding operations are performed under extremely unfavourable conditions. This is particularly significant in the case of manual welding which often involves operation inside the tunnel where the humidity may approach 100 percent. In welding high strength steel plates, close care shall be taken to avoid hydrogen, a direct cause of cracking. When low hydrogen electrodes are used, they shall be baked dry and prevented from absorbing moisture. The preheat temperature shall be strictly controlled as also the welding heat input to prevent embrittlement of heat affected zone.

a) Fitting:

EHT steel bent to a true circle shall be fitted with sufficient fitting up equipment and finger bars to properly maintain alignment and gap during welding. Tack welding of joint shall not be allowed.

b) Welding Process:

Longitudinal joint shall be of butt welded type shielded metal arc and submerged arc welding process. Suitable electrodes shall be used to ensure proper and satisfactory welding of joints.

c) Circumferential Welding

When the longitudinal welding is completed, the circumferential joint shall be fitted up with sufficient fitting up equipment and finger bars to maintain alignment during welding.

d) Welding Material

Welding materials shall be taken as per relevant standard specifications and keeping in view any special recommended for welding material specifications storage instructions etc. of steel manufacturer.

e) Maintenance of Welding Electrodes

One of the most important considerations in welding is to preclude hydrogen from the weld metal as much as possible because hydrogen is a

major cause for cracks. The CO₂ and MIG process are particularly suited for this purpose.

However, most steel liners are fabricated and installed using the covered electrodes and/or the submerged arc welding process. Coated electrodes and the fluxes shall be closely controlled so that they shall not absorb moisture from atmosphere.

Covered electrodes shall be re-baked at the job site to a temperature of 400°C for 3 hours in a baking oven and then removed and transferred immediately to storage ovens maintained at 120°C to 175°C before use. Only the amount of electrode that shall be consumed in one hour period shall be removed at any particular time. If the rods are exposed to atmosphere for more than one hour, they shall be redried. The redried shall be done once. As in the case of covered electrode for submerged arc welding, flux shall be carefully maintained particularly when it is to be used on EHT steel. The flux shall be dried for 1 to 2 hrs at a temperature of 250°C in thin layer and agitated. The material shall be kept in a container at 150°C. The flux taken out of the container shall be used as promptly as possible and if it is left outside for more than 60 minutes, it must be redried. The redrying can be done as often as necessary. The reclaimed flux used for welding EHT steel usually contains rust and other impurities. All these impurities shall be carefully removed and the flux shall be redried at a temperature of 400 °C to 500 °C. Redrying must be done only once or twice. The flux that has picked up oil or dirt or which has become fused during previous welding shall be discarded.

f) Nature of welding current

The current used for manual and automatic welding shall be direct current, straight polarity.

g) Preheating

Preheat and interpass temperature of 150° C to 200° C (as may be recommended by plate manufacturer) shall be required and maintained. The preheat shall be uniform and continuous. A gas burner or electric strip heater shall be used for heating the tack welds, longitudinal and circumferential joints in the shop as well as in the field. It is necessary to heat each part over a width of 100mm (4 x t) or more and to maintain satisfactory temperature control by using automatic thermostats. The manufacturer of steel plates may recommend certain procedure with regard to preheating/post heating of weld joints, which shall be strictly followed by the contractor.

h) Welding Techniques

i) Manual Welding:

When manually welded, the arc length shall be held as short as possible consistent with maintaining satisfactory operation. The straight forward stringer bead method shall be preferred for welding of EHT steel. Weaving shall be permissible if a steady arc length is maintained, but the width of the weave shall not exceed three times the diameter of the electrode used in the vertical position and twice the diameter of the electrode used in the down flat position (diameter of core wire). When welding is performed in the vertical position, all beads shall progress from bottom to top, except that the first pass shall be uphill or downhill and the finish or wash beads shall be run from top to bottom using 3.2mm or 4mm dia electrodes using either 2 of 3 stringer beads to cover the uphill passes.

The tack welding of jigs shall also be welded under the same conditions as for regular welding (welding of the main body). The bead length shall be 80mm minimum.

In periods of high wind, the operator and joint shall be protected to prevent the protective gas blanket of the welding arc from being blown away.

No welding shall be performed when water is falling/ dropping on the surface to be welded unless the work is properly protected.

ii) Submerged Arc Welding

In submerged arc welding, penetration is relatively great and the chemical composition of the deposited metal varies widely with dilution of the base metal. For this reason, mechanical properties of crack sensitivity of the deposited metal are easily affected by the speed of cooling. Therefore, in the selection of wire, fluxes, sufficient consideration shall be given to the type of joint, built up method of preheat temperature, interpass temperature welding heat input etc.

iii) Cleaning

In making multiple welds, extreme care shall be taken to remove all slag from the weld beads before starting to deposit subsequent beads. Particular attention shall be given to the removal of thin lines of slag which tend to remain in the crevices along the bead edge.

iv) Defects

Any defects that appear on the surface of any bead of welding shall be removed by chipping, grinding or arc gouging before

depositing the next successive bead of welding.

v) Peening

In general, light peening shall be performed only as an aid to clean weld beads.

vi) Treatment of Backside of welding Groove

The backside of manual welding groove shall be back chipped or arc gouged to sound clean metal sufficiently wide to allow free manipulation of the welding electrodes. The back side of the automatic welding grooves need not be back gouged provided a satisfactory qualified procedure was demonstrated 100 percent penetration and fusion can be secured without back gouging.

vii) Flame Gouging

Flame gouging shall not be permitted as excessive local heating is possible with resulting detrimental effect to the base metal.

viii) Field Welding

The shop assembled pieces shall be aligned on the site along the alignment. Sufficient finger bars shall be used on circumferential joints to maintain the alignment during the welding. No tack weld in the joints shall be permitted. As there is no access to weld the joint from outside in case of pressure shaft only inside welding is contemplated with back up strip.

ix) Preheating and Interpass Temperature

Preheating and interpass temperature shall be 150° C to 200° C.

x) Method of preheating

Electric strip heaters with automatic thermostat controls shall be used for recording the temperatures. Alternatively, gas burners shall be used for preheating, if plate can be uniformly heated and to maintain satisfactory temperature control when thermostats are not available, frequent use of crayons is required.

xi) Welding Technique

The field circumferential joints shall be welded manually by covered electrodes. The conditions of maintenance of electrode and the procedure of welding shall be similar to the manual welding performed at the shop.

In the case of embedded type steel liner, where the welding work is liable to be carried out in highly humid tunnels, the chances of delayed cracking of welds is apt to be more easily induced by hydrogen. To prevent weld cracks, stringent control of preheating temperature, heat input and electrode shall be practised.

Multipass welded joints of this type have a high possibility of cracks occurring in the root pass. Cracks of this type can be removed by the application of continuous welding. This kind of crack is likely to occur when temperature is under 150° C and when hydrogen contained in heat affected zone is high. In the case of continuous welding, however, it shall take some what longer time before the temperature is lowered to 150° C or under. During this period, hydrogen contained is removed and the possibility of crack occurrence shall be thereby eliminated. Welding shall be applied continuously as far as practicable. The heat input and interpass temperatures shall be followed strictly and no deviation shall be permitted.

1.10.3

Qualification of Welders

All welders assigned to manual welding shall have successfully passed the test conducted by the contractor as prescribed for welder qualification in IS: 2825 or section IX of ASME Boiler and Pressure Vessel Code. If in the opinion of the Engineer, the work of any welder becomes at any time or appears questionable; such welder shall be required to pass another qualification test.

1.10.4

Welding Procedure Qualification

- i) When considered necessary by the Engineer, the welding procedure qualification test shall be undertaken. The aim of this qualification is to confirm the choice of the filler metal and of the welding process for a well-defined base material (steel plate) and to make sure that the final features of welded joint reach the guaranteed values to the satisfaction of the Engineer.
- ii) Qualification of the welding procedure shall take place before manufacture and erection begins. It shall relate to every quality of steel and every welding process provided for. It shall be done under the same conditions as those prevailing during manufacture, such as, for instance shape of chamfers, work preliminary to welding, number of runs, position preheating, annealing etc.
- iii) As a general rule, a test plate shall consist of two strips (about 400mm x 800 to 1000mm) welded edge to edge in the longitudinal direction. Its thickness shall be approximately equal to the greatest typical wall thickness for the steel or the welding process provided for. This test plate

shall be treated in the same manner as the shop or erection welds.

- iv) Inspection shall be carried out for the following or as directed by the Engineer.
 - (a) 100 percent radiography or/and ultrasonic test.
 - (b) One tensile test, test specimen with parallel faces.
 - (c) One bending test weld ground flush-direct bending.
 - (d) One bending test weld ground flush-reverse bending.
 - (e) One tensile test of filler metal (cylindrical test specimen).
 - (f) One series of test specimens to determine the full impact value on the outer fibres and in the core.
 - (g) One impact test in the transition zone (3 test pieces).
 - (h) One test to determine the differences of hardness (base metal, outer fibres transition).
 - (i) One chemical analysis of the deposited metal.
 - (j) One microscopic examination.
 - (k) One micrographic examination (plate, transition weld).
- v) If required, for weld ability of base materials and filler metal, additional test like X-Groove Restraint cracking Test, Diffusible Hydrogen Test etc. shall be conducted.

1.10.5

Production Welding Tests

- i) During production, the contractor shall when directed by the Engineer carry out production tests on welded joints to:-
 - a) Monitor the soundness and properties of welds on a routine basis.
 - b) Confirm that new batches of welding consumables produce welds with mechanical properties and soundness in accordance with the specifications.
- ii) The production test welds may be run-on run-off tabs or separate test plates which simulate as closely as practicable to the production weld being checked. The size of the production test plates shall be as indicated in para iii)-(c) here-in-below. All production test plates shall be welded in the presence of the Engineer or his authorised representative.

- iii) Production test weld plates shall be welded at approximately the following frequency :
 - a) 1 test weld per 100m of longitudinal welds in the steel liner shells welded by automatic processes.
 - b) 1 test weld per 200m of circumferential welds in the steel liner shells welded by automatic processes.
 - c) 1 test weld per 100m butt welds welded by manual or semi-automatic processes.
- iv) In general the frequency shall be greater than average at the commencement of each welding procedure and shall be arranged to test new supplies of consumables, electrodes, welding wire and flux, as their use is commenced in production welding.
- v) The production test weld plates shall be radiographically examined to ensure that the standard of welding is atleast equal to that required in production. The test plate shall be rejected if rectification is required for more than 5 per cent of the weld length. Production weld test plates shall be sectioned for mechanical testing in the same manner as procedure test plates. Production weld test plates shall provide a minimum of 900mm effective weld test length with the weld centrally placed in a 400mm wide plate. If the mechanical tests or radiographic examination of a production test weld shows that the weld does not comply with the minimum standard required for a procedure weld, then that welding procedure shall be disqualified and further welding with that procedure shall not be permitted. The procedure shall be resubmitted for re-approval when the cause of the failure of the production weld has been determined by the contractor. The failure of the test weld to comply shall not in itself be grounds for the rejection of production welds performed in accordance with the approved weld procedure prior to the failure of the test weld.

1.10.6

Workmanship

- i) All steel liner assemblies and specials shall be manufactured and finished in a thorough workman like manner equal to the best modern Engineering practice in the manufacture and fabrication of steel liner components notwithstanding omissions, if any, in the specifications and the approved drawings. Dimensions shown on the drawings shall be adhered to closely limiting to the maximum tolerance specified in the relevant standards.
- ii) Where finished surfaces are specified or required for parts or materials, they shall be smooth as specified and almost free from tool marks.

- iii) Wherein average surface is required, smooth surface shall be produced but slight tool marks shall be allowed.

1.10.7

Repair of Welds

- i) Defects in weld such as cracks, pinholes, incomplete fusion penetration or porosity detected as a result of radiographic/ultrasonic inspection shall be removed by chipping or any other mechanical means or by oxygen grooving, gouging, until sound metal is reached on all sides of the weld. The resulting cavity shall then be filled solidly with weld metal deposit strictly as per the welding procedure specified in para 6.9 of IS: 2825. Portions of welds that have been repaired shall be radiographed/ultrasonic tested and repaired till the defects are removed to the satisfaction of the Engineer.
- ii) All area of welds on which repairs have been made shall be examined 100 percent by the method specified for the original weld.
- iii) When a weld has been examined for 100 percent of its length and the examination shows many unacceptable defects distributed over its length or when the defects envisage need for rectification of more than 25 percent of the weld length, the entire weld length may be rejected and the weld cut out and re-welded and shall be re-examined by the method specified for the original weld.

1.10.8

Recommendation from Steel Suppliers

- i) The contractor shall note that steel supplier may recommend certain procedures/precautions in respect of fabrication and erection of steel liner, which he shall follow. If special type of electrodes and special processes such as preheating and post heating etc. are recommended, such electrodes shall be procured and shall be used according to the instructions of the manufacturer of the steel plates.
- ii) The latest statistics of welding shall be followed even if the manufacturer of steel plates does not furnish any assistance contemplated in above para.

1.11.0

Non-Destructive Tests

The non-destructive tests shall be carried out as specified in SNT-TC-IA "Recommended practice for non-destructive testing, personnel qualifications and certification" of the American Society for Non-destructive Tests or other similar International Standards.

1.11.1

Radiographic and Ultrasonic Inspection

- i) Radiographic examination

- a) Radiography shall be performed in accordance with ASME Boiler and Pressure vessel code Section-V Article-2. The image quality indicator shall be of wire type and the sensitivity shall be atleast 1.5 percent or better. All radiography shall be conducted using lead intensification screens. The acceptance standard for radiography shall be as stated in para (f) below.
- b) All radiography shall be performed and supervised by the experienced personnel qualified or trained for the job from the institutes such as Bhaba Atomic Research Institute or other reputed Institute of Non-destructive examination.
- c) Prior to making radiography, identification markers shall be placed adjacent to the weld intended to be radiographed. The images of such markers shall clearly appear in the radiographs. It shall be ensured that actual weld and its radiographs are mutually identifiable upto completion and acceptance of the work.
- d) The contractor shall provide at his own expense all materials including radiographic films and all consumables, equipment etc. necessary for radiographic examination and shall perform all radiographic examination in accordance with the requirements of this specification and of the Engineer and shall submit all the films duly developed to the Engineer within 8 working hours after taking the exposure. The films will then become the property of the Employer.
- e) Alongwith each radiograph, the contractor shall furnish his interpretation report, in duplicate, in the proper proforma. The Engineer shall be free to make independent interpretation and ask for the repairing of welds, if any necessary.
- f) Sections of welds the radiograph of which show any of the following types of imperfections shall be judged unacceptable.
 - Any type of crack, or zone of incomplete fusion or penetration;
 - Any elongated slag inclusion which has length greater than $1/3 t$, where 't' is the thickness of the weld;
 - Any group of slag inclusions in line that have an aggregate length greater than 't' in a length of $12t$ except when the distance between the successive imperfections exceeds $6L$ where 'L' is the length of the longest imperfection in the group ;
 - Porosity or rounded indications in excess of that specified by the acceptance standards given in Appendix-IV of ASME Boiler and pressure vessels code section-VIII Div.1.
- g) Radiographs shall not be taken until 24 hours after welding has been

completed.

- ii) Ultrasonic examination
 - a) Ultrasonic examination shall be performed in accordance with the Article-5 of ASME Boiler and pressures vessels code Section V. The relevant references from ASTM specification E-164-74 shall be also taken. The ultrasonic examination shall be performed and supervised by experienced and qualified personnel. If necessary special type of transducers and/or higher test frequency etc. shall be adopted to improve the reliability of the examination. The equipment with recording facility shall be used for ultrasonic examination. The records in such case shall be furnished and the same shall be the property of Employer.
 - b) All indications which produce a response greater than 20% of the reference level shall be investigated to the extent that the operator can determine the shape, identity and location of all such reflectors and evaluate them in terms of the acceptance standard given below:
 - Discontinuities shall be unacceptable if the amplitude exceeds the reference level and discontinuities have length which exceeds $1/3t$ where 't' is the thickness of the weld being examined.
 - Where discontinuities are interpreted to be crack, lack of fusion or incomplete penetration, they shall be unacceptable regardless of discontinuity or signal amplitude.
- iii) The marker shall not be removed until all the welds have been accepted.
- iv) Defective welds shall be arc air gouged or chipped out, re-welded, re-X-rayed and the cycle repeated until satisfactory results are obtained.
- v) Radiographic/ultrasonic tests shall be conducted as per table given below:

Type of joints	Shop testing	Field testing
a) All longitudinal joints.	100 percent X-ray	-
b) Circumferential Joints, of ASTM- 537 Class 2 or ASTM-A 517 Gr. F	100 percent X-ray	100 percent Ultrasonic testing (accessible field Circumferential joints shall be 100 per cent X-ray Examined.)

Butt joints in anti-percolation and stiffener rings shall be examined ultrasonically as directed by the Engineer. Atleast one joint shall be

examined for each ring.

1.11.2 Magnetic Particle Inspection

All fillet welds joining diaphragm plates, rings, lugs, etc. shall have smooth transitions into the sides of plates with toes of the welds made before depositing the major bead. The surfaces shall be ground to merge smoothly into the plate surfaces. The fillet joints are subjected to magnetic particle testing. The procedure of carrying out the above test shall be as per relevant standards. Where magnetic particle testing is not possible, dye penetration test shall be undertaken as per appendix-8 of ASME Code Section VIII with the approval of the Engineer.

1.11.3 Additional Examination

- i) The Engineer may direct the use of visual, dye-penetrant, magnetic flux and ultrasonic methods and equipment to supplement the radiographic examination. These additional methods will be used to ensure that welds do not contain unacceptable defects as defined in sub-clause 1.11.1(i) herein above.
- ii) The contractor shall make available continuously throughout the contract technician and all equipments necessary for ultrasonic examination of the welds. The Engineer will direct which welds are to be examined.

1.11.4 Hydrostatic Testing

- i) Hydrostatic shop testing shall be conducted in shop Details of the testing procedures, tests jig etc. and test beds to be used shall be furnished to the Engineer for approval.
- ii) All the pipe shells, bends, wye pieces, taper pieces etc. shall be in general subjected to test pressure equal to 150 percent of the design pressure producing stress not exceeding 90 percent of yield stress in shell.
- iii) In the case of extra high tensile steel liner using ASTM-517 Gr. 'F' or equivalent, a test pressure which produces a hoop stress in pipe shall be equal to $\frac{1}{2}$ the minimum UTS of the materials or $\frac{3}{4}$ yield point of the materials, whichever is less, shall be adopted.
- iv) During testing, each piece shall be subjected to a test pressure as indicated on the drawings.
- v) Suitable vent(s) shall be provided at a high point to vent possible air pocket while the Pressure Shaft shells, bends, bifurcations etc. are being filled.
- vi) The test pressure shall not be applied until the steel liner section and its contents reach the same temperature which shall preferably be not less

than 15° C.

- vii) Before applying pressure, the equipment shall be inspected to see that all joints are leak proof and to ensure that all low pressure filling lines and other appurtenances that shall not be subjected to the test pressure, are disconnected.
- viii) After being completely filled with water, the pressure in steel liner assembly to be tested shall be increased slowly and uniformly until the specified test pressure is reached.
- ix) The test pressure shall be applied three times successively increasing and decreasing at uniform rate but not lowering the pressure below 0.75 times the operating pressure and shall then be held at the specified test pressure for such a time as is considered sufficient for inspection of plates, all welded joints and connection and all regions around openings but the period shall in no case be less than ten minutes.
- x) All defective welded seams and all defects in steel plates discovered during the hydrostatic pressure test shall be marked and after draining out the water they shall be satisfactorily repaired.
- xi) After repair and radiography, all sections shall again be subjected to a hydro-static pressure test. This procedure shall be repeated till satisfactory results are obtained throughout.

1.11.5

Inspection Trolley

- i) The contractor shall design, manufacture, paint, transport and supply one no. inspection trolley intended for facilitating inspection of completed pressure shaft from within during maintenance needs.
- ii) The trolley shall be capable of being dismantled and taken through the 600mm dia. manhole and assembled inside the pressure shaft. The trolley shall have a capacity to carry 5 tonne load. The design shall be with a factor of safety as may be agreeable to the Employer design organisation. The trolley shall be duly equipped with suitable lifting hooks or sheaves. The trolley may have arrangement like brackets or so for mounting battery operated flash lamp and for mounting portable radio-inter-com. The contractor shall prepare and submit detailed design and drawings of the inspection trolley to the Engineer for necessary approval. The work shall be carried out as per approved design. The contractor shall install and give trial operation test of trolley upon completion of pressure shaft as may be directed by the Engineer. The trolley shall be dismantled after commissioning and stored properly in a safe place in the custody of Employer after repainting.
- iii) The contractor shall also supply and install necessary winches for penstock, control panels and other accessories for operating the trolley

at a suitable place to be proposed by the contractor and approved by Engineer.

- iv) The trolley may also be used for painting the interior surface of the penstock/pressure shaft after filled welding with the approval of Engineer, in which case the testing and commissioning and dismantling/ storage shall be suitably rescheduled to the satisfaction of Engineer.

1.12.0 Painting

1.12.1 General

All steel liner assemblies shall be cleaned and painted as hereinafter specified.

- i) Machined surfaces and screw threads to be in rolling or sliding contact shall be shop coated with a rust preventive compound before transportation.
- ii) Outside surface shall be painted in shop with cement solution.
- iii) Inside surface shall be coated in shop with zinc rich epoxy primer and cold applied, coal tar epoxy paint.
- iv) Completed coatings shall, in all respects, conform to the detailed requirements of these specifications.

1.12.2 Painting Schedule

Cleaning and painting of steel liner shall be done in accordance with following schedule:

Item	Paints or coating material	Total No. of coats (in shop or field)	Dry film thickness of paint coats
i) External surfaces which are embedded in concrete.	Coat of cement solution mixed with 5% potassium dichromate.	1	-
ii) Exposed surface of liner, if any, in adits etc.	a) Zinc rich epoxy primer	2	Each coat Minimum of 50 microns but total not more than 150 microns

		b) Cold applied, coal tar epoxy paint	3	450 (3x150) microns
iii)	Interior surfaces	a) Zinc rich epoxy primer.	2	Each coat minimum of 50 microns but total not more than 150 microns
		b) Cold applied coal tar epoxy paint	3	450 microns

1.12.3

Preparation of Surfaces for Painting

- i) Weld spatters, burrs or any other objectionable irregularities shall be carefully removed or repaired by suitable means before cleaning
- ii) Any grit or dust remaining from the cleaning operation shall be completely removed from the surfaces by brushing, air blowing, suction or other effective means before the surfaces are accepted for painting.
- iii) In the event of rust formation or when the surfaces become otherwise contaminated in the interval between cleaning and painting, re-cleaning shall be required to be done.
- iv) Surfaces preparation shall be in accordance with the method given below:

All oil, grease and dirt shall be removed from the surface by the use of clean mineral spirits, xylol or white gasoline followed by wiping with clean wiping materials, except that for surfaces, which require coal tar coatings, the cleaning solvent shall be xylol.

Following the solvent cleaning, the surface to be painted shall be cleaned to base metal to remove all rust, mill scale and other tightly adhering objectionable foreign materials by sand blasting or grit blasting. A clean, dry, gypsum and salt free quartz sand having grain size 0.7 to 1.5mm shall be used for sand blasting. Blast cleaning shall be accomplished with abrasives of such particle shape, hardness and gradation as to effectively clean the metal and have roughened surface suitable for tenacious adhesion of subsequent coating. The surfaces which have been thus cleaned shall be primed as soon as practicable after such preparation has been completed, but in any event prior to deterioration of the prepared surface.

1.12.4

Application Procedure and Quality Control of Paints

- i) Paint and coating materials to be applied shall be in a thoroughly mixed condition at the time of application and shall not be thinned except where hereinafter specifically provided.
- ii) Paint shall not be applied when temperature of the steel surface to be painted is less than 3° C above the dew point or when the weather is frosty/foggy or when the relative humidity is enough to cause condensation on the surfaces to be painted.
- iii) Paint shall be applied by airless spraying or brushing. The contractor shall make available on site necessary equipment to measure the thickness of painting coats.
- iv) Suitable means shall be provided to prevent segregation during the painting operation.
- v) Each coat of paint shall cover completely and uniformly the surface being painted and shall be free from runs, sags and blisters.
- vi) Except as otherwise specifically provided, each coat shall be allowed to dry or harden sufficiently before a succeeding coat is applied.
- vii) Coverage, application and preparation of various paint materials shall be as follows:
 - a) **Rust Preventive Compound:**

Rust preventive compound shall be applied by any convenient method which shall ensure coverage of the surface with a heavy uniform coating not less than 0.4mm thick.
 - b) **Cold Applied Coat Tar Epoxy Paint:**

The contractor shall specifically furnish brand, name of paint and the details of the relevant specifications or accepted standard practice for application procedure. Primer drying time, before first coat of epoxy paint can be given, shall be indicated. Similarly drying time between each successive coat of epoxy paint and its final curing time for a well bonded film as recommended by the manufacturer of paint shall be indicated. Quality/life of this paint after application shall not deteriorate at any ambient temperature from 5°C to 75° C.
 - c) **Zinc Rich Epoxy Primer:**

Zinc rich epoxy primer shall be applied in two coats by brush or by spray over sand blasted surface. The zinc rich primer shall be stirred properly at regular intervals during applications. Thinning of zinc paste shall be

permitted but only with suitable fluid, as directed by the Engineer. The addition of suspension fluid shall not exceed 15 percent. The second and subsequent coats or primer shall not be applied earlier than 24 hours after the application of previous coat.

1.12.5

Cleaning and Repair of Shop Painted Surfaces

Metal works painted in shop or field shall be handled with care so as to preserve the coatings in best practicable condition. Before proceeding with the regular painting or coating operation, the contractor shall clean and repair all areas of shop coat which are defective or damaged areas that are loose, weakly bonded, blistered, abraded, rusted or otherwise defective shall be removed to clean metal by scraping, chipping, power wire brushing or other effective means. Areas, thus prepared shall be cleaned of all dust, dirt and other contamination using clean rug and clean solvent. These surfaces shall then be repainted in accordance with the painting schedule and shall be required to pass acceptance tests as specified.

1.13.0

Transportation

1.13.1

Dispatch and Transportation

- i) The transportation of the fabricated shells and accessories from the shop to the site of erection shall be started only after obtaining approval of the Engineer.
- ii) The safe transport and handling of the steel liner from workshop to the site and from Site store, if any, to the work site shall be done by the contractor. He shall deploy suitable transportation and handling equipment such as lorries, loading and unloading hoists, winches, rails, steel rope, jacks etc.
- iii) The contractor shall include and provide for spiders, saddles or supports, etc. for securely fastening and protecting the steel liner assemblies in transit so as to avoid any damage to the liner or to the paint done in shop.
- iv) The contractor shall be fully responsible for all loss and damage caused by or occasioned by any defect in handling or transportation.
- v) All exposed finished surfaces shall be adequately protected against abrasion during transport.
- vi) Defects, if any, caused to the pipe courses or painting during transportation and handling shall be rectified by the contractor to the satisfaction of the Engineer.

1.13.2

Match Marking and Weight

- i) Each part of the steel liner or other auxiliary assemblies shall be legibly marked to show their relative position in the finished marking on each assembly to show top of field/shop vertical, the direction of flow and the serial number shall be made with light steel stamps.
- ii) The approximate weight of each piece or assembly to be despatched shall be painted as well as indicated in tags attached to the assembly.
- iii) A list of the weight of assemblies/components despatched by the contractor from shop to the Site of erection shall be submitted to the Engineer simultaneously.
- iv) In case of high strength quenched and tempered steel, the marking operation which is normally conducted with size rulers, templates, punches and chisels shall not be used.

1.14.0

Erection

1.14.1

General

- i) The steel liners shall be assembled and installed in place inside the tunnel accurately to line and grade as shown on the drawings, and as directed by the Engineer.
- ii) After successful erection of steel liner assembly/assemblies as per approved drawings, concreting and grouting etc. of steel liner shall be done before erection of next assembly is undertaken.
- iii) Any timber supports provided for supporting the steel liner shall be removed by the contractor before concreting is undertaken and shall not be permitted to be embedded in concrete.
- iv) The contractor shall deploy sufficient crews or skilled and unskilled workmen and equipment so that erection of liner and concreting are carried out simultaneously.

1.14.2

Erection Procedure

- i) Rail Track:

The contractor shall install and maintain a rail track to move and to position the pipe sections and leave the rails embedded in secondary concrete with the approval of Engineer, provided the rails are supported on steel pieces.

Finger bars and other temporary supports shall be installed in such a way

that no deformations are induced on the pipe.

- ii) Alignment and Welding:
 - a) The steel liner shall be installed on Site in correct grade and alignment.
 - b) The responsibility for accurate alignment and erection of shells, wyes and bends etc. with reference to the control points rests with the contractor.
 - c) Any defects in the alignment of the steel liner shall be rectified by the contractor.
 - d) Sufficient finger bars shall be used on circumferential joints to maintain the alignment during the welding operation.
 - e) No tack welding shall be allowed in case of pressure vessel quality, high strength quenched and tempered steel.
 - f) Field welding inside the steel liner shall be done with back up strip on the outer surface at the joint.

1.15.0

Tolerances

The tolerances in the alignment and shape of the erected steel liner shall be as mentioned below or specified in other acceptable International Standards.

- i) Out of straightness of the shell shall be less than $2L/1000$ for the total cylindrical length
- ii) The difference between the maximum and the minimum diameter at any cross section of the erected cylindrical length shall be within the limits specified in Para 1.8.12 hereof.
- iii) For single welded butt joint with backing strip and double welded butt joint with double 'V', the minimum separation of edges of shells to be welded shall not exceed 10mm and 3mm respectively unless otherwise directed by the Engineer.
- iv) The maximum extra inner and outer thickness of welding shall be less than 3mm.

1.16.0

Cleaning and Painting in the Field

After erection, concrete back filling and grouting, all temporary fixtures/appurtenances, debris etc. inside the steel liner shall be carefully removed. Atleast 200mm wide strip of pipe along the field welded joints shall be thoroughly cleaned before painting. The same treatment shall be required at the spots where bars or other temporary steel pieces were

installed to facilitate erection of steel liners. The entire interior surfaces of steel liner shall be cleaned and painted as per specifications laid down in para 1.12.0 hereof.

1.17.0

Drawings Appended to the Bid Documents

The drawings enclosed with the Bid Documents are made a part of the specifications for facilitating the prospective bidders in the preparation of their bids for the work covered under these specifications.

These bid drawings are preliminary and not exhaustive and for bidding purpose only subject to improvements/ revisions. Fabrication and erection of steel liner assemblies and accessories shall be done on the basis of fabrication/erection drawings approved by the Engineer. Such fabrication/erection drawings shall be prepared by the contractor and shall be based on the construction drawings issued by the Engineer with additions/alterations and modifications, if any, from time to time during execution of the contract.

1.18.0

Materials

The materials used in the fabrication and erection of the steel liner shall comply with the specifications as laid down under para 1.4(i)(a) of these specifications. Where materials are not specifically covered by detailed material specifications, the contractor shall furnish the best available commercial grades of materials or articles to the satisfaction of the Engineer.

1.19.0

Quality Control and Inspection

1.19.1

General

- i) The contractor shall maintain a quality control system to the satisfaction of the Engineer which shall establish that all requirements of these specifications including material, fabrication and inspection are fulfilled during fabrication and installation of the steel liner inside the tunnel. This is very important in view of use of Extra High Tensile quenched and tempered steel. The site welding inside the tunnel may have high humidity in addition to difficult working space and ventilation problems. Procedures have to be established to thoroughly implement preheating and post heating, requirement of welds, to facilitate installation work inside the tunnel. The steel liner assemblies need to have required accuracy to reduce defects like circularity, misalignment, angular distortion etc. Procedure of check sheets and inspection records shall be adopted to ensure the quality control as per these specifications. Check sheets and inspection records shall include the following, in addition to

any other requirements considered necessary by the Engineer.

a) At Fabrication shop:

- Check sheet for gas cutting
- Check sheet for bending
- Inspection report on shop fabrication
- Check sheet for fit-up.
- Check sheet for material check
- Check sheet for dimensions
- Check sheet for hydrostatic testing
- Radiographic testing records

b) At Site shop inside the tunnel

- Check sheet for each pipe assembly
- Check sheet for level and alignment
- Quality control sheet for welding consumables
- Ultrasonic/radiographic testing records
- Quality control sheet for repair welding
- Inspection report on painting
- Inspection report on final dimensions

ii) The contractor shall also follow recommendations, if any, of steel plate manufacturers to ensure quality in welding and erection.

iii) Operation of check sheets shall be as follows:

Site	Sheet	Recorder	Confirmer	Final Confirmer
Fabrication shop	Check sheets	Worker of the contractor	of Fabrication staff of contractor	Engineer

	Inspection recorders	Inspector of the contractor	Q.C. staff of contractor	-do-
Site Shop	Check sheets	Worker of the contractor	Fabrication staff of contractor	-do-
	Inspection recorders	Inspector of the contractor	Q.C. staff of contractor	-do-
Installation Site in tunnel	Check sheet	Worker of the contractor	Fabrication staff of contractor	-do-
	Inspection records	Inspector of the contractor	Q.C. Staff of contractor	-do-

1.19.2 Record Retention

The contractor shall have a system for maintenance of radiographs/ultrasonic testing register and manufacturer’s data reports to the satisfaction of the Engineer.

1.19.3 Temperature and Humidity Control

Necessary temperature and humidity control shall be maintained during the welding operation in shop as well as in field to the satisfaction of the Engineer. In field, extremely unfavourable conditions like low temperature and high humidity may prevail particularly in case of pressure shaft. Therefore, particular care shall be required to be taken during welding operations in field. For field welding, particularly of extra High Tensile steel liner assemblies inside the tunnel, special care shall be necessary to ensure that absolutely no water is entrapped due to any seepage inside the tunnel, since low hydrogen electrodes are used for welding.

1.19.4 Guarantees and Inspection of Plates

The manufacturer of the pressure vessel steel plates to be used for fabrication of steel liner shells and specials etc., shall be asked by the contractor to furnish necessary mill test certificates etc., in respect of plates to be supplied by them conforming to ASTM-A-537 class-2 and 517 Gr. 'F', 'E'/'Q' or equivalent international standards etc. and make necessary recommendations with regard to matching filler wire/welding electrodes, pre heat temperature, heat input control and post weld heat

treatment etc.

The contractor shall examine completely each plate for its soundness in respect of any incipient defects e.g. indentations, roll marks, laminations and projections etc., and use the same for fabrication only after completely satisfying himself that each plate is suitable for undertaking fabrication and necessary testing thereafter. Overall responsibility for quality control for proper fabrication, erection testing, etc. shall ultimately lie with the contractor.

1.19.5 Inspection/Checking of contractor's work

The contractor shall provide to the Engineer in shop as well as in field, all labour, material instruments and apparatus etc., for checking and testing of work being done or completed by the contractor. Any defects coming to the notice of the Engineer shall be rectified by the contractor till satisfactory results are achieved. Necessary record for such tests or checking of work at various stages of fabrication, erection, and painting and testing shall be maintained by the contractor duly signed by the Engineer.

However, this checking of work at various stages, tests tolerances, level etc., by the Engineer, shall not be held to relieve the contractor of any part of contractor's obligation to meet all the requirement of these specifications and drawings, or responsibility for correct fitting and satisfactory operation of the equipment.

1.19.6 Acceptance Tests and Warranty

- i) After completion of erection, the steel liner shall be filled with water and its stability and tightness at accessible locations, if any, shall be thoroughly checked to the entire satisfaction of the Engineer.
- ii) The acceptance, however, shall not in any way absolve the contractor of his responsibility for any damage that may occur to the steel liner or its accessories within the maintenance period.

1.20.0 Measurements and Payments

1.20.1 Straight Shells, Bends, Wyes and Reducers

- i) The measurement for payment and payment for design, supply, fabrication, delivery, hydrostatic testing of the steel liner components namely straight shells, bends, wyes and reducers will be of the length, diameter and thickness of the straight shells, bends, wyes and reducers. The weight of these shall then be computed using weight per m³ of steel as specified in relevant codes.

- ii) The measurement for payment and payment for installation and erection of the steel liner components namely straight shells, bends, wyes and reducers will be of the length, diameter and thickness of the straight shells, bends, wyes and reducers. The weight of these shall then be computed using weight per m³ of steel as specified in relevant codes.
- iii) For the purpose of calculating the weight of the straight reaches of the steel liner, finished lengths of the steel liner including welds will be measured and then weight calculated on the basis of sectional measurements. In such straight reaches where manholes have been provided, deduction will be made for the weight of the plate cut for the manhole opening.
- iv) For bend, the length along each axis of the curve will be measured and weight calculated there from. Payment for fabrication, delivery, hydrostatic test and erection of the steel liners will be made at the Unit Rates per MT entered in the Bill of Quantities.
- v) Unit Rates will include all costs associated with fabrication and delivery to the storage area, erection including the cost of furnishing all paints, equipment, staging, hauling and storage facilities and services, welding of all joints in the pipe shell which makes up the components of the steel liners and corrosion protection of the external surfaces. These units rates will also include the cost of all materials, construction facilities, profession and technical services, transport, equipment, labour, assistance in testing and other necessary charges.

1.20.2

Stiffener Rings, Thrust Collars and Backing Strips

For the purpose of calculating the weight of the stiffener rings, thrust collars and backing strips, the thickness, the inner and the outer diameters will be measured.

1.20.3

Manholes

- i) The weight of the manholes will be calculated on the basis of the sectional measurement. For purpose of calculating the weight, the height of the nozzle will be measured at two points, one along the longitudinal axis of the steel liner and the other at right angles to it, and the average of two will be the height of the nozzle. While calculating the weight, no deduction will be made for bolt holes. In case it is not possible to calculated the weight of manhole by sectional measurements, the actual weight of the finished manhole will be taken at the fabrication shop after due calibrations in the presence of the Engineer.
- ii) The nuts, bolts and gaskets, although to be supplied and fixed by the contractor, will not be paid extra.

1.20.4 Ring Girder Supports

The weight of the ring girder supports will be calculated on the basis of the sectional measurement of each component such as ring girder, spacer plates, columns, flanges, sole plates etc. alongwith all the accessories. While calculating the weight no deduction will be made for bolt holes. In case it is not possible to calculate the weight of ring girder supports by sectional measurement, the actual weight of the finished ring girder supports alongwith accessories will be taken at the fabrication shop after due calibrations in the presence of the Engineer.

The nuts, bolts and gaskets etc. although to be supplied and fixed by the contractor will not be paid extra.

1.20.5 Reducers and Matching Pieces

The weight of the reducers will be calculated on the basis of the average of the mean diameters at both sides of the reducers. The weight of the matching pieces between two different thicknesses will be calculated on the basis of average thickness.

1.20.6 Rails

The measurement for payment for supply, handling and erection of the rails inside the Pressure shafts for facilitating erection of steel liner and other works will be of the weight of rail actually installed and approved by the Engineer. Payment will be made at the Unit Rate per metric tonne entered in the Bill of Quantities.

1.20.7 Bulkhead

No separate measurement and payment shall be made for design, fabrication, supply and erection of the bulk head as these shall be provided to facilitate the hydrostatic testing of bifurcations. The contractor shall include its rates in the Unit Rate per MT of steel liner entered in the Bill of Quantities.

1.20.8 Radiographic & ultrasonic Examination

- i) The measurement for payment of radiographic examination directed by the Engineer will be made of the actual length of the following welds as shown on the drawings or directed by the Engineer.
 - a) Weld procedure test plates
 - b) Production weld tests
- ii) The payment for radiographic examination will be made at the Unit Rates

per metre entered in the Bill of Quantities.

- iii) The cost of ultrasonic, dye penetration or magnetic particle inspection of weld, as directed by the Engineer ,shall be deemed to be included in the unit rate for ultrasonic examination entered in the Bill of Quantities.

1.20.9

Corrosion Protection

No separate measurement for payment for the supply, surface preparation, application of the interior painting for the steel liner will be made of the surface area painted. The contractor shall include cost of above in the unit rate per MT of steel liner entered in the Bill of Quantity (Price Schedule).

The cost of de-scaling and supply and application of the cement work will be deemed to have been included in the cost of the component to which it is applied.

1.20.10

No Measurement for Payment or No Payment will be made for the Following:

- i) Any Steel liner assembly(s) or components thereof transported without obtaining the approval of the Engineer, shall be at the contractor's own risk and costs.
- ii) Any steel shells or accessories thereof damaged during transportation, handling or erection in the tunnel shall be replaced or if approved by the Engineer, repaired and re-erected by contractor without any extra cost to Employer.
- iii) Temporary supports installed by contractor for his convenience and safety of his workmen/equipment during fabrication, transportation and erection of steel liner assemblies and their components.
- iv) Any type of temporary steel support to be finally embedded in the concrete and Replacement of any defective materials or work.
- v) The welding operation performance qualification test (i.e. welding, radiographic examination and weld repair etc.) of the welder.
- vi) Design cost for items of Pressure Shaft Steel Liner as it is already approved vide drawing no. ARUN-III HEP/PSL/1200 (sheet 1 & sheet 2), ARUN -III HEP/PSSL/1218A (sheet 1, sheet 2, sheet 3 & sheet 4) , ARUN-III HEP/PSSL/1217 & ARUN-III HEP/PSSL/1239 except for inspection trolley ,Reducers, Manholes and Ring Girder Support.
- vii) Any fabrication or erection work commenced prior to the approval of the relevant shop/field drawings by the Engineer shall be at the contractor's

own risk and cost.

- viii) The costs of all equipments, labour, materials etc. and all costs of carrying out mechanical testing for production welding tests as per these specifications shall be borne by the contractor and shall be deemed to have been included in the rates tendered for the relevant items in the Bill of Quantities. The record of the production tests shall be furnished in a proper proforma. The radiography of production weld test plates, which meet the requirements, shall be, however, included in the measurement for payment.

1.21.0

Work and Safety Regulations

Refer Section-A Chapter-2 of Technical Specification.

Section: A

CHAPTER -2

Work and Safety Regulations

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2.0.0 Work and Safety Regulations

2.1.0 Safety Engineering

Accident prevention shall be an essential part of the programme of the Contractor for the Work under this Contract, in order to reduce the cost of construction, measured in terms of:

- i) Human life sacrificed.
 - ii) Temporary and Permanent injuries to workers.
 - iii) Loss of materials resulting from accident.
 - iv) Loss or damage to equipment.
 - v) The cost of Workmen's Compensation Insurance.
 - vi) Loss of time due to accident.
- a) The Safety programme should be so developed, so as to cope up with particular hazards for each operation (blasting, drilling, excavation, transport, cutting of metals, welding, fabricating, handling, erecting, testing and commissioning).
- b) The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to Employer or to others, working at or near the site. The Contractor shall also be responsible for provisions of all safety notices and safety equipment, fire fighting equipment, first aid etc. required both by the relevant legislations and the Employer as he may deem necessary.
- c) The Contractor will notify well in advance to the Employer of his intention to bring to the Site any Container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The Employer shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Employer shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by the Employer. Nor the Employer shall entertain any claim of the Contractor towards additional safety provisions/ conditions to be provided for/constructed as per Employer's instructions.
- d) Further any such decision of Employer shall not, in any way, absolve the Contractor of his responsibilities, and in case, use of such a container or entry there of into the site area is forbidden by Employer, the Contractor shall use alternative methods with the approval of Employer without any cost implication to Employer or extension of work schedule.

- e) Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying out such provision and/storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act 1948, and Petroleum and Carbide of Calcium Manual Published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Employer. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.
- f) All equipments used in construction and erection by Contractor shall meet Indian, International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipments shall be strictly operated and maintained by the Contractor in accordance with manufacturer's operation manual and safety instructions and as per Guidelines/Rules of Employer in this regard.
- g) Periodical Examinations and all tests for all lifting/hoisting equipment & tackles shall be carried out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated laws/ Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by Employer or by the person authorized by him.
- h) The Contractor shall be fully responsible for the safe storage of his and his sub-contractors radio-active sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material will be taken by Contractor.
- i) The Contractor shall provide suitable safety equipment of prescribed standard to all employee and workmen according to the need or as may be directed by Employer who will also have right to examine these safety equipments to determine their suitability, reliability, acceptability and adaptability.
- j) Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code Practices/Rules framed under Indian Explosives Act pertaining to handling, storage and use of the explosives.
- k) The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The Scaffoldings shall be erected under the control and supervisions of an experienced and. competent person. For erection, good and standard quality of material only shall be used by the Contractor.

- l) The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other contractors under any circumstances, whatsoever, unless expressly permitted in writing by Employer to handle such fuses, wiring or electrical equipment.
- m) Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Employer or Contractor, he shall:
 - i) Satisfy the Employer that the appliance is in good working condition.
 - ii) Inform the Employer of the maximum current rating, voltage and phases of the appliances.
 - iii) Obtain permission of the Employer detailing the sockets to which the appliances may be connected.
- n) The Employer will not grant permission to connect until he is satisfied that:
 - i) The appliance is in good condition and is fitted with a suitable plug.
 - ii) The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.
- o) No electric cables in use by the Employer/Contractor will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.
- p) No repair work shall be carried out on any live equipment. The equipment must be declared safe by Employer and a permit to work shall be issued by Employer before any repair work is carried out by the Contractor. While working on electric lines/equipments whether live or dead, suitable type and sufficient quantity of tools will have to be provided by contractor to electricians/workmen/ officers.
- q) The contractor shall employ necessary number of qualified, full time Electricians/Electrical Supervisors to maintain his temporary electrical installations.
- r) In case any accident occurs during the construction/erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to Employer in prescribed form and also to all the authorities envisaged under the applicable laws.
- s) The Employer shall have the right at his sole discretion to stop the work, if

in his opinion the work is being done in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipments. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove short comings promptly. The Contractor after stopping the specific work, can, if felt necessary, appeal against the order of stoppage of work to the General Manager of Project within 3 days of such stoppage of work and decision of Project GM in this respect shall be conclusive and binding on the Contractor.

- t) The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.
- u) The Contractor shall follow and comply with all Employer Safety Rules relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or content or reservation. In case of any inconformity between statutory requirement and Employer Safety Rules, if any, referred above, the statutory requirement/provisions shall be binding on the Contractor.

2.2.0 Scaffolding and Ladders

Suitable scaffolding should be provided for workmen for all works that cannot be done from the ground, or from solid construction, except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials, suitable footholds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1.

2.3.0 Scaffolding and Staging Guards

Scaffolding or staging more than 3.5 m above the ground and floor swung or suspended from an overhead support or connected with stationary support shall have a guard-rail properly attached, bolted, braced and otherwise secured at least 90 cms. high above the floor or platform or such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging is so fastened as to prevent it swaying from the building or structure.

2.4.0 Platform, Gangways and Stairways

Working platform, gangways and stairways should be so constructed that they should not be unequally erected. If the height of the platform of the gangway or the stairway is more than 3.5 metre above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fenced.

2.5.0 Protection for Opening in Floor

Every opening in the floor of a building, bridge or in a working platform shall be provided with suitable means to prevent the fall of a person or materials by providing suitable fencing or railing whose minimum height shall be 90 cms. In case, it may be necessary to cover the opening temporarily.

2.6.0 Safe Access to Working Places

Safe and easy means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 metres in length, while the width between side rails in rung ladder shall, in no case, be less than 30 cms length. Uniform step spacing shall not exceed 30 cms.

Adequate precaution shall be taken to prevent danger from electrical equipment. No materials in any of the sites of work shall be so stacked or placed to cause danger or inconvenience to any worker or the public. The Contractor shall also provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence or every suit, action or other proceedings at law that may be brought by any person for injury sustained, owing to neglect of the above precautions and to pay the damage and costs which may be awarded in any such suit, action or proceedings to any such persons or which may, with the consent of the Contractor be have to be to paid to compromise any claim of any such person.

2.7.0 Drowning Rescue and First Aid

When the work is done near any place where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first-aid treatment of all injuries likely to be sustained during the course of work.

2.8.0 Hoisting Machines and Tackle Like Cranes Cableways etc.

Use of hoisting machines and tackle, including their attachments, anchorage and supports, shall conform to the following standards or conditions.

- i) a) These shall be of good mechanical construction, sound materials and adequate strength and free from latent defects and shall be kept in good repair and good in working order.
- b) Every rope used in hoisting or lowering material, as a means of suspension shall be of durable quality and of adequate strength and free from latent defects.
- ii) Every crane or cableway operator or hoisting appliance operators shall possess requisite qualifications, and no person under the age of 21 (twenty one) years shall be placed in charge of any hoisting machine, including any scaffold, which will give signal to the operator.
- iii) In case of hoisting machines and cabin ring hook shackle, swivel and pulley block used in hoisting or lowering as a means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine with the working load shall be used. In case of hoisting machines having a variable safe working load, each safe working load of the conditions under which it is applicable, shall be clearly indicated. No part of any machine referred to above in this paragraph shall be loaded beyond the safe working load, except for the purpose of testing.
- iv) In case of departmental machines, the safe working load shall be notified by the Employer. As regards Contractor's machines, the Contractor shall notify the safe working load of the machine to the Employer whenever he brings any machinery to the site of work, and shall get the same verified by the Employer before putting the machine to use.
- v) Every precaution shall be taken by the Contractor to ensure that the cableway skips are visible during night.
- vi) The cableway skips shall be firmly attached to the hooks.
- vii) The travelling and hoisting ropes of the cableway shall be of good quality and shall not break during operation of the cableway,
- viii) The limit switches showing the limits of travel of cableways shall function properly at all times and shall be easily visible from the operator's seat.
- ix) The rope guides shall be so spaced to prevent any accident due to slippage of carriage from the ropes.
- x) Suitable signal men and telephone operator shall be posted on duty whenever cable ways or other hoists are operated.
- xi) Cableways and ropes shall be inspected frequently to ensure safety of the people and materials or work sites and nearby.

2.9.0 Motors, Gearings, etc.

Motors, gearing, transmission, electric wiring are other dangerous parts of hoisting appliances shall be provided with efficient safeguards. Hoisting appliances shall be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating material, wearing apron such as gloves, sleeves, and boots, as may be necessary, shall be provided. The workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

2.10.0 Maintenance

All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffolds, ladder or equipments shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near places of work.

2.11.0 Display of Safety Provisions

All Safety provisions shall be brought to the notice of all concerned by display on a Notice Board at a prominent place at work spot. The persons responsible for receiving and processing complaints of safety code shall be named therein by the Contractor.

Section: A

CHAPTER -3

Quality Assurance & Inspection

3.0.0		Quality Assurance & Inspection
3.1.0		Quality Assurance Programme
	a)	<p>The Bidder shall follow Quality Assurance Programme to ensure that the equipment and services under the scope of contract whether manufactured or performed at the Bidder's works or at his sub-vendor's premises or at the SAPDC's site or at any other place of work are in accordance with the technical specifications. Such programme shall be outlined by the Bidder and be submitted along with the bid. The QA programme shall be generally in line with IS/ISO- 9001 and generally cover the following:</p>
		<ul style="list-style-type: none"> • Organization structure for the management and implementation of the proposed quality assurance programme • Quality System Manual • Design Control Systems • Documentation and Data Control Systems • Qualification/Experience of Bidder's key personnel. • Procedure for purchase of material, parts, components and selection of sub-vendor's services including vendor analysis, source inspection, incoming raw-material inspection, verification of materials purchased, etc. • System for shop manufacturing and site erection controls including process, fabrication and assembly. • Control of non-conforming items and system for corrective actions and resolution of deviations. • Control of calibration and testing of measuring / testing equipment. • System for Quality Audits. • System for identification and appraisal of inspection status. • System for authorising release of manufactured product to the Purchaser. • System for transportation /delivery, handling, storage and preservation. • System for maintenance of records.
3.2.0		General Requirements - Quality Assurance
	i)	<p>All materials, components and equipment covered under scope and its technical specifications shall be procured, manufactured, erected, commissioned and tested at all the stages, as per a comprehensive Quality Assurance Programmed agreed mutually</p>
	ii)	<p>Minimum Quality Assurance Test Requirement (QATR) to be followed during Manufacturing and Field erection indicating requirement of various tests / inspections, on major equipment / items, to be carried out</p>

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		as stipulated in technical specification and standards mentioned therein, are attached hereto and are part of bidding documents. Clarification, if any, on these quality assurance test requirements, raised by bidder shall be discussed and resolved during pre-bid meeting.
	iii)	After the award of contract, the contractor shall submit the detailed Manufacturing & Field Quality Assurance Plans for complete equipment / material during detailed engineering in the format attached hereto for approval and acceptance by SAPDC/Consultant in line with technical specification, Quality Assurance– General & Test Requirements and detailed engineering.
	iv)	Manufacturing Quality Assurance Plans shall detail out for all the components and equipment & various tests/inspection, to be carried out in conformity with relevant latest IEC/IS/ISO etc, quality practices and procedures to be followed by Contractor's / Sub-vendor's Quality Control Organization, the relevant reference documents, standards and acceptance norms etc. during all stages of material procurement, manufacture, assembly and final testing / factory acceptance tests.
	v)	The Field Quality Assurance Plans shall detail out the various tests/inspection to be carried out in conformity with relevant latest IEC/IS/ISO, quality practices and procedures etc. to be followed by the contractor's / sub-contractor's site Quality Control Organisation during various stages of site activities from receipt of material/equipment at workshop/site till final commissioning/ acceptance/handover.
	vi)	All major items/ equipment/ components to be manufactured in house as well as procured from sub-vendors (Bought out Items, BOI) to be listed in the bid. Bidder shall submit Quality Assurance Plan submission schedule in the bid for above listed items in attached Format in line with L2 Schedule.
	vii)	For components / equipment / Bought out Items procured by the contractor for the purpose of the contract, the Contractor's purchase specifications and inquiries shall call for quality plans to be submitted by the sub-vendors.
		The quality plans called for from the sub-vendors shall detail out, during the various stages of manufacture and installation, the quality practices and procedures followed by the sub-vendor's quality control organisation, the relevant reference documents/standards used,

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		acceptance level, inspection of documentation raised, etc. Such quality plans of the successful sub-vendors shall be finalized with the SAPDC/Consultant in line with requirement and such approved Quality Plans shall form a part of the purchase order/contract between the contractor and his sub-vendor.
		Within three weeks of the release of the purchase orders /contracts for such bought out items /components, a copy of the same without price details but together with the detailed purchase specifications and other related documents such as data sheet, drawings, quality plans and delivery conditions shall be furnished to the SAPDC/Consultant by contractor along with a report of the Purchase Orders placed, on the monthly basis, so far for the contract.
	viii)	The Quality Plans shall be submitted on electronic media e.g. CD or E-mail in addition to hard copy for review and approval of SAPDC/Consultant. After approval, the same shall be submitted in compiled form on CD-ROM by contractor.
	ix)	For all spares, replacement items and additional similar items, the quality requirements/Quality Plans as agreed for the main equipment supply shall be applicable.
	x)	All material of construction/fabrication/erection shall be as per technical specification / approved drawings.
	xi)	Contractor's Plant internal standards must be traceable to acceptable International / National standards & salient points of difference (if any) shall be clearly stated with submission of plant standards. The contractor shall furnish copies of reference documents, plant standards, acceptance norms, test and inspection procedure etc. as referred in Quality Plans along with Quality Plan to SAPDC/Consultant. These Quality Plans and reference documents/standards etc. will be subject to approval of SAPDC without which manufacturer shall not proceed. These documents shall form a part of the contract.
		Tests on components and sub-assemblies shall be carried out at various stages of manufacturing, till the product undergoes the final tests in conformity with the relevant standards.
	xii)	The Customer Hold Points (CHPs), identified in approved quality plan, i.e. testing checks which shall be carried out in the presence of the SAPDC,

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		beyond which the work will not proceed without written consent of SAPDC's authorized representative.
	xiii)	The contractor / sub-vendor shall carry out routine test on 100% items at his works. The quantum of check / test for routine and acceptance test by SAPDC/Consultant shall be generally as per criteria / sampling plan defined in referred standards. Wherever standards have not been mentioned, quantum of check / test for routine / acceptance test shall be as agreed during detailed engineering.
		The quantum of check when specified in percentage (%) / sampling basis shall be treated as per lot per sub-vendor. When the quantum of check is indicated to in whole no., then same quantum of check shall be applicable to each sub-vendor supplying the same equipment.
	xiv)	For sub-vendors identified during pre-award stage for submission of vendor details / credentials (category "DR"), contractor shall submit after placement of award in the manner within a month after placement of award or a period as agreed at the time of pre-award discussions.
		The proposed sub-vendors should be registered vendors of the bidder and must have proven experience for successful operation for similar equipment / items / processes as mentioned elsewhere in technical specification.
	xv)	Before assigning any portion of work to the sub-vendor, other than one specified and duly accepted in the contract, the contractor will take prior approval of SAPDC.
	xvi)	While sub-contracting any portion of work, it shall be mandatory to include these quality assurance – general & test requirements along with vendor qualification criteria, if indicated elsewhere in the technical specification, as a part of their bidding document.
	xvii)	Normally no request for change of sub-vendors or inclusion shall be entertained by SAPDC. But in exceptional circumstances, if the request for change of sub-vendors or inclusion is found reasonable and justified, then the same shall be entertained and the decision of SAPDC in this respect shall be final and binding. The time consumed for the change / inclusion of sub-vendors shall not be excluded from the stipulated time of the completion of the contract. This change shall not relieve the contractor from the responsibility to complete the work within stipulated time in any manner.

	xviii)	The contractor's proposal shall include sub-vendor's facilities established at the respective works, the process capability, process stabilization, Q.C. system followed, experience list etc. along with his own technical evaluation of sub-vendor. However, whenever felt necessary, sub-vendor assessment will also be carried out by SAPDC/Consultant in accordance with the above procedure and by factory visits; for existing/proposed vendors/sub-vendors. This approval shall not relieve the contractor from any obligation, duty or responsibility under the contract & SAPDC shall not be responsible for any complications arising between the contractor and his sub-contractor(s) / sub-vendor (s) and / or any other liabilities.
	xix)	SAPDC/Consultant reserves the right to carry out quality audit and quality surveillance of the system and procedures of the contractor / or their sub-vendor. The contractor shall provide all necessary assistance to enable SAPDC/Consultant to carry out such details & surveillance including Quality Manuals, if required by SAPDC/Consultant.
	xx)	All welding and brazing shall be carried out as per procedure drawn and qualified in accordance with requirement of ASME section-VIII/IX or other International equivalent standard acceptable to SAPDC/Consultant. All welding/brazing procedures shall be submitted to SAPDC/Consultant for review / verification prior to carrying out the welding/brazing. However, wherever required by the SAPDC/Consultant, tests shall be conducted in presence of SAPDC's authorized representative.
	xxi)	All Brazers, Welders and welding operators employed on any part of the contract either in Contractor/his sub-vendor's works or at site or elsewhere shall be qualified as per ASME section-VIII/IX or other equivalent International Standards acceptable to SAPDC/Consultant.
	xxii)	Unless otherwise proven and specifically agreed with SAPDC/Consultant, welding of dissimilar material and high alloy materials shall be carried out at shop only.
	xxiii)	All non-destructive examination shall be performed in accordance with written procedures as per International Standards. The NDT operator shall be qualified as per SNT-TC-IA (of the American or Indian Society of non-destructive examination). NDT shall be recorded in a report, which include detail of methods and equipment used, result/evaluation, job data and identification of personnel employed and details of co-relation of the test report with the job.

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	xxiv)	All material used for equipment manufacture including castings and forgings, etc. shall be of tested quality as per relevant codes/standards. Details of results of the tests conducted to determine the mechanical properties; chemical analysis and details of heat treatment procedure recommended and actually followed shall be recorded on certificates and time temperature chart. Tests shall be carried out as per applicable material standards and/or agreed details.
	xxv)	Contractor shall submit Field Welding Schedule for field welding activities like field welding location, numbers, welding procedure to be used, requirements, codes and NDT requirement along with all supporting documents, like welding procedures, heat treatment procedures, NDT procedures, etc. to SAPDC/Consultant for review at least thirty days before schedule start of erection work at site.
	xxvi)	Any other statutory requirements as applicable for the equipment / systems shall also be complied with.
	xxvii)	The inspection calls shall be placed at least 06 weeks in advance for overseas inspections excluding India and 15 days in advance for inspections within India and Nepal.
	xxviii)	Before submitting the inspection call to SAPDC for witnessing the Customer Hold Points (CHP's) and/or requesting SAPDC for issuance of Material Dispatch Clearance Certificate (MDCC) based on Test Certificate (TC) review / Certificate of Conformance (COC), the contractor shall ensure that all Drawings / documents / GTP / technical data sheet, relevant to respective CHP / MDCC requirement, has been duly approved / accepted / noted by SAPDC.
	xxix)	Contractor shall ensure readiness of offered equipment by all means, before raising such call to SAPDC to attend CHP inspections. In case, SAPDC engineer (s) on reaching at a place of inspection found that material is not ready for inspection due to whatsoever reason, the complete inspection expenditure of SAPDC engineer(s) as per actual shall be chargeable to the contractor.
	xxx)	Only calibrated testing & measuring instruments shall be used while performing tests during manufacturing and erection, testing & commissioning at site by the contractor. Copy of the calibration

		certificates will be submitted to SAPDC/Consultant by the contractor during inspection as an evidence.
	xxxi)	Non-conformities observed during manufacturing, shop testing, handling, packaging, transportation, storage, preservation, erection, testing & commissioning are required to be intimated by the contractor). The acceptance/rejection of the non-conformities will be at the discretion of SAPDC.
		Repair/rectification procedures to be adopted to make the job acceptable shall be subject to the acceptance of SAPDC. Action taken in accordance with decision of disposal of non-conformity for repair / rework / modification of the item / equipment and to prevent re-occurrence. The corrective and preventive action may involve modification of item / equipment, change in procedure and system etc. to achieve quality improvement at all stages and levels.
	xxxii)	Quality audit/surveillance/approval of the results of the tests and inspection will not, however, prejudice the right of the SAPDC to reject the equipment if it does not comply with the specification when erected or does not give complete satisfaction in service and the above shall in no way limit the liabilities and responsibilities of the Contractor in ensuring complete conformance of the materials/equipment supplied to relevant specification, standard, data sheets, drawings etc.
	xxxiii)	No material shall be dispatched from the manufacturer's works before the same is duly accepted, subsequent to pre dispatch/final inspection including verification of records of all previous tests/inspection by SAPDC and duly authorised for Dispatch by issuance of Material Dispatch Clearance Certificate (MDCC).
	xxxiv)	The test reports of type tests conducted as per contract, in line with requirement stipulated in the technical specification / quality plan should be got accepted from SAPDC/Consultant before final inspection / issuance of MDCC.
	xxxv)	All materials used or supplied shall be accompanied by valid and approved material certificates and tests and inspection reports. These certificates and reports shall indicate the heat numbers or other such acceptable identification numbers of the material. The material certified shall also have the identification details stamped on it to ensure physical correlation and traceability of material vis-a-vis test certificate. Such identification no.

		shall remain same and verifiable for all stages of manufacturing and installation/erection.
3.3.0		QA Documentation
	i)	The contractor shall be required to submit the QA Documentation in two hard copies and two CD ROMs, as identified in respective quality plan.
	ii)	Each QA Documentation shall have a project specific Cover Sheet bearing name and identification number of equipment including index of its contents with page control on each document. The QA Documentation file shall be progressively completed by the Contractor/sub-vendor to allow regular reviews by all parties during the manufacturing. The final quality document will be compiled and issued at the final assembly place of equipment before dispatch. However CD-ROM may be issued not later than three weeks.
	iii)	Before dispatch / commissioning of any equipment, the Contractor shall make sure that the corresponding quality document or in the case of protracted phased deliveries, the applicable section of the quality document file is completed. The Contractor will then notify the Inspector regarding the readiness of the quality document (or applicable section) for review.
	iv)	The contractor shall be required to submit copies of the following quality assurance documents in original duly reviewed and accepted by contractor along with the request letter for issuance of MDCC (Material Dispatch Clearance Certificate):
		<ul style="list-style-type: none"> • Quality Plan check list. • Material mill test reports on components as specified in Quality Plan. • Sketches and drawings used for indicating the method of traceability of the radiographs to the location on the equipment. • Non-destructive examination results reports including interpretation reports. • Calibration certificate of all meters & measuring instruments proposed to be supplied as part of relevant Billing Breakup item. • Routine test reports for testing required as per applicable codes and standards referred in the Specifications. • Inspection reports duly signed by authorized representative of SAPDC and contractor for the agreed Customer Hold Points. • All the accepted deviations shall be included with complete technical details. • List of balance points if any.

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		<ul style="list-style-type: none">• Certificates in respect of Calibration, Welders & Brazers Qualification etc.• Copy of all reference drawings and reference technical documents• Acceptance of Type Test Reports by SAPDC.• Any other relevant document desired by SAPDC/consultant as per approved QAP, Technical Specification and approved drawings.
	v)	Similarly, the Contractor shall be required to submit two sets (two hard copies and two CD ROMs), containing QA Documentation pertaining to field activities as per Approved Field Quality Plans and other agreed manuals/procedures, within 2 weeks after commissioning of individual system.
	vi)	On release of QA Documentation by Inspector, one set of quality document shall be forwarded to Corporate Quality Assurance Department and other set to Project Site. For the particular case of phased deliveries, the complete quality document to the SAPDC shall be issued not later than 3 weeks after the date of the last delivery of equipment ie erection & testing of Pressure Shaft Steel Liner.

Section: A

CHAPTER -4

Testing, Commissioning And operational acceptance

4.1.0

Final Checking and Testing

After completion of various phases of works final checking of the entire work shall be done by the contractor to ensure that all the Works/Plant erection etc. have been done strictly according to the specification drawings and approved by the Employer. All the works shall be thoroughly inspected as per approved QAP & Technical specification and drawings keeping in view the following various points:

- i) Checking for completion of all works in accordance with specifications and drawings.
- ii) Checking of alignments of all Segments.
- iii) Checks for correctness of connections, continuity check as per approved QAP
- iv) Checks, adjustment and characteristics tests of all control/ protective equipment in accordance with manufacturer's instructions
- v) Setting and calibration of components etc.
- vi) Checking of Works/Plant for proper mechanical adjustment and proper adjustment and proper operation
- vii) All routine and pre-commissioning tests and any other special tests required to be conducted at site on each and every Works/Plant as per the relevant standards and manufacturer's instructions/recommendations.
- viii) All other tests as specified under relevant standards and codes of practice but not mentioned here.
- ix) Tests and commissioning of all ferrule including Bifurcation.

Proper record shall be maintained for all visual inspection & NDT, settings and checks carried out and be submitted by the contractor to the Employer.

4.2.0

Operational Acceptance

The operational acceptance of the Works/Plant shall be based on the following:

- i) Quality and Workmanship of the Works/Plant.
- ii) Satisfactory operation of the Works/plant after erection as required under these specifications and QAP.
- iii) Acceptance of various tests by the Employer as mentioned above

- iv) All tests may be witnessed by the contractor/ Employer or his authorized representative(s). On successful completion of all tests, the Works/Plant shall be accepted but all the responsibility shall remain with the supplier within the guarantee period.
- v) The taking-over of any part or section of the Permanent Works, which can operate as an independent unit, shall be performed in accordance with the standards and regulations laid down in the Specifications and the test procedure.
- vi) Immediately upon termination of any such testing of a part or section of the Permanent Works a "Protocol of Acceptance", which shall be deemed to be the Test certificate, shall be issued by the Employer.
- vii) This document shall be signed by an authorized representative of the Employer and the Contractor and shall form an integral part of the later "Taking-Over Certificate".

The acceptance of the equipment/steel liner will be based upon:

- Mutual acceptance of results of test between the contractor and the Employer.
- Acceptance of Inspection and test records/Test Certificates carried out at "Site".

This "Protocol of Acceptance" shall state:

- The date of testing.
- The Confirmation that the guaranteed data have been proven.
- Confirmation that all contractual documents have been submitted.
- Confirmation that the Employer's personnel have been familiarized with the works and that they will be able to operate and maintain the works properly.

If any test for the verification of the guaranteed data could not be performed for operational reasons beyond the Contractor's responsibility, this part of the acceptance shall be stated in the "protocol of Acceptance" and be postponed for a mutually agreed period.

4.3.0

Defective Works/Plant

In case any part of the Works/Plant is found to be defective in materials or workmanship or develops defects or does not otherwise meet the requirements of the specifications including errors or omissions on the part of the contractor, the following shall apply.

a) Defects disclosed prior to Final Acceptance

Any defects in materials or workmanship or other failure to meet the requirements of these specifications including errors or omissions on the part of contractor, which are disclosed prior to final payment or prior to final acceptance tests, whichever occurs at a later date, shall, if so directed by the Employer, be corrected entirely at the expense of the contractor.

b) Defects disclosed after Final Acceptance

Any latent defect not disclosed before the date of final acceptance shall be corrected promptly by the contractor entirely at his expense provided that the total period during which the contractor is liable for replacement due to latent defects shall not exceed twenty four months after the date of final acceptance of the Works/Plant.

4.4.0

Operation of Unsatisfactory Works/Plant

The Employer shall have the right to operate all permanent Works/Plant as soon as and as long as it is in operating conditions, whether or not such Works/Plant is being accepted. Such operation by the employer shall not lessen or impair any expressed or implied warranties concerning such Works/Plant. All repairs or alterations required shall be met at such times as directed by the Employer and in such a manner as will cause the minimum interruptions in the use of the Works/Plant by the Employer. Operation of the Works/Plant in pursuant to this section shall not relieve the contractor of his responsibilities to supply all Works/Plant in complete accordance with these Technical Specifications. While unsatisfactory articles can be taken out of service for correction of latent defects, errors or omissions, the period of such operation for any use, correction of latent defects, errors or omissions, shall not exceed two years without mutual consent of the contractor and the Employer.

**QUALITY ASSURANCE TEST
REQUIREMENTS
AND
FORMS**

MANUFACTURING QUALITY ASSURANCE TEST REQUIREMENT

PROJECT NAME: ARUN III HEP (4x225 MW)	DOC. No.: QAI/A3/M/HM/PS/01	REV. No. 00
ITEM DESCRIPTION:- PRESSURE SHAFT	ISSUE DATE: 30/01/2023	PAGES : 03

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
1	Incoming Material		
1.1	Rail Track		
	Chemical Properties	TS/ Rel Std	V
	Size	TS/ Rel Std	V
	Dimensional Check	TS/ Rel Std	V
1.2	Steel Plates for Steel Liner		
	Chemical Properties	TS/ ASTM-A 537/517	V
	Mechanical Properties	TS/ ASTM-A-370	V
	Dimensional Check & thickness measurement	TS/ DRG	V
	Ultrasonic Testing	TS/ DRG	V
	Heat Treatment	TS/ DRG	V
	Material identification/ Material transfer stamping	TS/ DRG	V
1.3	M.S. Bolts, Studs, Nuts and Washer		
	Chemical & Mechanical Properties	IS 1364	V
	Material Dimension	IS 1364	V
1.4	Stainless Steel for Piezometer Plugs		
	Chemical Properties	TS/ IS 1570/ BS 970-EN-56-A	V
	Mechanical Properties	TS/ IS 1570/ BS 970-EN-56-A	V
1.5	Gasket or joining material		
	Chemical Properties	TS/BS1737	V
	Physical Properties	TS/BS1737	V
	Surface Finish	TS/BS1737	V
	Tensile Test	TS/BS1737	V
	Dimensional Check	TS/BS1737	V
1.6	Discharge Measuring Instrument		
	Make, Type & Model	TS/ Rel Std	V
	Calibration Certificate	TS/ Rel Std	V
	Functional & Operational Check	TS/ Rel Std	V
1.7	Recorders		

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
	Make, Type & Model	TS/ Rel Std	V
	Functional & Operational Check	TS/ Rel Std	V
2	General Requirements		
	Material Identification and marking	TS/ Rel Std	V
	Visual examination of raw material	TS/ Rel Std	V
3	Fabrication		
3.1	Marking, Cutting and Edge		
	Marking of the plates	TS/ DRG/ Rel Std.	V/W
	Cutting of plates	TS/ DRG/ Rel Std.	V/W
	Edge preparation of plates	TS/ DRG/ Rel Std.	V/W
	Squareness of plates	TS/ DRG/ Rel Std.	V/W
	Shearing of plates	TS/ DRG/ Rel Std.	V/W
3.2	Bending of Plates		
	Check for length of plate to be equal to calculated circumferential length	TS/ DRG/ Rel Std.	V/W
	Check for curvature with templates	TS/ DRG/ Rel Std.	V/W
3.3	Welding Plate of Unequal Thickness		
	Check for proper jointing of plates	TS/ DRG/ Rev Std./ IS 2825	V/W
3.4	Stiffener Rings, Thrust Collars, Anti Percolation Rings		
	Check for staggering of weld joints of stiffeners/ thrust collar/ anti percolation rings & Longitudinal welds of the liner	TS/ DRG/ Rel Std.	V/W
	Check for the position of the holes for concrete pouring	TS/ DRG/ Rel Std.	V/W
	Check for fitment of plates	TS/ DRG/ Rel Std.	V/W
3.5	Backing strip		
	Check for thickness, matching fitment & welding	TS/ DRG/ Rel Std.	V/W
3.6	Manholes and nozzle etc		
	Check for installation on steel liner	TS/ DRG/ Rel Std.	V/W
3.7	Bends and Reducers		
	Check for the deflection angle of each segment	TS/ DRG/ Rel Std.	V/W
	Check for marking, cutting, welding & fabrication	TS/ DRG/ Rel Std.	V/W
	Check for the staggering of longitudinal welds consecutive bends courses	TS/ DRG/ Rel Std.	V/W
3.8	Bulk heads	TS/ DRG/ Rel Std.	
3.9	Alignment & Tolerances		
	For circumferential & longitudinal joints	TS/ DRG/ Rel Std.	V/W

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
	For shells	TS/ DRG/ Rel Std.	V/W
	Cutting of plates	TS/ DRG/ Rel Std.	V/W
	For chamfered edges	TS/ DRG/ Rel Std.	V/W
	Check for straightness	TS/ DRG/ Rel Std.	V/W
	Check for irregularity & ovality of profile	TS/ DRG/ Rel Std.	V/W
	Difference between maximum & minimum diameters at any cross section	TS/ DRG/ Rel Std.	V/W
	Check for pre weldment fitment	TS/ DRG/ Rel Std.	V/W
	Check for offset between abutting external surface	TS/ DRG/ Rel Std.	V/W
	Check for fit-up of stiffner rings	TS/ DRG/ Rel Std.	V/W
	Weld Joint Design, Root Gap & Mismatch	TS/ DRG/ Rel Std.	V/W
3.10	Longitudinal & Circumferential Joint Fit-up		
	Weld joint design, root gap & mismatch	TS/ DRG/ Rel Std.	V/W
	Check for the staggering of longitudinal welds & grout hole positions	TS/ DRG/ Rel Std.	V/W
	Temperature	TS/ DRG/ Rel Std.	V/W
4	Grouting and Drainage Holes		
4.1	Check for location of Holes	TS/ DRG/ Rel Std.	V/W
5	Welding		
	WPS, PQR and WPQR	TS/ DRG/ Rel Std.	W / V
5.1	Butt Weld, Longitudnal and circumfrential Welds		
	DP/MPI test after root run	TS/ DRG/ Rel Std.	V
	RT shall be conducted as per approved drawing/TS/Standard	TS/ DRG/ Rel Std.	V/W
	UT, DPT, MPI shall be conducted as per approved drawing/TS/Standard	TS/ DRG/ Rel Std.	W
5.2	Fillet weld		
	NDT of all fillet weld joint as per drawing or MPI / DP of all fillet joints if it is not specified in drawing.	TS/ DRG/ Rel Std.	W
5.3	All welds		
	Visual Examination for final weld appearance, cracks, undercut, Excess reinforcement, burn through or excess penetration, root concavity , non-uniform width of fillet weld joint, distortion & misalignment.	TS/ DRG/ Rel Std.	W
	Complete assembly/sub-assembly (as per drawing) to be stressed relieved after welding.	TS/ DRG/ Rel Std.	V

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
	Dimensional check of weld joints/ Weld size (Weld size shall be checked with universal weld gauge)	TS/ DRG/ Rel Std.	W
	Ensure that the welding consumables used as per procedure (WPS)	TS/ DRG/ Rel Std.	V
	Ensure proper edge preparation wherever applicable	TS/ DRG/ Rel Std.	V
	Ensure proper sequence of welding	TS/ DRG/ Rel Std.	V
	Check & ensure that the overlap/ excess weld metal is removed by grinding and painting	TS/ DRG/ Rel Std.	V
	Check the measurement of the parts structures after welding for the corrections of dimension & matching absence of distortion and alignment	TS/ DRG/ Rel Std.	W
	Welding of Temporary attachments	TS/ DRG/ Rel Std.	W / V
5.4	Check that all the recommendation of the steel suppliers has been incorporated in the relevant WPS and erection procedure	TS/ DRG/ Rel Std.	W / V
5.5	Weld/welder records		V
	Welding & welder records to be maintained as per weld Log book	TS/ DRG/ Rel Std.	V
5.6	Production welding test		
	On Longitudinal & circumferencial welds & butt weld	TS/ DRG/ Rel Std.	W
5.7	Repair of welds	TS/ DRG/ Rel Std.	
	Check the procedure of rectification	TS/ DRG/ Rel Std.	V
	Recommendation from steel suppliers	TS/ DRG/ Rel Std.	V
6	Machining (if applicable)		
	Visual Examination & Dimensional Check	TS/ DRG/ Rel Std.	V
	Surface Finish	TS/ DRG/ Rel Std.	V
	Material Traceability Control and transfer stamping	TS/ DRG/ Rel Std.	V
7	Hydro Static Testing as per approved DRG/ TS/ Rel Std	TS/ DRG/ Rel Std.	W
8	Trolley trial operation test	TS/ DRG/ Rel Std.	V
9	Painting		
	Paint Material	TS/ DRG/ Rel Std.	V
	Surface preparation	TS/ DRG/ Rel Std.	V
	Check for temperature of steel liner	TS/ DRG/ Rel Std.	V
	Check for segregation	TS/ DRG/ Rel Std.	V
	Check for dryness of film of previous coat	TS/ DRG/ Rel Std.	V
	Check for coverage area	TS/ DRG/ Rel Std.	W

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
	Dry film thickness	TS/ DRG/ Rel Std.	W
LEGENDS			
W: CUSTOMER HOLD POINT (CHP)		DRG: DRAWING	
TS: TECHNICAL SPECIFICATION		REL. STD: RELEVANT STANDARD	
V: VERIFICATION OF REPORT / TCs			
NOTES:			
1	Any test at any stage not covered in Quality Assurance Test Requirement (QATR), but part of technical specification of contract, shall also be carried out by Contractor / firm.		
2	QATR shall be read in conjunction with General Quality Assurance Requirement given as part of Technical Specification.		
3	Please refer following QATR for associated equipment of Pressure Shaft (to be read in conjunction with this QATR for the complete requirement as per TS)		
Sr.No			
QATR Description			
Doc. No.			
Rev. No.			
3.1	Weld Log Sheet	QAI/A3/WL/01	0

WELD LOG SHEET

Customer		Project Name:										Page No.						
Component Name		Drawing No.										Doc. No. QAI/A3/WL/01						
Sub-component name		Drawing No.										Vendor/Sub-vendor:						
Engineering		Production						Quality Control						Result				
		Weld No.	WPS No.	Weld Length	Pre-heat temp.	Electrode temp	Completion date	Weilder identification	Foreman/supervisor Insp.	VI Report	MI report	DP report	UT report	RT report	Reject date	Approve Date	Type of repair	
Drawing No./Section No.																		
LEGENDS:		VI: Visual Inspection			MI: Magnetic Particle Inspection			DP: Dye Penetrant Inspection			UT: Ultrasonic Testing			RT: Radiographic Testing			Vendor/Sub-vendor (Name & Signature of Engineer)	

FIELD QUALITY ASSURANCE TEST REQUIREMENT

PROJECT NAME: ARUN III HEP (4x225 MW)

DOC. No.:
QAI/A3/F/HM/PS/01

REV. No.
00

ITEM DESCRIPTION:- PRESSURE SHAFT

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SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
1.1	Receipt of Material		
	External conditions of Equipment free from Damages etc	TS/ Rel Std	W/V
	Number of packages in each Equipment and physical condition of each package	TS/ Rel Std	W/V
1.2	Storage of Material		
	Proper Placement of equipment as per the Instruction Manual.	TS/ Rel Std	W/V
	Ensure that no damage or rusting takes place during storage	TS/ Rel Std	W/V
	Ensure that all delicate Equipment are stored in protected area.	TS/ Rel Std	W/V
2	Grouting and Drainage Holes		
2.1	Check for location of Holes	TS/ DRG/ Rel Std.	W / V
2.2	Check for sealing of Holes by plugs after completion of grouting	TS/ DRG/ Rel Std.	W / V
3	Welding		
	WPS, PQR and WPQR	TS/ DRG/ Rel Std.	W / V
3.1	Butt Weld, Longitudnal and circumferential Welds		
	DP/MPI test after root run	TS/ DRG/ Rel Std.	W
	RT shall be conducted as per approved drawing/TS/Standard	TS/ DRG/ Rel Std.	W / V
	UT, DPT, MPI shall be conducted as per approved drawing/TS/Standard	TS/ DRG/ Rel Std.	W
3.2	Fillet weld		
	NDT of all fillet weld joint as per drawing or MPI / DP of all fillet joints if it is not specified in drawing.	TS/ DRG/ Rel Std.	W / V
3.3	All welds		
	Visual Examination for final weld appearance, cracks, undercut, Excess reinforcement, burn through or excess penetration, root concavity , non-uniform	TS/ DRG/ Rel Std.	W / V

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
	width of fillet weld joint, distortion & misalignment.		
	Complete assembly/sub-assembly (as per drawing) to be stressed relieved after welding and before load testing.	TS/ DRG/ Rel Std.	W / V
	Dimensional check of weld joints/ Weld size (Weld size shall be checked with universal weld gauge)	TS/ DRG/ Rel Std.	W / V
	Ensure that the welding consumables used as per procedure (WPS)	TS/ DRG/ Rel Std.	W / V
	Ensure proper edge preparation wherever applicable	TS/ DRG/ Rel Std.	W / V
	Ensure proper sequence of welding	TS/ DRG/ Rel Std.	W / V
	Check & ensure that the overlap/ excess weld metal is removed by grinding and painting	TS/ DRG/ Rel Std.	W / V
	Check the measurement of the parts structures after welding for the corrections of dimension & matching absence of distortion and alignment	TS/ DRG/ Rel Std.	W / V
	Welding of Temporary attachments	TS/ DRG/ Rel Std.	W / V
3.4	Check that all the recommendation of the steel suppliers has been incorporated in the relevant WPS and erection procedure	TS/ DRG/ Rel Std.	W / V
3.5	Weld/welder records		W / V
	Welding & welder records to be maintained as per weld Log book	TS/ DRG/ Rel Std.	W / V
3.6	Production welding test		
	On Longitudinal & circumferencial welds & butt weld	TS/ DRG/ Rel Std.	W
3.7	Repair of welds	TS/ DRG/ Rel Std.	
	Check the procedure of rectification	TS/ DRG/ Rel Std.	W
	Recommendation from steel suppliers	TS/ DRG/ Rel Std.	W
4	Erection of Steel liners		
	Check for match marking and weight	TS/ DRG/ Rel Std.	W
	Install a rail track to move and to position the pipe sections and leave the rails embedded in secondary concrete, provided the rails are supported on steel pieces.	TS/ DRG/ Rel Std.	W
	Centre distance measure at every 6 Mtr. Length	TS/ DRG/ Rel Std.	W

SR. NO.	COMPONENT , OPERATION & CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	8	11
	Rail centre distance at every 6 mtr. length. Diagonal, straightness of each rail.	TS/ DRG/ Rel Std.	W
	Verification of expansion gap within rail w.r.t. civil drawing.	TS/ DRG/ Rel Std.	W
	Tightening of rail clamps (LT Rail)	TS/ DRG/ Rel Std.	W
	Waviness of rail (horizontal and vertical planes)	TS/ DRG/ Rel Std.	W
	Trolley trial operation test	TS/ DRG/ Rel Std.	W
	Finger bars and other temporary supports shall be installed in such a way that no deformations are induced on the pipe.	TS/ DRG/ Rel Std.	W
	The steel liner shall be installed in correct grade and alignment.	TS/ DRG/ Rel Std.	W
	Sufficient finger bars shall be used on circumferential joints to maintain the alignment during the welding operation.	TS/ DRG/ Rel Std.	W
5	Non Destructive Tests at field erection		
	Visual & DP/MPI Test of root run	TS/ DRG/ Rel Std.	W
	Butt joint: DP, MPI, UT, RT as per approved TS/ DRG/ Standard	TS/ DRG/ Rel Std.	W
	Fillet weld: Visual & DP/MPI Test.	TS/ DRG/ Rel Std.	W
6	Check for alignment	TS/ DRG/ Rel Std.	W
7	Trolley trial operation test FOR o&m	TS/ DRG/ Rel Std.	W
8	Tolerance	TS/ DRG/ Rel Std.	W
9	Cleaning & painting in the field	TS/ DRG/ Rel Std.	W
LEGENDS			
W: CUSTOMER HOLD POINT (CHP)		DRG: DRAWING	
TS: TECHNICAL SPECIFICATION		REL. STD: RELEVANT STANDARD	
V: VERIFICATION OF REPORT / TCs			
NOTES:			
1	Any test at any stage not covered in Quality Assurance Test Requirement (QATR), but part of technical specification of contract, shall also be carried out by Contractor / firm.		
2	QATR shall be read in conjunction with General Quality Assurance Requirement given as part of Technical Specification.		
3	Please refer following QATR for associated equipment of Pressure Shaft (to be read in conjunction with this QATR for the complete requirement as per TS)		
Sr.No.	QATR Description	Doc. No.	Rev. No.
3.1	Weld Log Sheet	QAI/A3/WL/01	0

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VENDOR / SUB-VENDOR ASSESSMENT SHEET

TO BE FILLED-IN BY SUPPLIER / SUB-VENDOR

NAME OF SUPPLIER / SUB-VENDOR IN FULL					
	REGISTERED OFFICE	FACTORY / WORKS			
ADDRESS					
TELEPHONE NO.					
FAX NO.					
EMAIL ID					
PERSON(S) TO BE CONTACTED (NAME & DESIGNATION & MOBILE NO.)					
WEEKLY OFF					
SHIFT WORKING					
SHIFT WORKING		Type of Company (Pl. Tick)		Type of Industry (Pl. Tick)	
OFFICE	WORKS	Pvt. Ltd	Public Ltd.	MSME	Large Scale
ONE	ONE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Proprietary	Partnership	Govt.	Contractor
TWO	TWO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Public Sector			
THREE	THREE	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>				
Sr. No.	Items / Services / Process for which Approval is desired for		Rating / Size & Type		Applicable Standards IS/DIN/BS/IEC Etc.

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REGISTRATION DETAILS #

PAN / TAN NO.	CENTRAL SALES TAX REG. NO.	STATE SALES TAX / TIN NO.	EXCISE DUTY REGISTRATION NO.
EXCISE CONTROL CODE NO.	SERVICE TAX REG. NO.	CATEGORY OF INDUSTRY	REGISTRATION NO. & VALIDITY DATE
		Micro <input type="checkbox"/> Small <input type="checkbox"/> Medium <input type="checkbox"/> Large <input type="checkbox"/>	

A. ORGANISATIONAL SOUNDNESS

SR. NO.	DESCRIPTION	DETAILS TO BE FURNISHED
1.	Nature of Business (Strike whichever is not applicable)	Manufacturing Unit / Engineering Consultant / Agents / Distributors / Stockists / Dealers / Traders / Indian Subsidiary / EPC contractor / Channel Partner (Attach authorization certificate of principal) / Erection contractor / Other
2.#	Year of commencement of Business / Factory Establishment	
3.	Year of Commencement of Manufacture / Services	

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4.	Total Area/Covered Area in Sq. m.	Total Area	Covered Area
5.	Electric Power-Connected Load		
6.#	Electric Power Standby Load & System		
7.	Details of Directors		

Sr. No.	Name	Designation	Qualification	Experience

8.	Details of Employees		
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Plases attach copy of Company's Organization Chart (For Unit)

Division Status	Graduate		Diploma	Skilled	Un-Skilled	Remarks
	Technical	Non-Technical				
Production						
Engineering & Quality Control						
Administration & Other Supporting activities.						

9.	Brief Details of Product and Manufacturing Capability				
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Sr. No.	Item & Material	Description (Type, Size Rating)	Annual Production for Last Three Years		
			I	II	III

10.#	Details of Foreign or Indigenous Collaborator			
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Sr. No.	Product	Name & Address of Collaborator	Collaboration		
			Scope	Year	Valid up to

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11# Have your product been type tested by any external agency? If so, give details

Sr. No.	Product	Test (Size / Type & class	Test Report No.	Next Due date

12.# Have you been approved by any Statutory agency / third party agency like LLOYD, ASME, NTPC, PGCIL, EIL, Railways etc. ? If so, indicate details and enclose copies of approval letters

Sr. No.	Item / Material / Service / Process	Description (Size, Type & Class)	Agency	Date of approval	Next Due date

13.# Indicate Approval / Certification by National / International Standards / Agencies applicable for the subject product.

Sr. No.	Product	Codes / Standards	License No. & Date

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14.#	Reference List (Experience in Particular Type of Equipment / Service / Process). Please indicate since how many years similar type of item / equipment / service / process provided (please furnish documentary evidence).				
Sr. No.	Item / Material / Service / Process	Type & Capacity / Rating	Customer (End User with Address)	Date of Supply / Service provided	Under Operation since year / Month

#Note: Please furnish the performance feedback certificate for proposed item / equipment / process / service form end user in line with requirement stipulated in Technical Specification.

15.#	Business Commenced with SAPDC/SJVN in past				
Sr. No.	Year	Name of Department / Project Dealt with	Item Supplied / Services Offered.		

16.A#	Machinery, Instrument & other Equipment Specific to Process & Product Facilities / service				
Sr. No.	Description of Machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.

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16.B#	Other General Facilities				
Sr. No.	Description of Machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.
i	Material Handling Mobile Crane Fork Lift Over Head Cranes				
ii	Metal Cutting & Bending				
iii	Casting				
iv	Forging				
v	Fabrication				
vi	Welding				
vii	Machining				
viii	Heat Treatment				
ix	Sheet Metal				
x	Fettling & Cleaning, Sand Blasting, Shot Blasting & Pickling				
xi	Painting				
xii	Metal Coating				
xiii	Protection before packing				
xiv	Packing				
xv	Other				
17.#	If In-House Manufacturing Facilities not available, inform source of manufacturing details along with their facilities and experience				
Sr. No.	Process outsourced	Name of the company	Description of machine / Equipment	Remarks	
18. A#	Facilities for In-house Testing & Inspection				
Sr. No.	Description	Capacity & Nos.	Make & Year of	Calibration Status	Approval Qualificati

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			Mfg.		on

18.B# If In-house testing facilities are not available, indicate source of testing with relevant details.

Sr. No.	Source of Testing	Description	Capacity & Nos.	Make & Year of Mfg.	Calibration Status	Approval Qualification

Note: In case of outsourcing of major testing such as NDT, Electrical & Mechanical testing, no marks will be awarded. However, material composition testing by chemical method from NABL Lab shall not attract negative marking.

18 C #	Details of any Government Laboratory facility available in area	
	Product related testing facility (type / Performance / Routine / Acceptance Test)	

19 Sources of Raw Material and Bought out Items

Sr. No.	Description of Raw Material / Bought Out Items	Source

20 #	Storage Area Availability	
	Storage for finished goods (Open / Close)	
	Raw Material storage and identification	

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21 #	Do you have in-house Design / R&D departments?	
22 #	Details of pending legal issues on contractual aspects with customers, if any.	
23 #	Please furnish details of Labour problems in the last three years, if any?	

B.	FINANCIAL SOUNDNESS OF ORGANIZATION			
	Financial Information for last Three Years (Please furnish copy of annual report)			
Sr. No.	Parameters	Year 20	Year 20	Year 20
1#	Please furnish annual turnover of the company.			
	Growth in annual turnover w.r.t. previous years (%)			
2#	Please furnish Profit before tax (PBT) of the company.			
	Growth in PBT w.r.t. previous years (%)			
3#	Please indicate the net worth (Net current assets – Net current liabilities) of the company?			
4#	Whether the vendor has been referred to BIFR / NCLT / any other similar Govt. agency.			
5#	Whether the supplier is a potentially sick company.			
6	Please mention current order book position, as on date in terms of Value and time			

C.	QUALITY SYSTEM		
SR. NO.	DESCRIPTION	Sub-vendor response (along with supporting document)	
1#	Are you an ISO 9001 company? If yes, please furnish the certificate and what is your quality policy?		
2#	Is the company an ISO 14000 approved?		
3#	Is the company an OHSAS approved?		
4#	Have your company won any Quality award like Rajeev Gandhi National Quality Award, IMC Ramkrishna Bajaj National Quality Award, Golden Peacock National Quality Award etc? If yes provide documentary evidence.		
5#	Have you received appreciation letter from your customer. Please provide evidence.		
6	To whom your Q.C./Q.A. Chief reports to ? (Please furnish your organization structure)		
7#	If you have a written quality control manual/procedure, then please furnish the same.		
7 (i) #	Incoming Material Control System (Furnish a copy of system and organization)		
7 (ii) #	Process Control: Are written procedure defining stage wise operations and functions on shop floor established and followed? (Furnish copy of work instruction and record of process control parameter)		
7 (iii) #	Manufacturing/Testing Procedure Qualification & Personnel		

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	Qualification (Procedure qualification specification & Record of personnel qualification (PQR) to be submitted).	
7 (IV) #	Are written Quality Control Instruction sheets prepared & properly used? (Please furnish evidence)	
7 (V)#	Are records generated during inspection maintained & available for review? (Please furnish evidence)	
7 (VI) #	Are quality control checks / procedure adequate to maintain desired quality level right from the incoming stage to final stage? Please furnish copy of such control checks / procedure.	
8.#	Documentation Control	
8 (i)	Does a system for clear and precise stipulation of responsibilities for documentation issue & change control exists?	
8 (ii)	Are changes made in writing?	
9#	Control of Inspection, measuring and testing equipment	
9 (i)	Are necessary gauges, testing and measuring equipment's, available and used?	
9 (ii)	Are testing and measuring equipment properly maintained?	
9 (iii)	Is recorded control on calibration of equipment available?	
10#	System of Identification & Traceability of materials, tools, jigs, fixtures & processed components, etc. (Copy of procedure to be submitted).	
11#	System of Storage / Preservation / Painting and Packing (copy of Procedure to be submitted)	
12#	Do you have written procedure for disposing off the non-conformities? If yes, please furnish the copy of the same also furnish three copies of NCR & CAPA.	
13#	Safety measures (Submit copy of safety system & record of accidents for last two years)	
14#	What type of Sampling Inspection Plan is used in your factory/company? Please furnish details.	
15	How good are you in keeping your dispatch commitments? Please give details of last ten deliveries stating details as below (Provide documentary evidence) Within delivery period: Delayed but accepted by user: Delayed but accepted with penalty:	
16#	Have you ever been de-listed or put in under temporary suspension by any customer / contractor.	

D.	AFTER SALES SERVICE	
SR. NO.	DESCRIPTION	Sub-vendor response (along with supporting document)
1#	For overcoming product deficiencies what are the analytical methods used at Customer's premises?	
2#	What is the strength of your "after-sales service" team?	

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	FORM	

3[#]	What is the response time after receiving complaints from the customers? Provide evidence.	
4[#]	Customer complaints handling system (Submit list of customer complaints & status for the last three years) Please furnish complete list of complaints attended to during last one year.	
5[#]	How do you keep your “after-sales service” team updated?	
6[#]	Provide certificate from 02 customers (end user) for satisfactory after sails services.	

Declaration by Director/ Partner/ Proprietor

I declare that the information furnished above and attached documents are correct to the best of my knowledge, I undertake to inform you at the earliest any change(s) in the details mentioned above.

Signature and Date

Name & Designation

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TO BE FILLED BY MAIN CONTRACTOR FOR SUB-VENDOR (MC)

Sr. No.	Parameters	Supplier response (along with supporting document)
1	Name and address of sub-vendor:	
2 (a)	Type of equipment / item / process / service for which approval is sought:	
2 (b)	Details of equipment / item / process / service for which approval is sought (i.e. Rating, capacity, type, size, weight, etc.):	
3	Experience of main contractor with sub-vendor:	
(a)#	Since how many years sub-vendor is registered with you for proposed type of equipment / item / process / services (furnish documentary evidence):	
4#	Whether sub-vendor is meeting the qualification criteria indicated in the technical specification (furnish documentary evidence).	
5#	Sub-vendor rating as per contractor's internal procedure in the scale 0-10 or 0-100% (furnish documentary evidence).	
6#	Any dispute of main contractor with vendor during execution of last 05 contracts.	
7#	Have you ever de-listed or put in temporary suspension the proposed sub-vendor? If yes, please provide the reason for same.	
8	Please indicate the reason for re-approving / re-listing the sub-vendor.	

I declare that the information furnished by Sub-vendor has been verified and found in order / minor changes which have been marked and initialed on this form itself / observed the following discrepancies.

(Signature & Designation)

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	FORM	

**GUIDELINES TO SUPPLIERS FOR FILLING-UP VENDOR/SUPPLIER
REGISTRATION FORM**

1. All columns are to be filled up properly in the space provided for. Wherever it is not applicable / not available, please mention "Not Applicable" / "Not Available". All pages of the form are to be signed along with seal by the authorized signatory.
2. A separate sheet may be attached if the space provided is insufficient or additional information is to be given, Please put proper identification tag on the separately attached sheet.
3. Any information / clarification required by SAPDC/ Consultant during evaluation must be given expeditiously.
4. Please ensure that all required enclosures are attached with the filled up Vendor Registration Form.
5. Marks shall be awarded on the basis of documentary evidences submitted by Vendor / sub-vendor wherever called in vendor / sub-vendor assessment form.
6. Incomplete or incorrect forms will be rejected.
7. Please fill up the check list given below and send along with the vendor registration forms to SAPDC/Consultant.
8. In case any information found incorrect / false, the vendor shall be rejected / de-listed at any stage.
9. Information with # marks is score able.
10. Accepting or rejecting a vendor is sole discretion of SAPDC.
11. Product catalogue / manual for the proposed item / equipment / process / service, if available, shall be submitted alongwith other documents.

Furnish following information/Documents:-

Sr. No.	Description	Yes / No	Page No / Annexure
1	Latest audited annual account.		
2	Balance Sheet.		

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	FORM	

3	Valid Income Tax Clearance Certificate.		
4	Details of Pending Arbitration cases.		
5	Details of pending disputes with Statutory Authorities.		
6	Organization chart		
7	Copy of Performance certificate (minimum 03)		
8	Copy of minimum three (03) completion certificates of similar work / service.		
9	Letter of approval from ASME / NTPC/ EIL / Railway / Lloyds / Power Grid etc. if any.		
10	ISO: 9001 certificate		
11	Quality Manual		
12	ISO: 14000 certificate		
13	OHSAS, ISO 18000 certificate		
14	Experience list		
15	Type test report & approval certificate		
16	Product Approval certificate from national / international agency.		
17	Quality award certificate		
18	Process and Personnel qualification certificates		
19	Copy of registration / enlistment with reputed / large organizations		
20	Detail of existing clients and details such as address, contact number and mail address.		
21	List of works / projects of similar nature executed with documentary evidences of works executed in last 02 years.		
22	Other documents mentioned elsewhere in vendor / sub-vendor assessment form.		

Designation)

(Signature &

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FORM	

	MANUFACTURING / FIELD QUALITY ASSURANCE PLAN		CONTRACTOR NAME, ADDRESS & LOGO
PROJECT NAME (MW)	SUB-ITEM	QAP NO.	REV. NO
ITEM DESCRIPTION	ISSUE DATE	SUB-CONTRACTOR NAME, ADDRESS & LOGO	
SR. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS
1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7
5	6	7	8
6	7	8	9
7	8	9	10
8	9	10	11

LEGENDS

M	MANUFACTURER PERFORM	C	CONTRACTOR VERIFICATION OF RECORDS	S	SAPDC LTD.
IR	INSPECTION REPORT	V	DRAWING	W	WITNESS / CHP
MA	MAJOR MEASUREMENT	DRG	MINOR	CHP	CUSTOMER HOLD POINT
ME	CERTIFICATE OF COMPLIANCE TO TS/STANDARD REQUIREMENT WITHOUT ANY CHECK LIST OF TESTS CARRIED OUT.	MN	NDT	CR	CRITICAL
TR1	CERTIFICATE OF COMPLIANCE TO TS/STANDARD REQUIREMENT WITH ANY CHECK LIST OF TESTS CARRIED OUT.	TR2	NON DESTRUCTIVE TESTING	HT	HEAT TREATMENT
				TR3	TEST REPORT/TEST CERTIFICATE WITH TEST RESULTS BASED ON SPECIFIC INSPECTION & TESTING AT MANUFACTURER FACILITY/NABL APPROVED LAB.

NOTE: QAP SHALL BE READ IN CONJUNCTION WITH QUALITY ASSURANCE REQUIREMENT GIVEN AS PART OF TECHNICAL SPECIFICATION.

MANUFACTURER / SUB-CONTRACTOR:	CONTRACTOR:	FOR SAPDC USE:	REFERENCE DOC NO. OF SAPDC:
PREPARED BY:	REVIEWED BY	REVIEWED BY	APPROVED BY
NAME, DESIGNATION & SIGNATURE	NAME, DESIGNATION & SIGNATURE	NAME & SIGNATURE	SIGNATURE & SEAL

Prepared By:	Reviewed By:	Approved By:
		Process Owner

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FORM		

NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
	PAGE 1 of 5

PART-A (Proposal of Disposition of Non Conformity)

Please read instructions carefully before filling up the form and attach separate sheet wherever required.

Contract No.	CATEGORY OF NON CONFORMITY (Please refer instruction no.1&Tick appropriate)
Package Unit No.	
Supplier/ Contractor	
Sub-Vendor	
Place of Manufacture	
	MAJOR <input type="checkbox"/> MINOR <input type="checkbox"/>

DETAILS

ITEM DESCRIPTION: _____ IDENTIFICATION NO. _____

RANGE/SIZE/TYPE: _____ QUALITY PLAN NO.: _____
& CLAUSE NO. _____

STAGE OF NON-CONFORMITY

DESIGN (A) /RAW MATERIAL (B) /ASSEMBLY (C) / IN PROCESS (D)-Specify _____/
 TESTING (E)/ STORAGE (F) /HANDLING & TRANSPORTATION (G) /ERECTION &
 COMMISSIONING (H) /ANY OTHER (I) (SPECIFY) _____

NON CONFORMITY-DESCRIPTION WITH CAUSE (Attach Relevant Drawings/ Details):

PROPOSED DISPOSITION WITH JUSTIFICATION(For Correction): **Disposition Code**
 (Note: Attach Details including design calculation)

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NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
	PAGE 2 of 5

STEPS TO PREVENT RECCURANCE (For Corrective Action):

ENCLOSURE SUBMITTED BY CONTRACTOR:-

- DRAWINGS/ DETAILS
 INSPECTION REPORT
 ROOT CAUSE ANALYSIS
 PROCEDURE OF DISPOSAL OF NCR
 ANY OTHER (Please specify)_____

DATE	NAME & DESIGN	SIG.OF CONTRACTOR	SEAL
FINAL DISPOSITIONING BY SAPDC			Disposition Code
INCHARGE of RIO or FQA (In case of Minor) SAPDC (In case of Major)			<input style="width: 50px; height: 20px;" type="text"/>

DATE	NAME & DESIG.	SIGNATURE
------	---------------	-----------

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NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
	PAGE 3 of 5
FOR SAPDC INTERNAL USE ONLY	
RECOMMENDATION of INCHARGE of RIO or FQA (In case of Major)/ CONCERNED SAPDC 's INSPECTION/ SITE ENGINEER (In case of Minor)	Disposition Code <input type="text"/>
DATE	NAME & DESIG.
SIGNATURE	
RECOMMENDATION OF SAPDC CONCERNED ENGINEER	Disposition Code <input type="text"/>
DATE	NAME & DESIG.
SIGNATURE	
RECOMMENDATION OF SAPDC (FOR MAJOR CATEGORY) (Comments of Engineering / Others deptt as applicable to be considered)	
DATE	NAME & DESIG.
SIGNATURE	

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NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
	PAGE 4 of 5

PART B (Verification of Corrections of Non- Conformity)
(Filled after Completion of corrections of Non-Conformity)

ACTION TAKEN BY SUPPLIER/ CONTRACTOR (Attach Report of verification)

DATE	NAME & DESIGN	SIG.OF SUPPLIER/ CONTRACTOR	SEAL
------	---------------	-----------------------------	------

VERIFICATION BY SAPDC'S SITE ENGINEER/ INSPECTION ENGINEER

DATE	NAME & DESIG.	SIGNATURE	
IN-CHARGE of RIO/ FQA			
DATE	NAME & DESIG.	SIGNATURE	

COMMENTS OF SAPDC ENGINEER

DATE	NAME & DESIG.	SIGNATURE	
GROUP HEAD			
DATE	NAME & DESIG.	SIGNATURE	
HOD			
DATE	NAME & DESIG.	SIGNATURE	

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FORM		

NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
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INSTRUCTIONS

1. 'MAJOR' NONCONFORMITY IS DEFINED AS DEPARTURE FROM SPECIFICATION WHICH AFFECTS PERFORMANCE RELIABILITY. SAFETY INTERCHANGEABILITY. ERECTION, COMMISSIONING OR WORKING LIFE ALL OTHER NON-CONFORMITIES SHALL BE TREATED AS CATEGORY 'MINOR'.
2. ACCEPTANCE OF DISPOSITIONED NO N-CONFORMANCE IS WITHOUT PREJUDICE TO SAPDC RIGHT TO CLAIM COMMERCIAL REBATE AND DOES NOT ABSOLVE CONTRACTUAL OBLIGATIONS.
3. OBTAINING APPROVAL OF STATUTORY AUTHORITY IF ANY W.R.T. ABOVE NON CONFORMANCE IS THE RESPONSIBILITY OF SUPPLIER/ CONTRACTOR.
4. DISPOSITIONING OF THIS NON-CONFORMANCE IS FOR THIS SPECIFIC CASE ONLY AND NOT TO BE REGARDED AS PRECEDENCE.
5. **DISPOSITION CODE** THE NON-CONFORMANCE SHALL BE DISPOSITIONED AS UNDER BY SAPDC AND SUPPLIER. (GIVE CODE AT APPROPRIATE BOXES):-
 (01) NC-REJECTED (02) NC- CONDITIONALLY ACCEPTED (SPECIFY CONDITION) (03) NC-ACCEPTED AS-IT-IS (04) NC-ACCEPTED WITH REPAIR.
6. **NC NUMBER** - THIS NO. SHALL BE ALLOTTED BY SAPDC AND SHALL HAVE SAPDC,PROJECT NAME, PACKAGE, FOLLOWED BY RUNNING SERIAL NO. & ENTER TO NC REPORT BY RIO/ FQA/ CQAI.

RESPONSIBILITIES OF CONTRACTOR

1. ASCERTAIN EXACT NATURE OF NON-CONFORMANCE AND ALONGWITH SUPPORTING DRAWING OF ITEMS/ EQUIPMENT ETC WITH WHICH NON-CONFORMANCE EXISTS.
2. IDENTIFY THE CAUSE OF NON CONFORMITY.
3. DECIDE ON CODE OF DISPOSING.
4. FINALISE THE CAUSE OF NON-CONFORMITY AND PROPOSE CORRECTIVE ACTION.
5. ENSURE AND CERTIFY THAT THE PRODUCT QUALITY PERFORMANCE. RELIABILITY AND WORKING LIFE IS NOT AFFECTED FOR MINOR NON-CONFORMITIES AND QUANTIFY THE EXTENT TO WHICH IT IS AFFECTED IN THE CASE OF CATEGORY 'MAJOR' NON-CONFORMITIES.
6. IMPLEMENT AGREED CORRECTIVE ACTION IN A TIME BOUND PROGRAMME AND PROVIDE FEEDBACK AS PER PART-B OF THE FORMAT

RESPONSIBILITIES OF RIO/ FQA

1. IDENTIFY THE PRODUCT APPROPRIATELY.
2. ANALYSE THE CAUSE OF NON-CONFORMITY AND PROPOSE RECOMMENDATION

FORM	FORM NO.: F-060-04 PAGE: 1 of 1 ISSUE: 2.0 REV. 00 DATE: 30/01/2023

LIST OF COMPONENT / EQUIPMENT / BOUGHT OUT ITEMS REQUIRING QUALITY PLAN APPROVAL and QAP SUBMISSION SCHEDULE

Sr. No.	Main Item	Components / Sub-Components	Quality Plan No.	Quality Plan Submission date	Quality Plan Category	Whether supplied by Contractor / his sub-vendor / Bought Out Item.
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Note: -

- 1) In case the component / Item is being supplied by Contractor having multi Units / Works, please also indicate the place of manufacture in Column (7).
- 2) The proposal of bidder for detailing / listing of Quality Plan shall be as per bidder's best quality practices and Quality Assurance Test Requirement (QATR) given elsewhere in the technical specification. The items requiring the quality plan approval shall necessarily be included in Billing Break-up (BBU).
- 3) Quality plan category indicated at Column (6) shall be categorized and proposed by bidder as per the following on the basis of Quality Assurance Test Requirement (QATR) given elsewhere in technical specification and shall be mutually agreed with SAPDC/Consultant prior to placement of award
 - i) Category "I" - Quality Plan approved by SAPDC/Consultant and material accepted on the basis of physical inspection / TC review / Certificate of compliance, as identified in Quality Assurance Plan.
 - ii) Category "II" - Quality Plan approved by main contractor and material accepted on the basis of Certificate of Compliance (COC) issued by main contractor.
- 4) The items subsequently identified in detailed engineering or in approved Billing Break-up, but not appearing in the list shall be added in the same manner during post award stage.

Date:

Signature with Seal

Place:

Name & Designation

FORM	FORM NO.: F-060-05 PAGE: 1 of 1 ISSUE: 2.0 REV. 00 DATE: 30/01/2023

INSPECTION CALL REQUEST

Inspection Call No.		Date:				
Project:		Contract No. :				
Contractor/Supplier's Name & Address:		Sub-vendor/Sub-Supplier's Name & Address:				
Contact Person:		Contact Person:				
Telephone/Mobile No.:		Telephone/Mobile No.:				
Fax No.		Fax No.				
email ID:		email ID:				
Details of Equipment with Unit No.:						
Sr. No.	Equipment/Item Description and Sr. No.	Unit No.	BBU Ref.	QAP No. & Rev. No.	Relevant QAP Clause No.	Approved Drawing No. & Rev. No.
Status of Type Tests		Approved / Not Approved / Not Applicable		Place of Inspection:		
Proposed date of Inspection:				Anticipated Working Days Required		
Status of internal inspection by Vendor/sub-vendor			Completed <input type="checkbox"/>	In-progress <input type="checkbox"/>	Yet to be done <input type="checkbox"/>	
Tentative date of completion of internal inspection in case inspection is in-progress/yet to be done:						
Note: Readiness status is to be submitted separately after completion of internal inspection by Manufacturer.						

Date:
Place:

Signature
Name
Designation
Department
Company

FORM	FORM NO.: F-060-06 PAGE: 1 of 2 ISSUE: 2.0 REV. 00 DATE: 30/01/2023

**ATTACHMENT - 13
CHECK LIST FOR DOCUMENT SUBMISSION BY BIDDER WITH REGARD TO
QUALITY ASSURANCE PROGRAMME**

BIDDER'S NAME & ADDRESS:

**To
SAPDC PVT. LTD.
SAPDC OFFICE COMPLEX
KHANDBARI MUNICIPALITY, TUMLINGTAR, NEPAL**

DEAR SIRs,

WE HEREBY CONFIRM THAT WE WILL FOLLOW THE QUALITY ASSURANCE PROGRAMME (CONTAINING OVERALL QUALITY MANAGEMENT AND PROCEDURES), AS PROVIDED IN THE BID DOCUMENTS AND ALL RELEVANT DETAILS / DOCUMENTS REQUIRED TO BE SUBMITTED ALONGWITH THE BID AS PER **CL. NO. 1.20** OF GENERAL TECHNICAL SPECIFICATION.

SR NO.	DOCUMENT DESCRIPTION	SUBMITTED (YES / NO)
1	ORGANISATION STRUCTURE FOR THE MANAGEMENT AND IMPLEMENTATION OF THE PROPOSED QUALITY ASSURANCE PROGRAMME	
2	QUALITY SYSTEM MANUAL	
3	DESIGN CONTROL SYSTEMS	
4	DOCUMENTATION AND DATA CONTROL SYSTEMS	
5	QUALIFICATION/EXPERIENCE OF BIDDER'S KEY PERSONNEL.	
6	PROCEDURE FOR PURCHASE OF MATERIAL, PARTS, COMPONENTS AND SELECTION OF SUB-VENDOR'S SERVICES INCLUDING VENDOR ANALYSIS, SOURCE INSPECTION, INCOMING RAW-MATERIAL INSPECTION, VERIFICATION OF MATERIALS PURCHASED, ETC.	
7	SYSTEM FOR SHOP MANUFACTURING AND SITE ERECTION CONTROLS INCLUDING PROCESS, FABRICATION AND ASSEMBLY.	
8	CONTROL OF NON-CONFORMING ITEMS AND SYSTEM FOR CORRECTIVE ACTIONS AND RESOLUTION OF DEVIATIONS.	
9	CONTROL OF CALIBRATION AND TESTING OF MEASURING / TESTING EQUIPMENT.	
10	SYSTEM FOR QUALITY AUDITS.	
11	SYSTEM FOR IDENTIFICATION AND APPRAISAL OF INSPECTION STATUS.	
12	SYSTEM FOR AUTHORISING RELEASE OF MANUFACTURED PRODUCT TO THE PURCHASER.	
13	SYSTEM FOR TRANSPORTATION /DELIVERY, HANDLING, STORAGE AND PRESERVATION.	
14	SYSTEM FOR MAINTENANCE OF RECORDS.	

I HEREBY CONFIRM THAT GENERAL QUALITY ASSURANCE REQUIREMENTS AND QUALITY ASSURANCE TEST REQUIREMENTS (QATRs) HAVE BEEN READ IN

Prepared By:	Reviewed By:	Approved By:
		Process Owner

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DETAIL AND SAME ARE *ACCEPTED / ACCEPTED WITH DEVIATIONS MENTIONED IN SCHEDULE FOR DEVIATION.

Date:

Signature with Seal

Place:

Name & Designation

NOTE:

*Strike whichever is not applicable

Prepared By:	Reviewed By:	Approved By:
		Process Owner

Annexure

**List of Deviations from Technical Specifications
(To be furnished by the Bidders)**

Sr. No. 1	Clause No. 2	Deviation 3	Remarks/Justifications 4

(Signature of Bidder)

**SAPDC Pvt. Ltd.
Operational Acceptance Certificate**

Name of the Contract.....

Contract No.

Name of the Contractor

Pursuant to GCC Clause No. (operational acceptance Certificate) of the General Conditions of the Contract entered into between M/s (Name of contractor) and SAPDC Pvt. Ltd. dated (date), relating to the (Brief description of the Works), it is hereby certified that the following part(s) of the equipment was (were) complete on the date specified below, and that in accordance with the terms of the Contract, the Purchaser hereby takes over the said part(s) of the Works on the date mentioned below:

1. Description of the Work/equipment or part thereof:
2. Date of Taking Over:
3. Commissioning report:

The contractor undertakes to complete the deficiencies/outstanding items listed in the attachment hereto on priority.

(Contractor)

(Engineer)

Date

Place

References

Following publications referred to in the Bidding document for designation only, form a part of these specifications.

DIN-19704	Hydraulic Steel structures criteria for Design and Calculation
DIN-17440	Technical delivery conditions for stainless steel plates, hot rolled strip, and bars for pressure purposes, drawn wires and forgings.
DIN- 17100	Steel for general structure purpose Quality Standard
IS 28: 1985	Phosphor bronze ingots and castings (fourth revision)
IS 305: 1981	Aluminum bronze ingots and castings (second revision)
IS 318: 1981	Leaded tin bronze ingots and castings (second revision)
IS 325: 1978	Three-phase induction motors (fourth revision)
IS 456:1978	Code of Practice for plain and Reinforced concrete (third revision) with amendment No.1
IS 800: 1984	Code for practice for general construction in steel (second revision)
IS 807:1976	Code of practice for design, manufacture, erection and testing (structural portion) of cranes and hoists (first revision)
IS 808 (Part 1) 1989	Dimension for hot rolled steel beams column, angle sections.
IS 900:1992	Code of practice for installation and maintenance of induction motors (second revision)
IS 1028:197	Silicon bronze ingots and castings (second revision)
IS 1030:1982	Carbon steel castings for general Engineering purposes (third revision)
IS 1231:1974	Dimensions of three-phase foot-mounted induction motors (third revision) (Amendments 4)
IS 1239 (Part I)1990	Mild steel tubes, tubular and other wrought steel fittings: Part 1 mild steel tubes (fifth revision)
IS 1239 (2): 1991	Mild steel tubes, tubular and other wrought steel fittings: Part 2 Mild steel tubular and other wrought steel pipe fittings (third revision)
IS 1363 (Part 1): 1984	Hexagon head bolts, screws and nuts of product grade C: Part 1 Hexagon head bolts (size range M5 to M36)
IS 1363 (Part 2) : 1984	Hexagon head bolts, screws and nuts of product grade C: Part 2 Hexagon head screws (size range M5 to M36) (second revision)
IS 1363 (Part 2) : 1983	Hexagon head bolts, screws and nuts of product grade C: Part 3 Hexagon nuts (size range M5 to M36) (second revision)

IS 1364 (Part 1) : 1983	Specification for Hexagon Head Bolts, screws and nuts of product grade A and B: Part 1 Hexagon head bolts (size range M3 to M36) (second revision)
IS 1364 (Part 2) : 1983	Specification for Hexagon Head Bolts, screws and nuts of product grade A and B: Part 2 Hexagon screws (size range M3 to M36) (second revision)
IS 1364 (Part 3)	Hexagon head bolts, screws and nuts of product grades A&B: Part 3 Hexagon nuts (Size range M1.6 to M36).
IS 1364 (Part 4)	Hexagon head bolts, screws and nuts of product grades A&B: Part 4 Part 4 Hexagon thin nuts (Chamfered) (size rouge M1.6 to M10)
IS 1364 (Part 5)	Hexagon head bolts, screws and nuts of product grades A&B: Part 5 Hexagon thin nuts (un chamfered) (size rouge M1.6 to M10)
IS 1367 (Part 1) : 1980	Technical supply conditions for threaded steel fasteners, Part 1, introduction and general information (second revision)
IS 1367 (Part 2) :1979	Technical supply conditions for threaded steel fasteners, Part 2, product grades and tolerances (second revision)
IS 1367 (Part 3) : 1991	Technical supply conditions for threaded steel fasteners, Part 3, mechanical properties and test methods for bolts, screws and studs with full loadability (second revision) (with amendment No.1)
IS 1367 (Part 5) : 1980	Technical supply conditions for threaded steel fasteners, Part 5, mechanical properties and test methods for setscrews and similar threaded fasteners not under tensile stresses.
IS 1367 (Part 6) : 1980	Technical supply conditions for threaded steel fasteners, Part 6, mechanical properties and test methods for nuts with specified proof loads (second revision)
IS 1367 (Part 7) : 1980	Technical supply conditions for threaded steel fasteners, Part 7, mechanical properties and test methods for nuts without specified proof loads (second revision)
IS 1367 (Part 9) : 1980	Technical supply conditions for threaded steel fasteners, Part 9, surface discontinuities on bolts, screws and studs (second revision)
IS 1367 (Part 10) : 1980	Technical supply conditions for threaded steel fasteners, Part 10, surface discontinuities on nuts (second revision),
IS 1367 (Part 12) : 1981	Technical supply conditions for threaded steel fasteners, Part 12, phosphate coatings on treaded fasteners.
IS 1367 (Part 13) : 1983	Technical supply conditions for threaded steel fasteners, Part 13, Hot dip galvanized coatings on threaded fastener (second revision)

IS 1367 (Part 14) : 1984	Technical supply conditions for threaded steel fasteners, Part 14, stainless steel threaded fasteners (second revision)
IS 1367 (Part 16) : 1979	Technical supply conditions for threaded steel fasteners, Part 16 Designation system and symbols (first revision)
IS 1367 (Part 18) : 1979	Technical supply conditions for threaded steel fasteners, Part 18 Making and mode of livery (second revision)
IS 1458: 1965	Railway bronze ingots and casting (revised) (amendments 4)
IS 1570 (Part 5) : 1985	Schedule for wrought steels: part 5 stainless and heat resisting steels, (Second revision).
IS 1608:1972	Method of tensile testing of steel products (first revision) (Amendment. 1)
IS 1875:1992	Carbon steel billets, blooms, slabs and bars for forging (fifth revision).
IS 1893:1984	Criteria for earthquake resistant design of structures (fourth revision) (amendment 1)
IS 2002:1982	Steel plates for pressure vessels for intermediate and high temperature service including boilers (first revision) (amendment 1)
IS 2004: 1991	Carbon steel forging for general engineering purposes (third revision)
IS 2048:1983	Parallel keys and keyways (second revision) (amendment 1)
IS 2062:1992	Steel for general Structural purposes - Specifications
IS 2147:1962	Degrees of protection provided by enclosures for low voltage switch gear and control gear
IS 2223:1983	Dimensions of flange mounted ac induction motors (first revision) (amendments 2)
IS 2266:1989	Steel, wire ropes for general engineering purpose (third revision)
IS 2291:1990	Tangential keys and keyways (third revision)
IS 2292: 1974	Taper keys and keyways (first version)
IS 2365:1977	Steel wire suspension ropes for lifts, elevators and hoists (first revision)
IS 2485:1979	Drop forged sockets for wire ropes for general engineering purpose (first revision)
IS 2516 (Part 1 / Sec1): 1985	Circuit breakers: Part 1 Requirements and tests, Section 1 voltage not exceeding 1000V ac or 1200 V DC (second revision)
IS 2516 (Part 1/ Sec2): 1980	Circuit breakers: Part 1 Requirement and tests, Section 2 for voltage above 1000V ac (first revision)
IS 2516 (Part 2/	Circuit breakers: Part 2 Rating section 2: for voltage above 1000 V ac (first

Sec2): 1980	revision)
IS 2516 art3/Sec2) : 1980	Circuit breakers: Part 3 Design and construction, section 2 for voltage above 1000 V ac (first revision).
IS 2516 art4/Sec2) : 1980	Circuit breakers: Part 4 Type tests and routine tests, section 2 for voltage above 1000 V ac (first revision)
IS 2516 art5/Sec2) : 1980	Circuit breakers: Part 5 information to be given with enquiries, tenders and orders and rules for transport erection and maintenance section 2 for voltage above 1000 V ac (first revision)
IS 2595:1978	Code of practice for Radiographic testing.
IS 2825:1969	Code for unfired pressure vessels (amendments 5)
IS3177: 1999	Code of practice for electric overhead travelling cranes and gantry cranes other than steel work cranes (first revision)
IS: 3658:1981	Code of practice for liquid penetrant flaw detection
IS: 3664:1981	Code of practice for Ultrasonic pulse echo testing by contact and immersion methods.
IS 3681:1966	General plan for spur and helical gears
IS 3703:1980	Code of Practice for Magnetic Particle Flaw detection.
IS 4058:1967	Accuracy requirements for coarse quality low speed gears.
IS 4460:1967	Method for rating of machine cut spur and helical gears (amendments 2)
IS 4702:1968	Accuracy requirements for high precision gears
IS 4715:1968	Excavators dental, No. Ex ½,3/4,5/6,7/8, 9/10,11/12 and 13/14.
IS 5669:1987	General plan of boundary dimensions for radial rolling bearings (first revision) (ISO Title: Rolling bearing –Radial bearing-Boundary dimensions-General plan)
IS 5692:1988	Tolerances for radial rolling bearings (first revision)
IS 5932:1970	Boundary dimensions for thrust ball bearings with flat seats.
IS 5933:1970	Tolerances for thrust ball bearings with flat seats.
IS 6623:1985	High strength structural nuts (first revision) (amendment 1)
IS 11855:2004	Guidelines for Design and Use of Different Types of Rubber Seals for Hydraulic Gates
IS 6938:1989	Code of practice for design of rope drum and chain hoists for hydraulic gates (first revision)

IS 7307 (Part1):1974	Approval test for welding procedures: Part 1 fusion welding of steel
IS 7310 (Part 1) : 1974	Approval test for welders working to approved welding procedures: Part 1 fusion welding of steel.
IS 7318:1974	Approval tests for welders when welding procedure approval is not required
IS 9968: (Part 1)	Elastomer in insulated Cables Part I for working voltage upto and including 1100V.
IS 9968: (Part 2)	Elastomer in insulated Cables Part 2 for working voltage from 3.3 KV upto and including 11KV.
IS 8130:1984	Conductors for insulated electric cables and flexible cords (first revision)
IS 11639 (Part 1)	Criteria for Structural Design of Penstocks Part 1: Surface Penstocks
IS 11639 (Part 2)	Structural Design of Penstocks- Criteria Part 2: Buried/Embedded Penstocks in Rock
IS 11639 (Part 3)	Structural Design of Penstocks- Criteria Part 3: Specials for Penstocks
IS 12843:1989	Tolerances for erection of steel structures.
IS 4622:2003	Recommendations for Structural Design of Fixed-Wheel Gates
IS 4623:2000	Recommendations for Structural Design of Radial Gates
IS 5620: 1985	Recommendations for Structural Design Criteria for Low Head Slide Gates
IS 9349:1986	Recommendation for structural design of medium and high head slide gates (first revision)
IS 13053:1991	Hydraulic fluid power system- Commissioning and maintenance of complete hydraulic systems – Recommendations
IS 7718:1991	Recommendations for inspection, testing and maintenance of fixed wheel and slide gates.
IS 10210:1993	Criteria for Design of Hydraulic Hoists for Gates
ASME Code divn.1 Section –VIII-I	Boiler and Pressure Vessel Code.
ANSI-B.1.1	Unified Inch Screw Threads.
ANSI B16-11	Steel Pipe Flanges and Flanged Fittings.
ANSI-B 15-11	Forged Steel, Fittings, Socket welding and Threaded.
ANSI B-93.18	Non-Integral Industrial Fluid Power Hydraulic Reservoir.
ANSI 1/NFPA.70	National Electrical Code.
ANSIC 37.90a	Standard Relays and Relays system Associated with Electrical Power

	Apparatus.
ASME Code LOS-5C1,ASTM-SME	Recommended Practices for the Flushing and cleaning of Oil Systems for Lubrication and control of Hydro-Electric Equipment
ASTM A-7/A27M	Specifications for steel castings, carbon for General Applications.
ASTM A-6/A36M	Specifications for Structural Steel.
ASTM A 123	Specifications for Zinc (Hot Dip Galvanized) coating for Iron and Steel Hardware.
ASTM A 153	Specifications for Stainless and Heat Resisting Bars and Shapes.
ASTM A 276	Specification for Stainless and Heat Resisting Bars and Shapes.
ASTM A 325	Specification for High Strength Bolts for Structural Steel Joints.
ASTM A 490	Specification for Heat Treated Structural Bolts. 150 Kasi (1035 Mpa) Tensile Strength.
ASTM A 564	Specifications for Hot Rolled and Cold Finished Age Hardening. Stainless and Heat Resisting Steel Bars, Wires and Shapes.
ASTM A572M	Specification for High Strength, Low Alloy Columbium – Vanadium Steel of Structural Quality.
JIC Standards	Hydraulic Standards for Industrial Equipments.
NAS 1638	Cleanliness requirements of Parts used in Hydraulic Systems.
CWC Manual	Manual on Design, Fabrication, Erection and Maintenance of Steel Penstocks
ASTM A 668	Specifications for Steel Forgings, Carbon Alloy for general industrial use.

SJVN ARUN-3 POWER DEVELOPMENT CO. (P) LTD.

(A company promoted by SJVN Ltd., a joint venture of Govt. of India and Govt. of HP)



ARUN-3 HYDRO ELECTRIC PROJECT (900 MW)

DISTT. SANKHUWASABHA, NEPAL

Tender No.: ICB-P&C-AHEP-HM-C-5-/2023-90

**HYDRO-MECHANICAL WORKS- PRESSURE SHAFT STEEL LINER OF ARUN-3 HYDROELECTRIC PROJECT (900 MW) LOCATED IN
SANKHUWASABHA DISTT. IN NEPAL**

Volume-IV

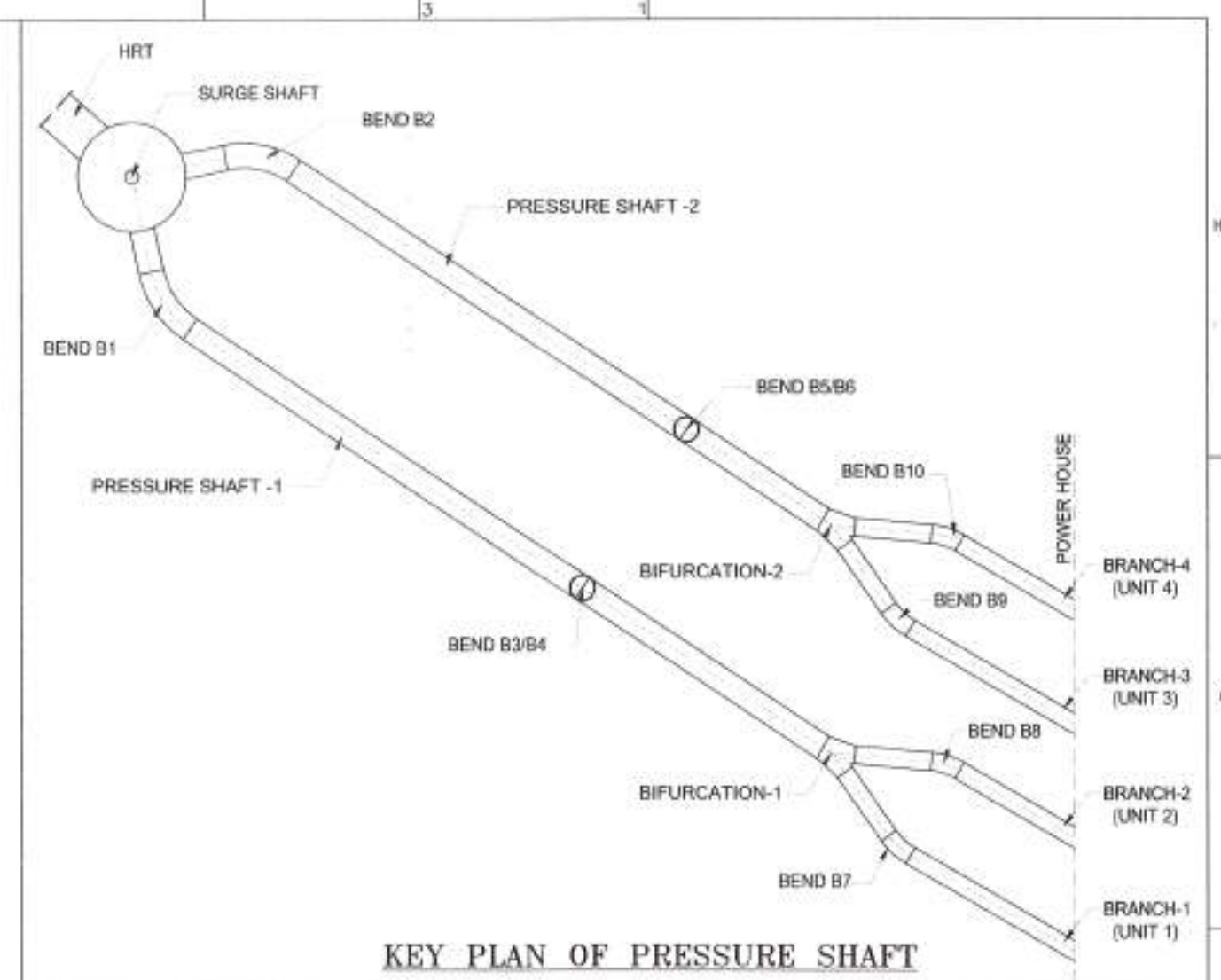
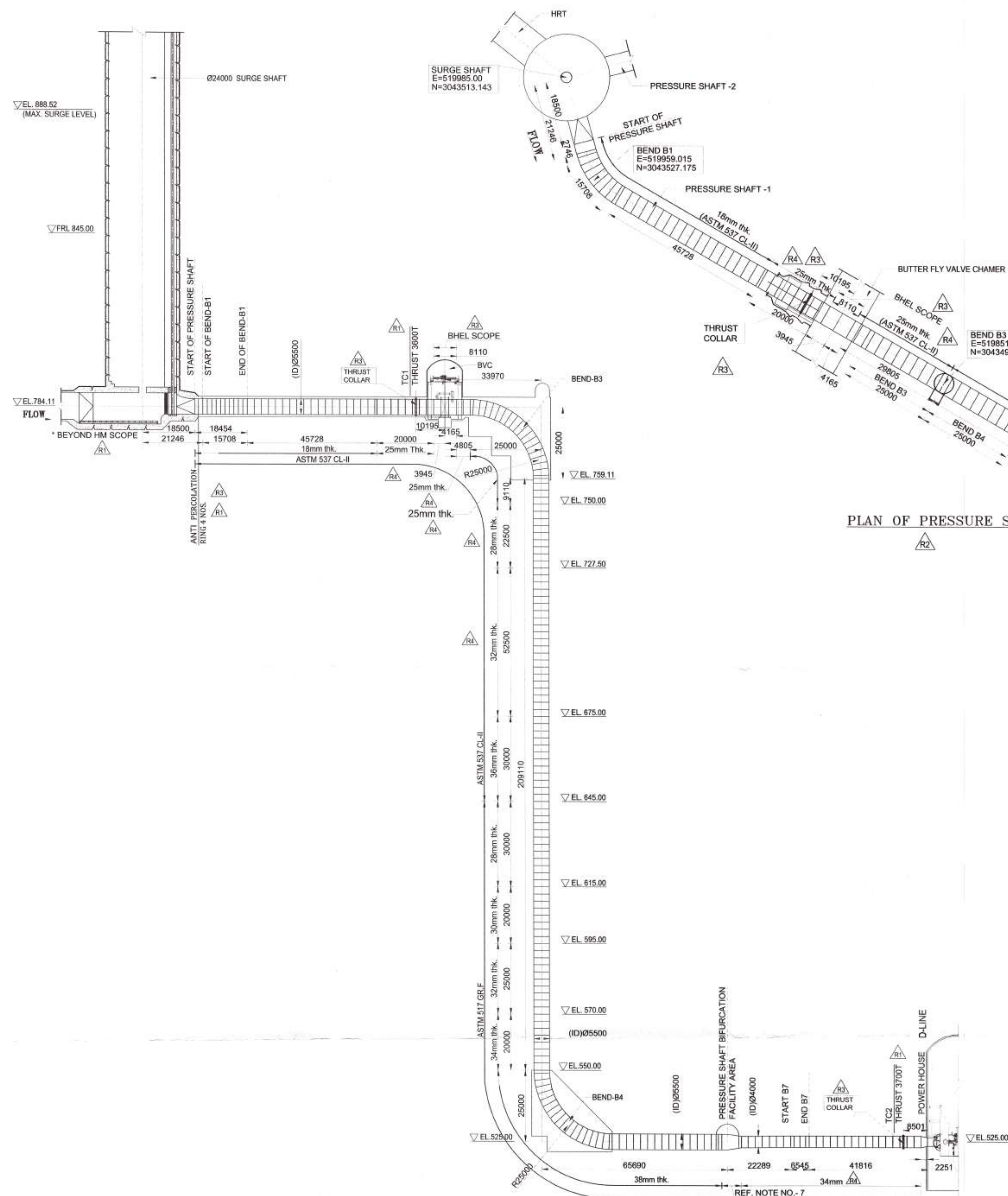
➤ **TENDER DRAWINGS**

TUMLINGTAR, NEPAL

FEBRUARY, 2023

INDEX

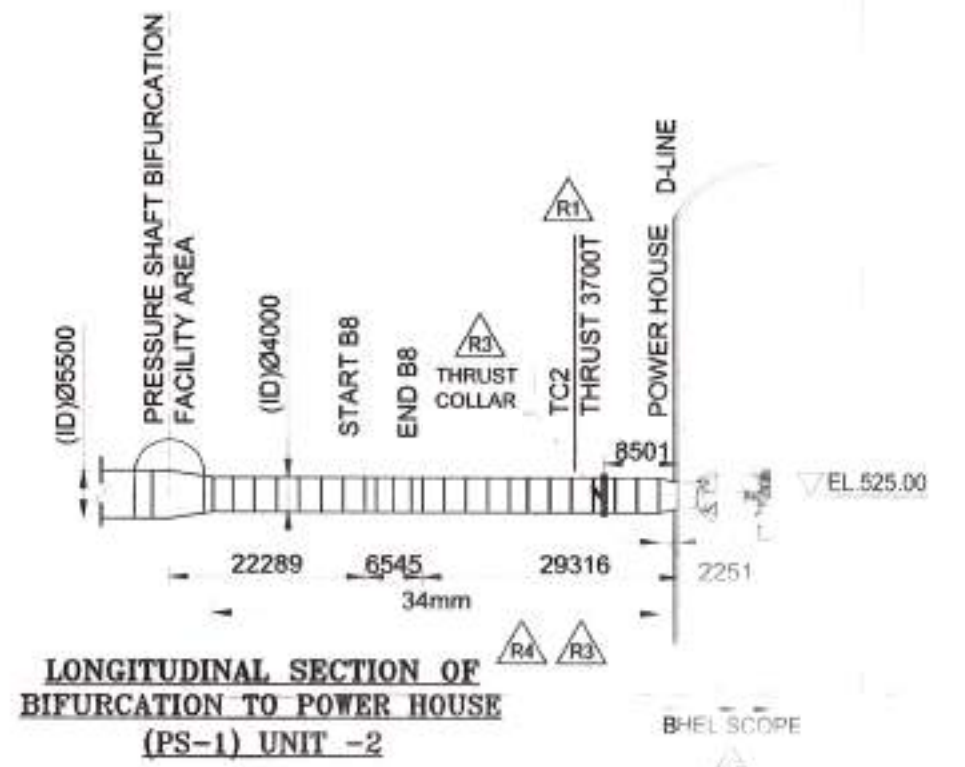
Sr. No.	Title of Drawing	Drawing No.
1	Pressure Shaft Steel Liner – PS1 & UNIT 1 & 2 General Layout	ARUN-III HEP/PSL/1200
2	Pressure Shaft Steel Liner – PS1 & UNIT 3 & 4 General Layout	ARUN-III HEP/PSL/1200
3	G.A. & Development of Bifurcation for PS-1 & 2 (ID 5500mm TO ID 4000mm) (Sheet 1 of 4)	ARUN-III HEP/PSSL/1218A
4	G.A. & Development of Bifurcation for PS-1 & 2 (ID 5500mm TO ID 4000mm) (Sheet 2 of 4)	ARUN-III HEP/PSSL/1218A
5	G.A. & Development of Bifurcation for PS-1 & 2 (ID 5500mm TO ID 4000mm) (Sheet 3 of 4)	ARUN-III HEP/PSSL/1218A
6	G.A. & Development of Bifurcation for PS-1 & 2 (ID 5500mm TO ID 4000mm) (Sheet 4 of 4)	ARUN-III HEP/PSSL/1218A
7	General Arrangement & Development of Thrust Collar (OD Ø6264)	ARUN-III HEP/PSSL/1239
8	General Arrangement & Development of Thrust Collar (OD Ø4676)	ARUN-III HEP/PSSL/1217



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
 - NO DIMENSION IS TO BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.
 - THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
 DRG. NO. PS-C2-AR3-C01, DATED: 02 AUGUST, 2019
 DRG. NO. PS-C2-AR3-C02, DATED: 02 AUGUST, 2019
 DRG. NO. PS-C2-AR3-C03, DATED: 02 AUGUST, 2019
 DRG. NO. PS-C2-AR3-C04, DATED: 02 AUGUST, 2019
 DRG. NO. PS-C2-AR3-C05, DATED: 02 AUGUST, 2019
 - DESIGN OF PENSTOCK HAS BEEN CARRIED OUT AS PER ASCE MANUAL NO. 79 (2012)
 - MATERIAL OF PENSTOCK HAS BEEN CONSIDERED AS ASTM A 537 CL II UPTO EL. 645 & REST ALL ASTM A 517 GR F.
 - STIFFENER RING DETAILS
 TOP HORIZONTAL - STANDARD SHELLS WITH THREE STIFFENER RINGS.
 VERTICAL SHAFT AND BOTTOM HORIZONTAL SHELLS WITH TWO STIFFENER RINGS.
 - BIFURCATION THICKNESS TO BE FINALISED DURING ITS DESIGN.

HST TABLE

S.No	Thickness	Diameter	Material	Design pressure Mpa	HST test Pressure Mpa
1	18	5500	ASTM 537 Cl II	1.187	1.7805
2	25	5500	ASTM 537 Cl II	1.743	2.6145
3	28	5500	ASTM 537 Cl II	1.964	2.946
4	32	5500	ASTM 537 Cl II	2.258	3.387
5	36	5500	ASTM 537 Cl II	2.55	3.825
6	28	5500	ASTM 517 Gr F	2.847	4.2705
7	30	5500	ASTM 517 Gr F	3.0442	4.5663
8	32	5500	ASTM 517 Gr F	3.28	4.92
9	34	5500	ASTM 517 Gr F	3.48	5.22
10	38	5500	ASTM 517 Gr F	3.83	5.745
11	34	4000	ASTM 517 Gr F	3.928	5.892



IMPORTANT
 N.B. This approval does not relieve manufacturer of any responsibility for accuracy & correctness of Design, Drawings, Fabrication, Erection, Testing, Commissioning. Satisfactory performance of the equipment on the site & guarantee etc.

LONGITUDINAL SECTION OF SURGE SHAFT TO POWER HOUSE (THROUGH PS-1) UNIT -1

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[Signature]
Sr. MANAGER

SUBMITTED
[Signature]
Dy GENERAL MANAGER

APPROVED
[Signature]
CHIEF GENERAL MANAGER

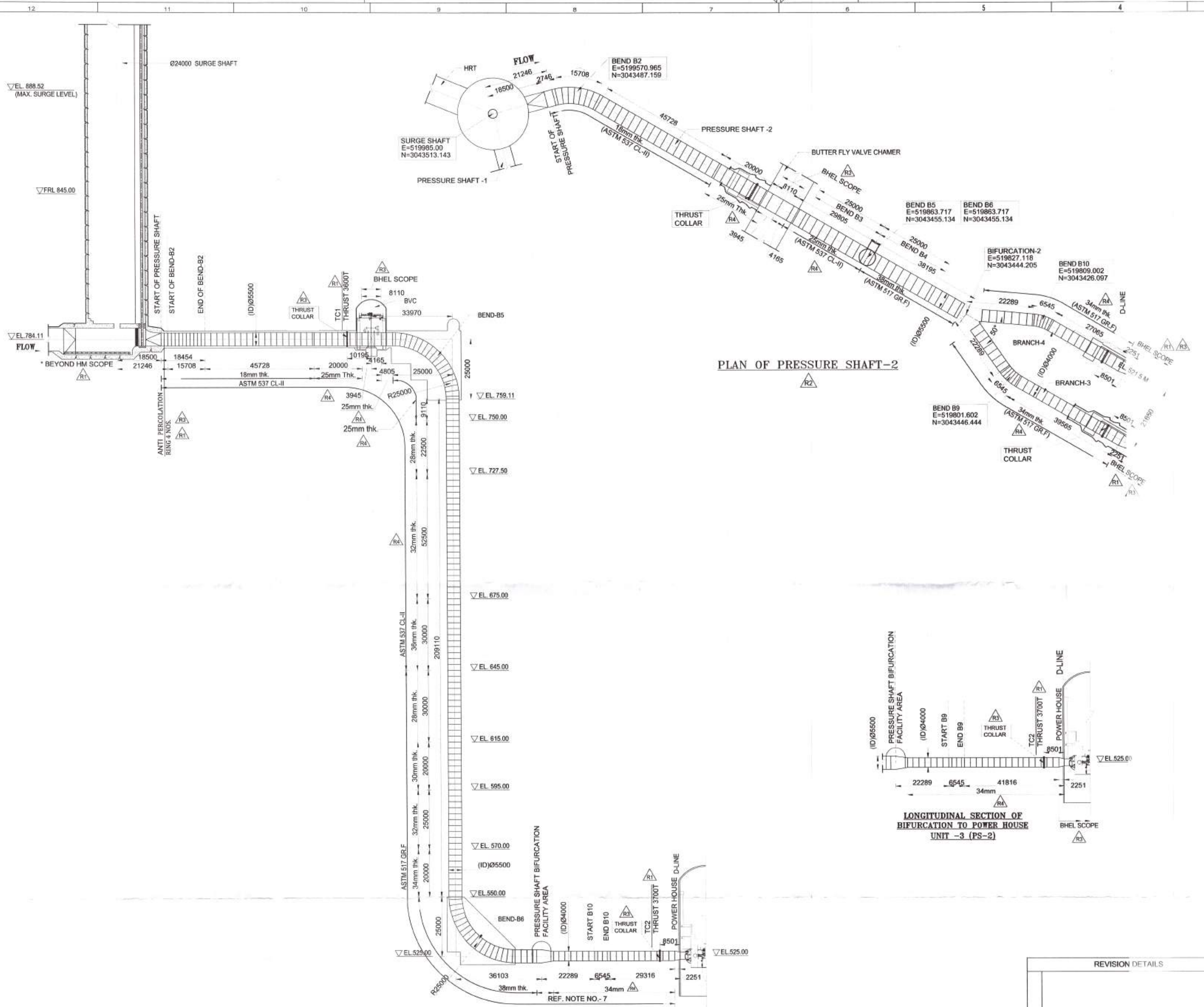
REVISION DETAILS

NO	DESCRIPTION	DATE
R4	DRAWING REVISED AS PER SAPDC MAIL DATED 24.06.2020	24.06.2020
R3	DRAWING REVISED AS PER SAPDC MAIL DATED 18.02.2020	18.02.2020
R2	DRAWING REVISED AS PER SAPDC MAIL DATED 22.12.2019	22.12.2019
R1	20.06.19 TC1, TC2, NICHE, ANTI PERCOLATION RINGS INCORPORATED AS PER SAPDC LETTER NO. 2654 DT. 26.05.19 & E MAIL DT 18.06.2019	18.06.2019
RO	26.04.2019 1ST SUBMISSION	

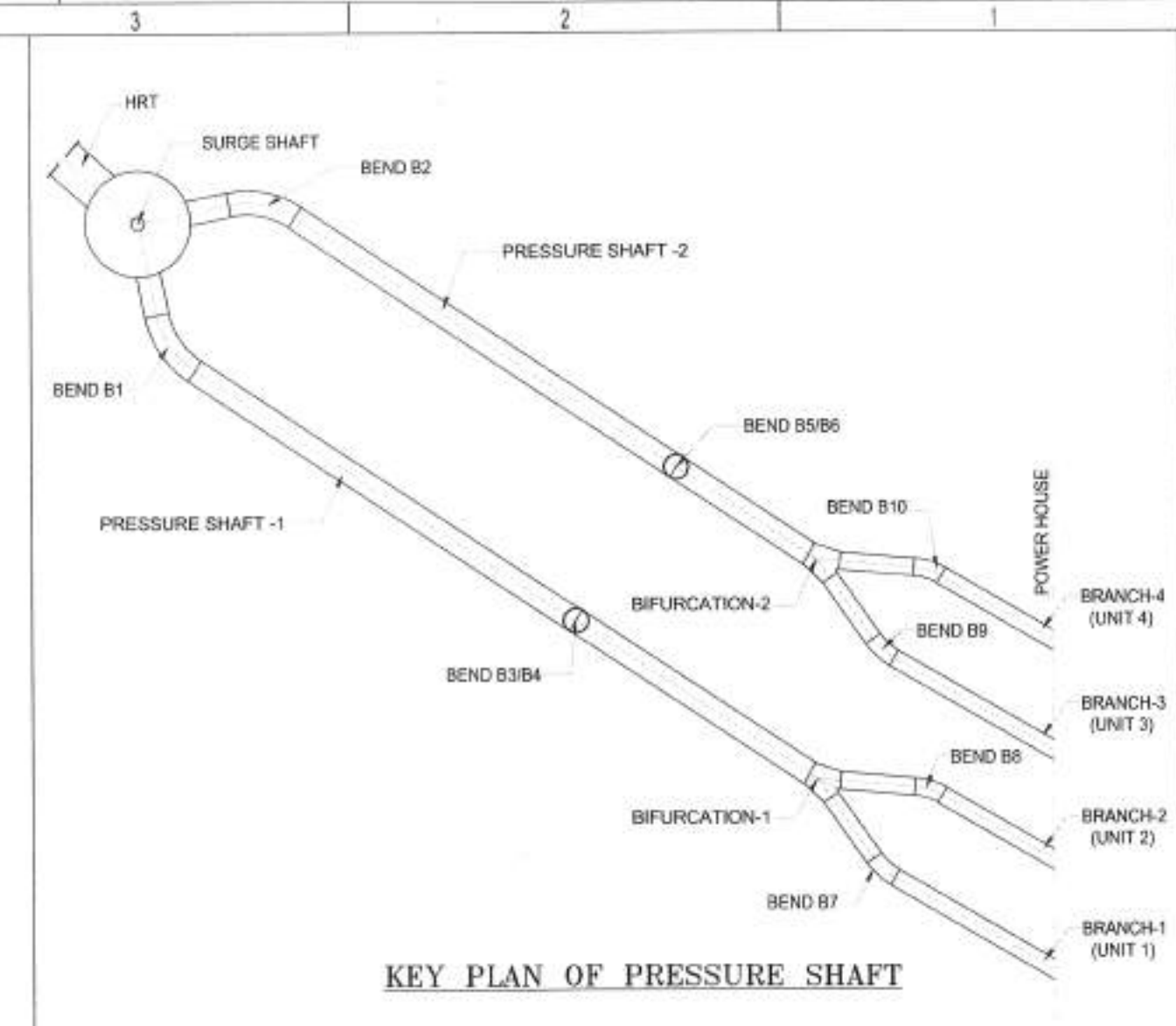
S.No	Item	Paints or coating material	Total No. of coats	DFT
1	External surface which are embedded in concrete	Coat of cement solution mixed with 5% potassium dichromate.	1	
2	Exposed surface of liner	a) Zinc rich epoxy primer	2	Each coat Min of 50 microns but total not more than 150 micron
		b) Cold applied coal tar epoxy paint	3	450 (3x150) micron
3	Interior surface	a) Zinc rich epoxy primer	2	Each coat Min of 50 microns but total not more than 150 micron
		b) Cold applied coal tar epoxy paint	3	450 (3x150) micron

(SH. 1 OF 2)

CONSULTANT	SJVN LIMITED	
CLIENT	SAPDC (P.) LIMITED	
PROJECT	ARUN-III H.E PROJECT	
TITLE	PRESSURE SHAFT STEEL LINER - PS1 & UNIT 1 & 2 GENERAL LAYOUT	
DESIGN BY		DATE OF SUB. 01.07.2020
DRAWN BY		
CHECKED BY		
SIZE	A1	SCALE
	NTS	DRG NO :
		ARUN-III HEP/PSL/1200
		REV-4



PLAN OF PRESSURE SHAFT-2

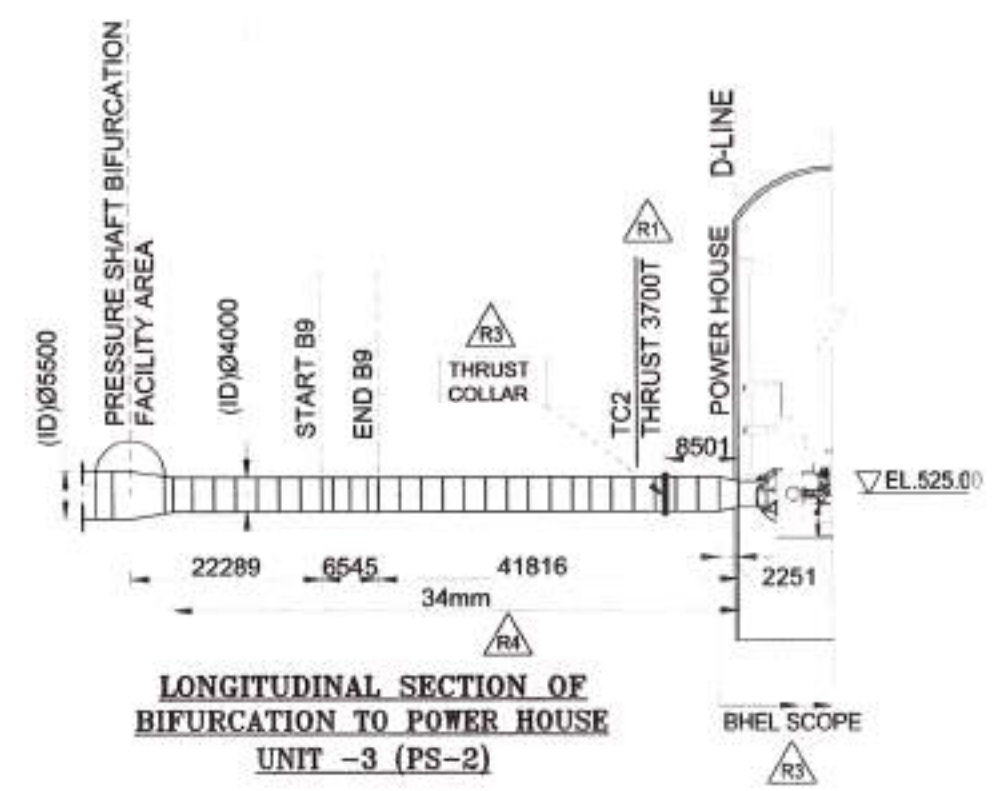


KEY PLAN OF PRESSURE SHAFT

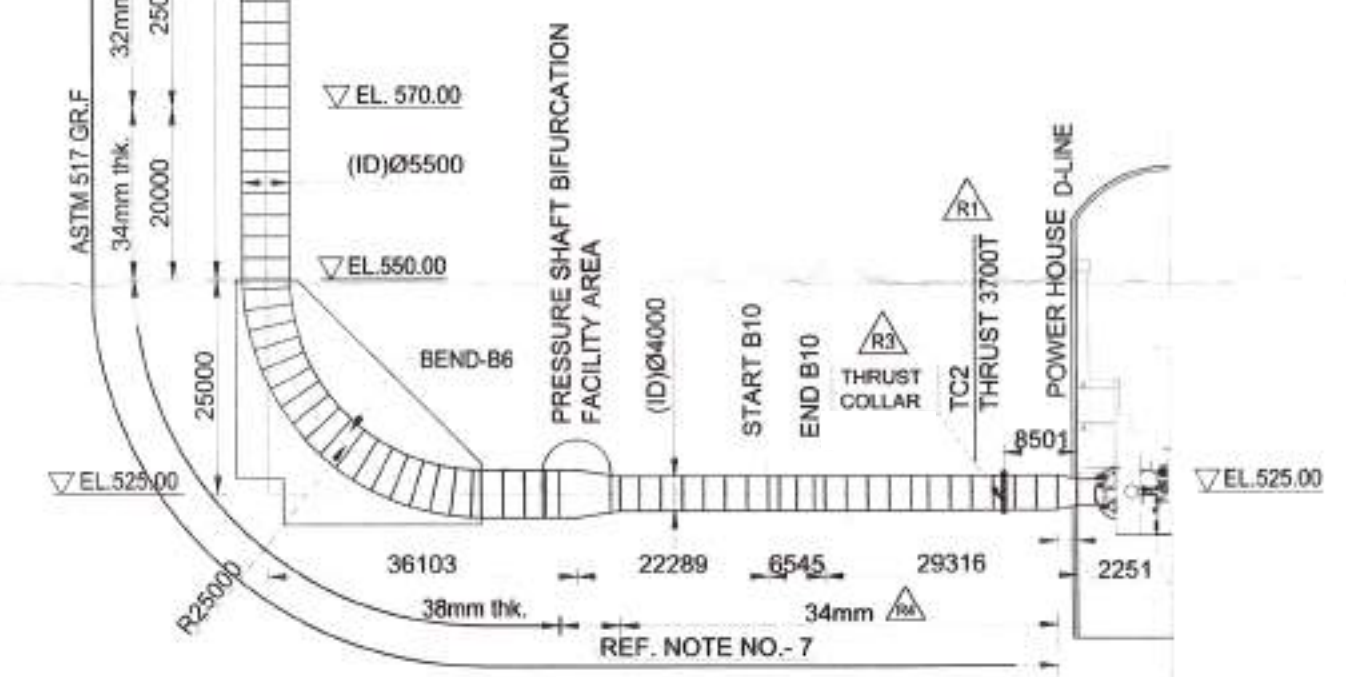
- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
 2. NO DIMENSION IS TO BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.
 3. THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
 DRG. NO. PS-C2-AR3-C01, DATED: 02 AUGUST, 2019
 DRG. NO. PS-C2-AR3-C02, DATED: 02 AUGUST, 2019
 DRG. NO. PS-C2-AR3-C03, DATED: 02 AUGUST, 2019
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HST TABLE

S.No	Thickness	Diameter	Material	Design pressure Mpa	HST test Pressure Mpa
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10	38	5500	ASTM 517 Gr F	3.83	5.745
11	34	4000	ASTM 517 Gr F	3.928	5.892



LONGITUDINAL SECTION OF BIFURCATION TO POWER HOUSE UNIT -3 (PS-2)



LONGITUDINAL SECTION OF SURGE SHAFT TO POWER HOUSE (THROUGH PS-2) UNIT -4

IMPORTANT
 N.B. This approval does not relieve manufacturer of any responsibility for accuracy & correctness of Design, Drawings, Fabrication, Erection, Testing, Commissioning, Satisfactory performance of the equipment on the site & guarantee etc.

IMPORTANT
 N.B. This approval does not relieve manufacturer of any responsibility for accuracy & correctness of Design, Drawings, Fabrication, Erection, Testing, Commissioning, Satisfactory performance of the equipment on the site & guarantee etc.

CHECKED
 Sr. MANAGER

SUBMITTED
 Dy GENERAL MANAGER

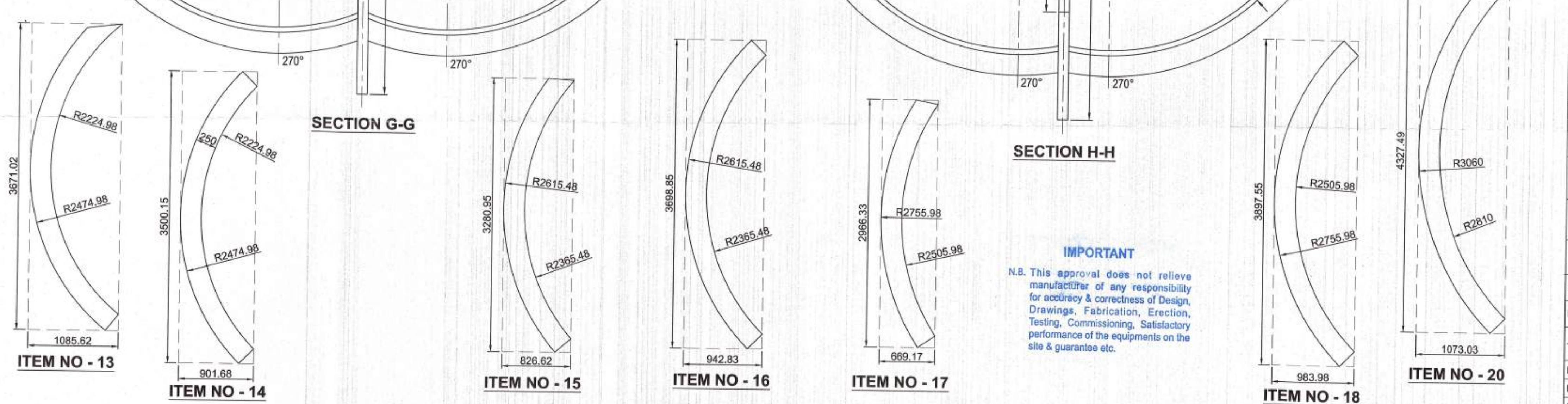
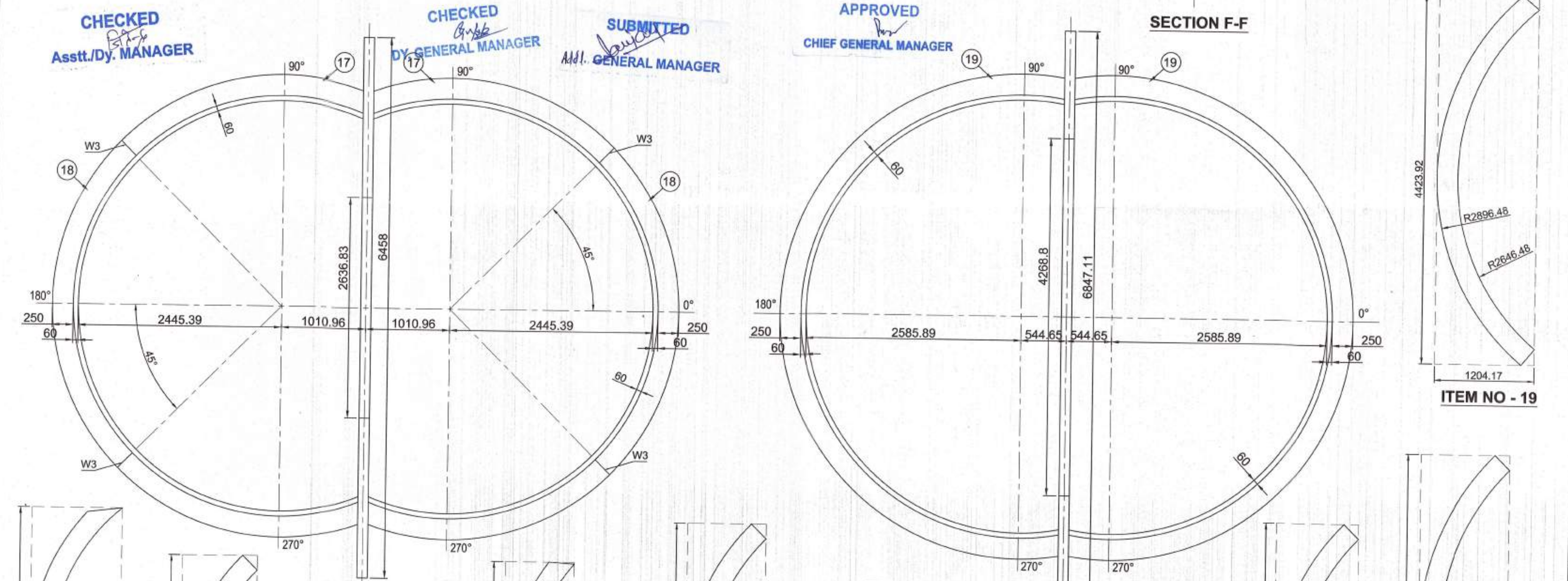
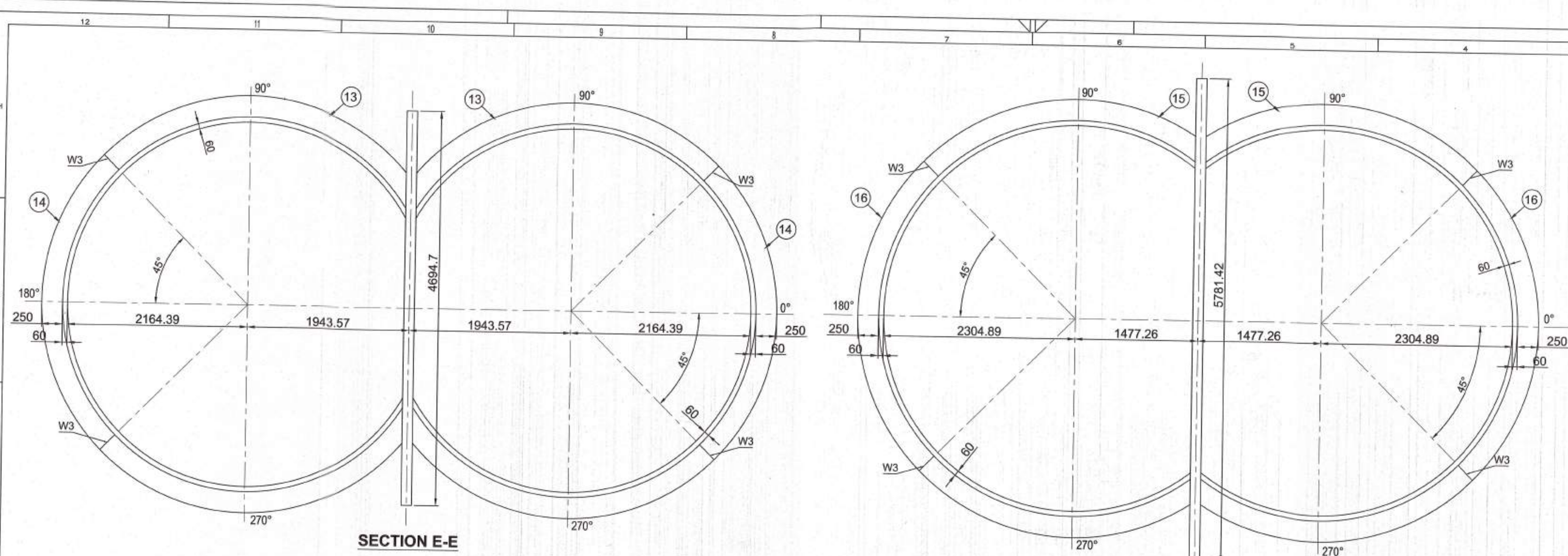
APPROVED
 CHIEF GENERAL MANAGER

REVISION DETAILS	
R4	DRAWING REVISED AS PER SAPDC MAIL DATED 24.06.2020
R3	DRAWING REVISED AS PER SAPDC MAIL DATED 18.02.2020
R2	DRAWING REVISED AS PER SAPDC MAIL DATED 22.12.2019
R1	20.06.19 TC1, TC2, NICHE, ANTI PERCOLATION RINGS INCORPORATED AS PER SAPDC LETTER NO. 2654 DT. 26.05.19 & E MAIL DT 18.06.2019
RO	26.04.2019 1ST SUBMISSION

S.No	Item	Paints or coating material	Total No. of coats	DFT
1	External surface which are embedded in concrete	Coat of cement solution mixed with 5% potassium dichromate.	1	
2	Exposed surface of liner	a) Zinc rich epoxy primer	2	Each coat Min of 50 microns but total not more than 150 micron
		b) Cold applied coal tar epoxy paint	3	450 (3 x 150) micron
3	Interior surface	a) Zinc rich epoxy primer	2	Each coat Min of 50 microns but total not more than 150 micron
		b) Cold applied coal tar epoxy paint	3	450 (3 x 150) micron

(SH. 2 OF 2)

CONSULTANT	SJVN LIMITED		
CLIENT	SAPDC (P.) LIMITED		
PROJECT	ARUN-III H.E PROJECT		
TITLE	PRESSURE SHAFT STEEL LINER - PS -2 & UNIT 3 & 4 GENERAL LAYOUT		
DESIGN BY			
DRAWN BY			
CHECKED BY			
SIZE	A1	SCALE	NTS
DRG NO :	ARUN-III HEP/PSL/1200		REV-4
DATE OF SUB.	01.07.2020		



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
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 - THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
DRG. NO. PS-C2-AR3-C01, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C02, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C03, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C04, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C05, DATED: 02 AUGUST, 2019
 - MARGIN FOR CUTTING ALLOWANCE SHALL BE MADE IN THE DIMENSIONS INDICATED ON THE DRAWING FOR MARKING ON THE PLATE SO AS TO ACHIEVE THE FINAL DIMENSION AFTER CUTTING.
 - FOR BACKFILLING, CONCRETING AND OTHER CIVIL DETAILS REFER CIVIL DRAWINGS.
 - ALL THE PIPE SHELLS, BEND, WYE PIECES, TAPER PIECES, EXPANSION COUPLINGS ETC. SHALL BE GENERAL SUBJECT TO TEST PRESSURE EQUAL TO 150% OF THE DESIGN PRESSURE REDUCING STRESS NOT EXCEEDING 90% OF YIELD STRESS/SHELL AND SHALL BE INDICATED IN SEPARATE FABRICATIONS DRAWINGS.
 - WELDING SHALL BE CARRIED OUT AS PER ASME SECTIONS VIII, IS-2825, IS-9595, AND OTHER RELEVANT CODES. ALL WELDS SHALL BE FULL STRENGTH WELDS.
 - DESIGN OF BIFURCATION PIECES HAS BEEN CARRIED OUT AS PER FEM ANALYSIS.
 - ALL INTERIOR AND EXTERIOR SURFACES (UN-MACHINED) SHALL BE 100% SAND BLASTED.
 - NON-DESTRUCTIVE TEST OF WELDS SHALL BE CARRIED OUT AS PER TECHNICAL SPECIFICATIONS.
A) ALL SHOP LONGITUDINAL JOINTS & CIRCUMFERENTIAL JOINTS SHALL BE 100% RADIOGRAPHY.
B) ALL FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECT TO 100% ULTRASONIC TESTING (ACCESSIBLE FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECT TO 100% RADIOGRAPHY).
 - ELECTRODES TO BE USED SHALL BE AS PER THE MATERIAL SPECIFICATION, APPROVED QAP AND APPROVED WPS.
 - THICKNESS OF FILLED WELD FOR STIFFENER SHALL BE SAME AS THE THICKNESS OF STIFFENER.
 - FOR FIELD WELD PROVISION TO BE CHECKED AT OUTSIDE FOR REPAIR FROM OUTSIDE, IF REQUIRED.
 - MAXIMUM WIDTH OF PLATE CONSIDERED AS 2500MM.
 - PLATES SHALL BE TESTED 100% ULTRASONIC TEST AS PER APPROVED QAP.
 - BEFORE TAKING UP PROFILE CUTTING FOR FABRICATION, PLATE MUST BE MADE DIAGONALLY SQUARE.
 - FABRICATION SHALL BE DONE STRICTLY AS PER TECHNICAL SPECIFICATION.
 - WHILE ROLLING, ENSURE THAT PLATE MARKINGS APPEAR ON THE OUTER CIRCUMFERENCE OF THE SHELL.
 - PRE-HEATING SHALL BE FOLLOWED STRICTLY AS PROPOSED BY THE STEEL PLATE MANUFACTURER.
 - PAINTING SHALL BE DONE AS PER TECHNICAL SPECIFICATION.
 - BIFURCATION SHALL BE FABRICATED WITH STEEL PLATES OF FERRULE AND STIFFENERS CONFORMING TO ASTM-A-517 GR-F, AND FOR YOKE GIRDER AND RING GIRDER STEEL PLATES CONFORMING TO ASTM-A-517 GR-E OR GR-Q SHALL BE USED.
 - THE HYDROSTATIC TESTING OF BOTH THE BIFURCATIONS SHALL BE CARRIED OUT WITH THE HELP OF BULKHEADS AT A PRESSURE OF 150% OF NORMAL DESIGN PRESSURE.

- LEGEND:**
- ID = INTERNAL DIAMETER
 - OD = OUTER DIAMETER
 - PS = PRESSURE SHAFT
 - THK = THICKNESS
 - FE = FERRULE
 - MP = MAKE UP PIECE
 - GH = GROUT HOLE
 - CJ = CIRCUMFERENTIAL JOINT
 - LJ = LONGITUDINAL JOINT

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DY. GENERAL MANAGER

SUBMITTED
ADDL. GENERAL MANAGER

APPROVED
CHIEF GENERAL MANAGER

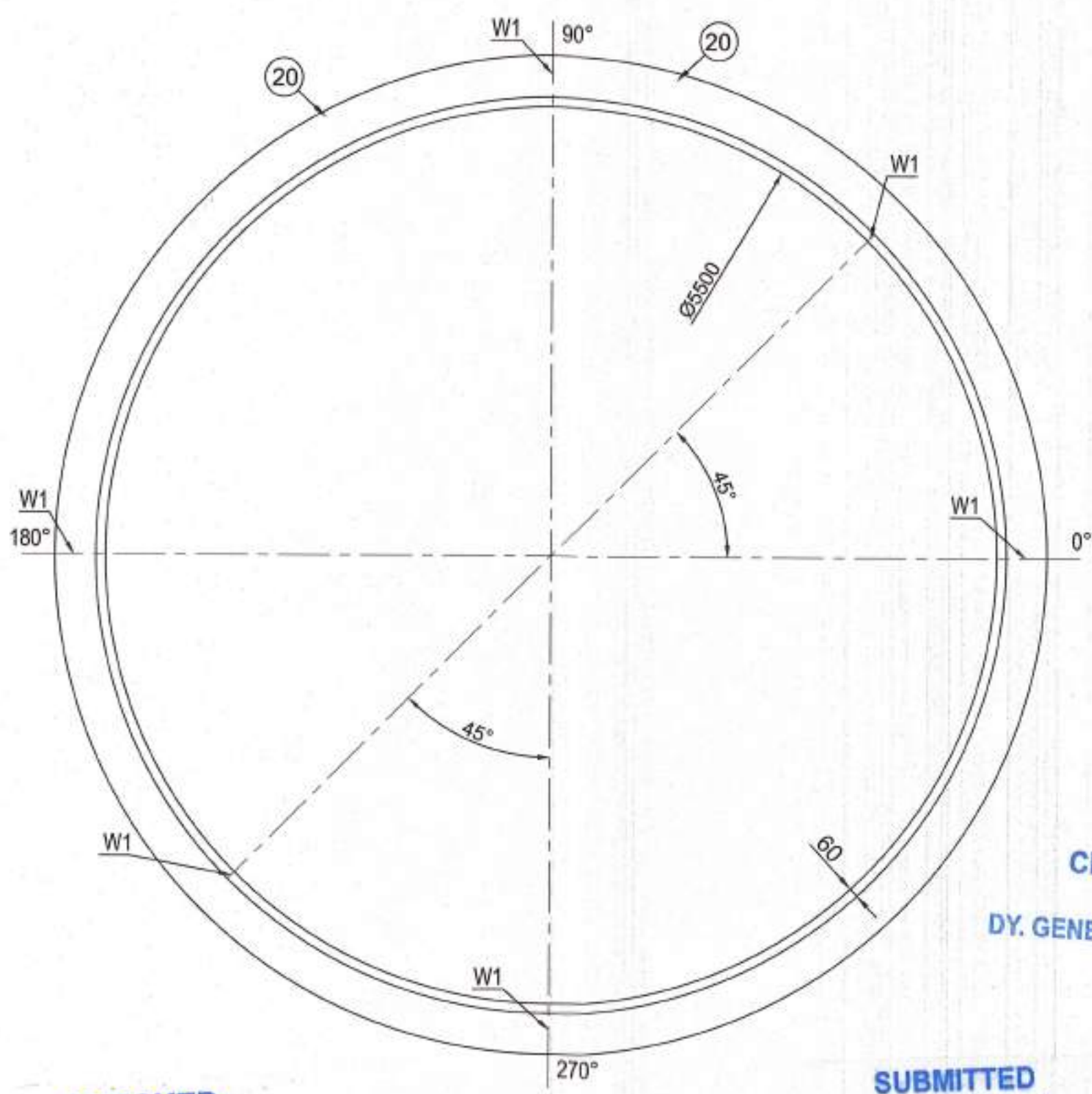
IMPORTANT
N.B. This approval does not relieve manufacturer of any responsibility for accuracy & correctness of Design, Drawings, Fabrication, Erection, Testing, Commissioning, Satisfactory performance of the equipments on the site & guarantee etc.

01 REVISED AS PER SAPDC MAIL DATED 08.04.2022

REVISION DETAILS

SHEET 2 OF 4

CONSULTANT	SJVN LIMITED	
CLIENT	SAPDC (P.) LIMITED	
PROJECT	ARUN-III H.E PROJECT	
TITLE	G.A. & DEVELOPMENT OF BIFURCATION FOR PS-1 & 2 (ID 5500mm TO ID 4000mm)	
DESIGN BY		DATE OF SUB. 24.05.2022
DRAWN BY		
CHECKED BY		
SIZE	SCALE NTS	DRG NO: ARUN-III HEP/PSSL/1218A REV-1

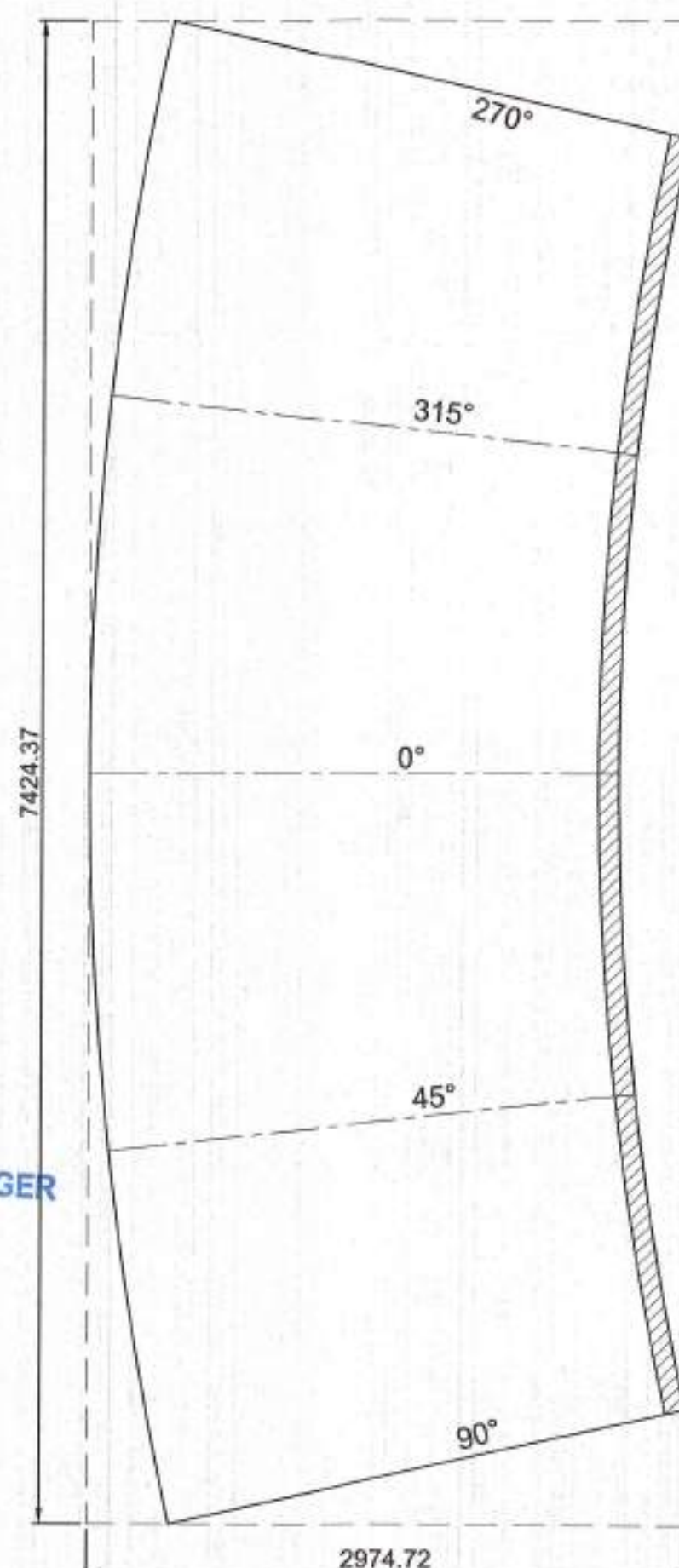


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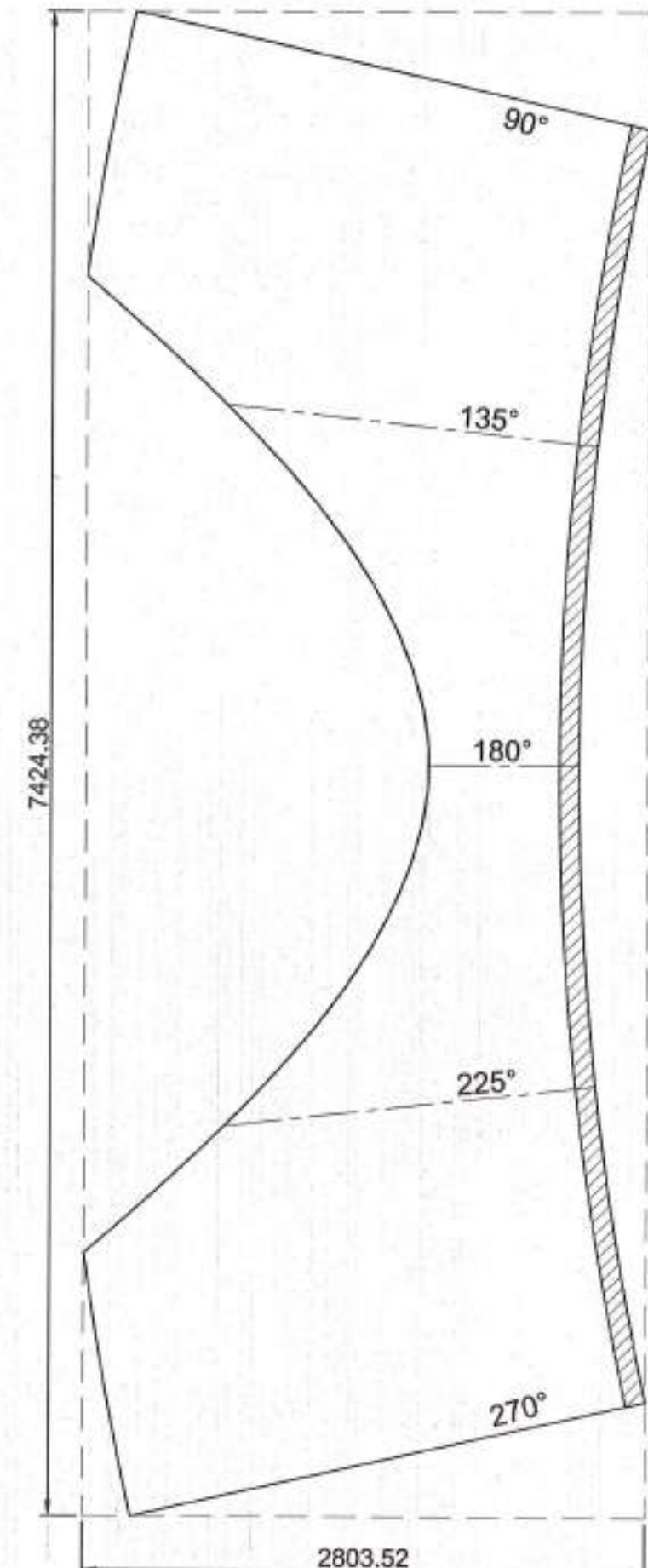
SECTION D-D

SUBMITTED
Addl. GENERAL MANAGER

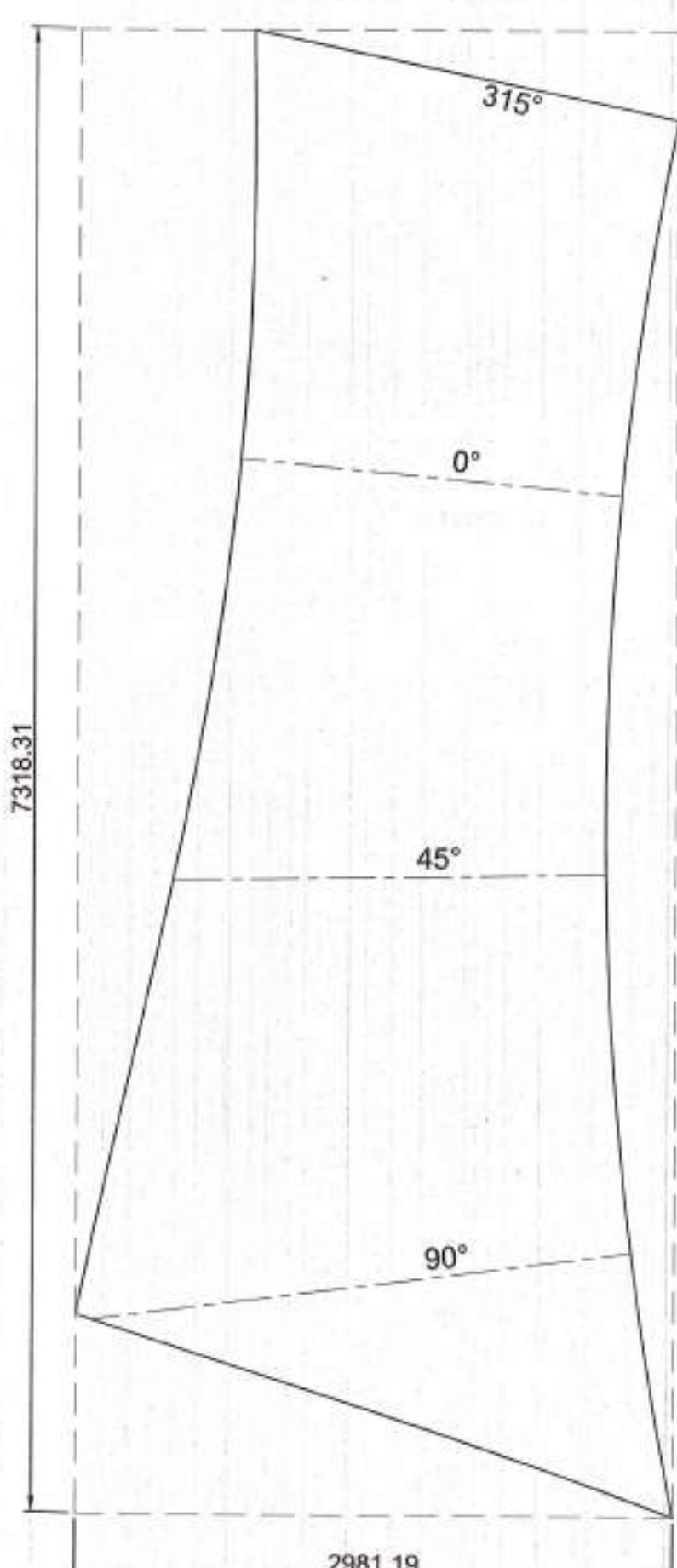
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Dy. GENERAL MANAGER



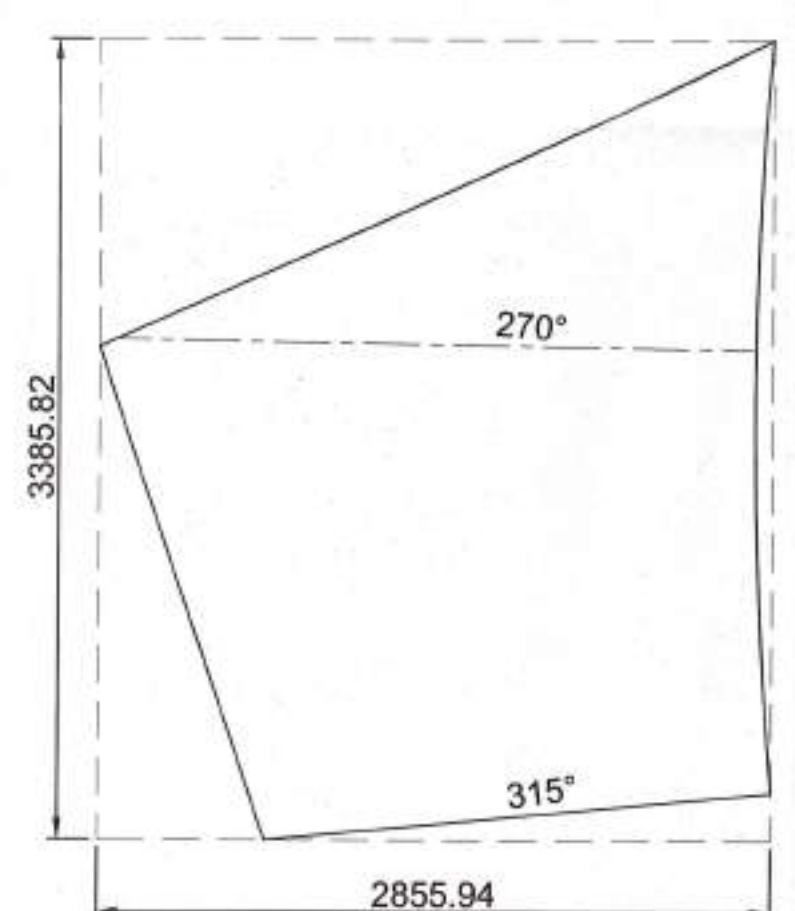
ITEM NO - 01



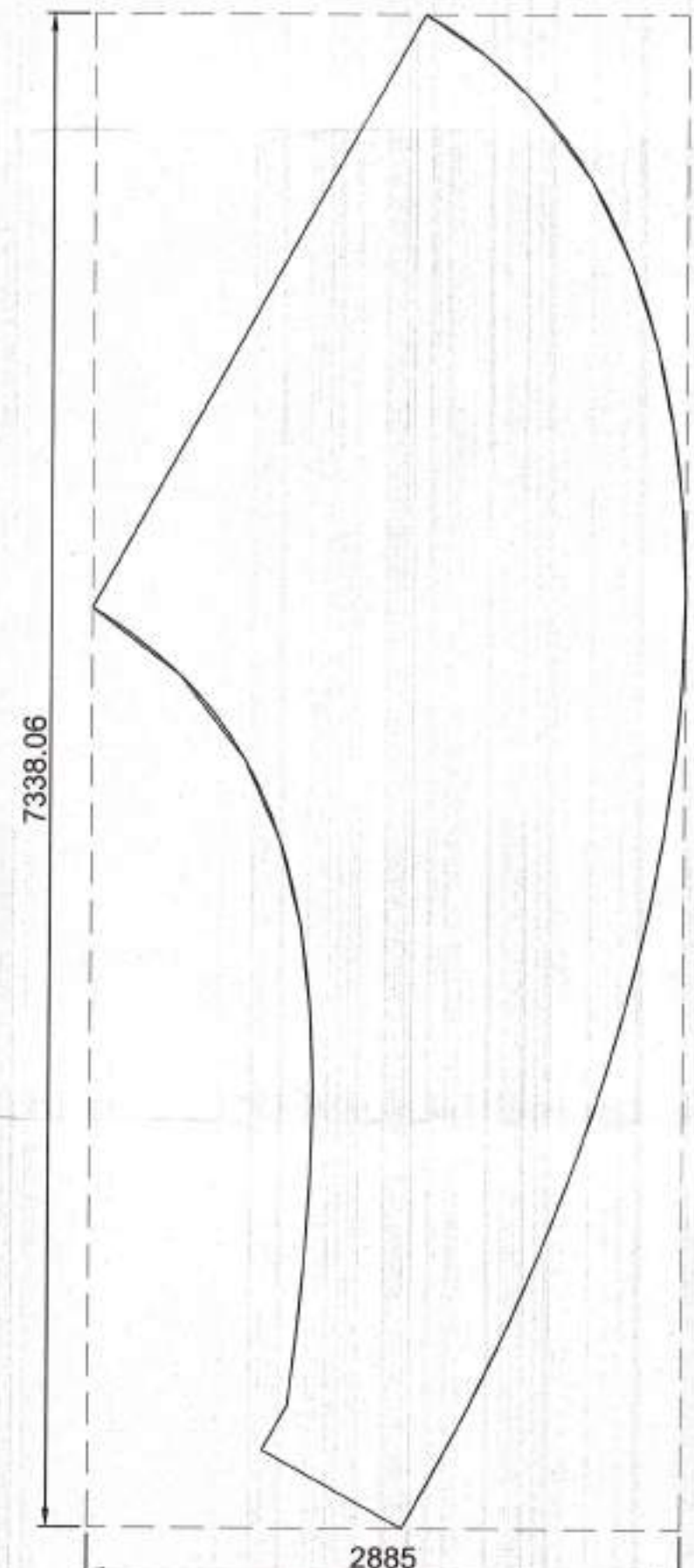
ITEM NO - 02



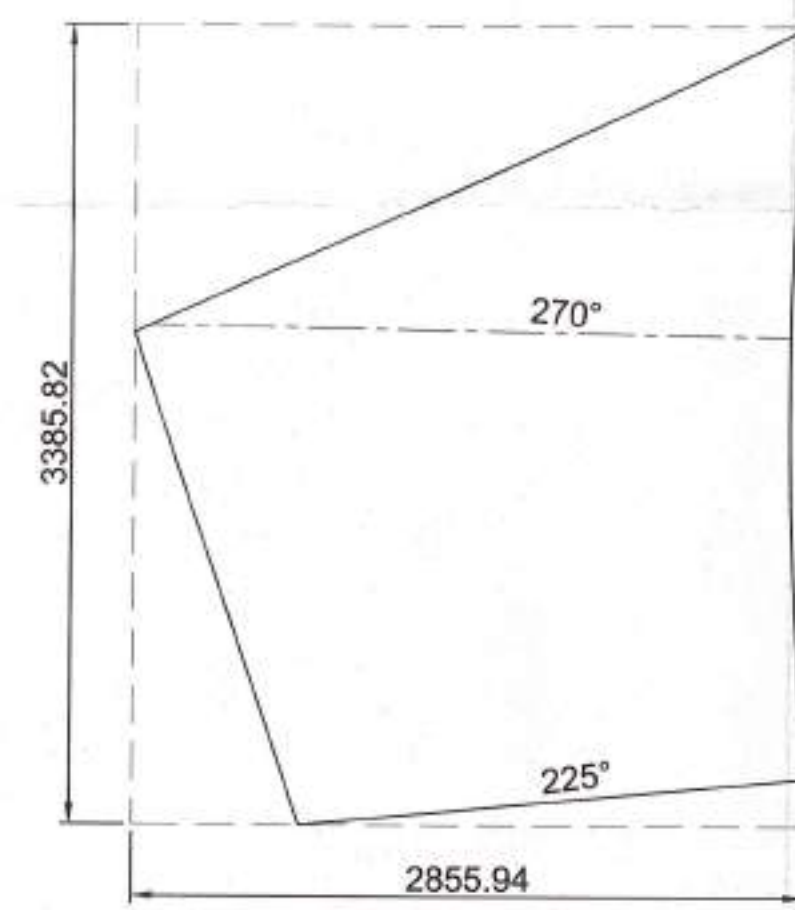
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ITEM NO - 04



ITEM NO - 11

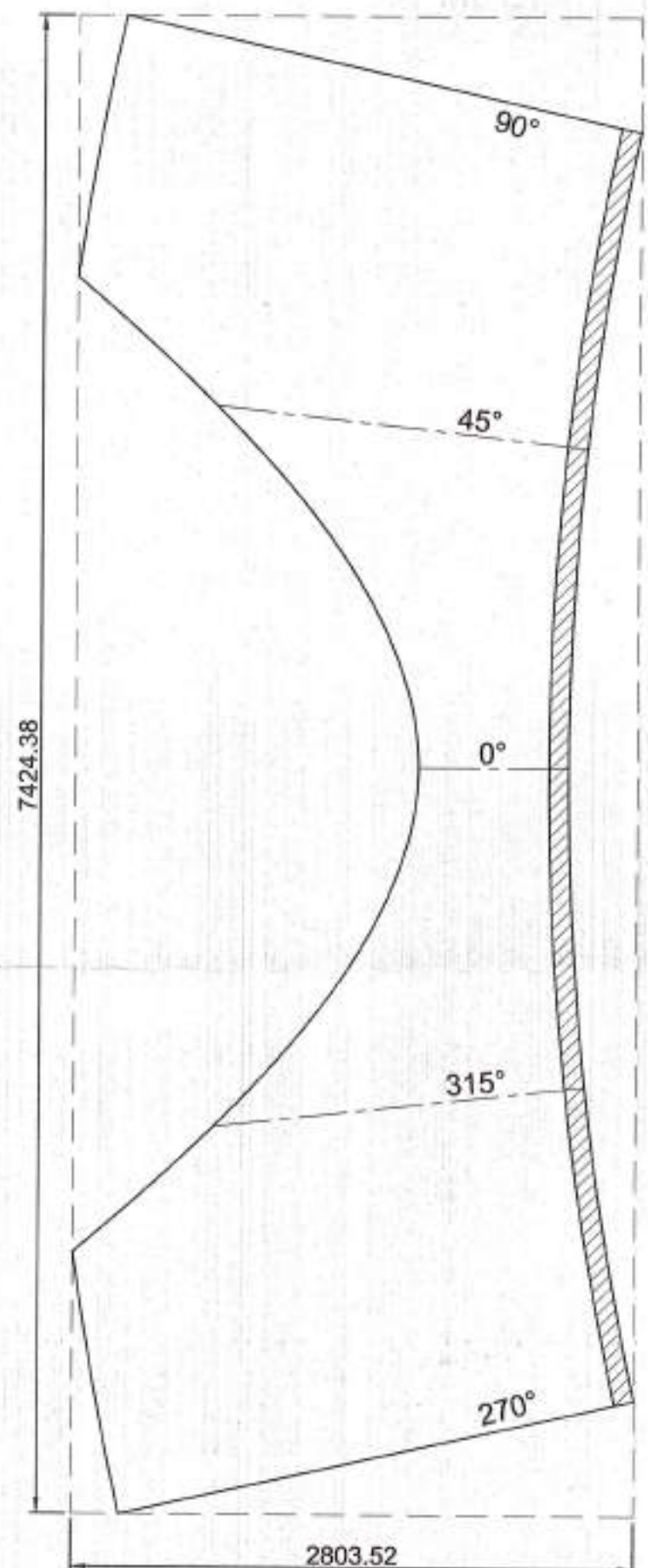


ITEM NO - 08

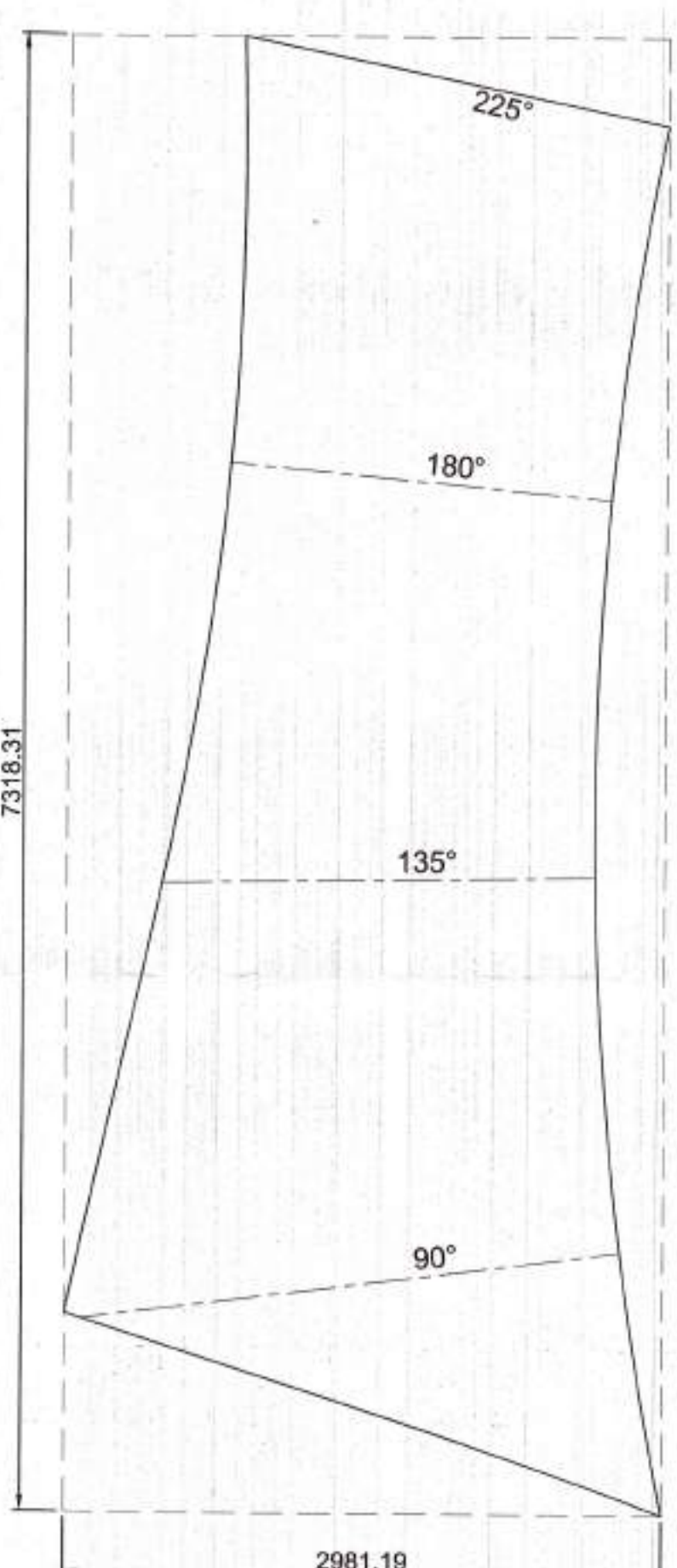
APPROVED
CHIEF GENERAL MANAGER



ITEM NO - 05



ITEM NO - 06



ITEM NO - 07

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
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 - THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
DRG.NO. PS-C2-AR3-C01 , DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C02 , DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C03 , DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C04 , DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C05 , DATED: 02 AUGUST, 2019
 - MARGIN FOR CUTTING ALLOWANCE SHALL BE MADE IN THE DIMENSIONS INDICATED ON THE DRAWING FOR MARKING ON THE PLATE SO AS TO ACHIEVE THE FINAL DIMENSION AFTER CUTTING.
 - FOR BACKFILLING, CONCRETING AND OTHER CIVIL DETAILS REFER CIVIL DRAWINGS.
 - ALL THE PIPE SHELLS, BEND, WYE PIECES, TAPER PIECES, EXPANSION COUPLINGS ETC. SHALL BE GENERAL SUBJECT TO TEST PRESSURE EQUAL TO 150% OF THE DESIGN PRESSURE REDUCING STRESS NOT EXCEEDING 90% OF YIELD STRESS; SHELL AND SHALL BE INDICATED IN SEPARATE FABRICATIONS DRAWINGS.
 - WELDING SHALL BE CARRIED OUT AS PER ASME SECTIONS VIII, IS:2825, IS:9595, AND OTHER RELEVANT CODES. ALL WELDS SHALL BE FULL STRENGTH WELDS.
 - DESIGN OF BIFURCATION PIECES HAS BEEN CARRIED OUT AS PER FEM ANALYSIS.
 - ALL INTERIOR AND EXTERIOR SURFACES (UN-MACHINED) SHALL BE 100% SAND BLASTED.
 - NON-DESTRUCTIVE TEST OF WELDS SHALL BE CARRIED OUT AS PER TECHNICAL SPECIFICATIONS.
A) ALL SHOP LONGITUDINAL JOINTS & CIRCUMFERENTIAL JOINTS SHALL BE 100% RADIOGRAPHY.
B) ALL FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECT TO 100% ULTRASONIC TESTING (ACCESSIBLE FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECT TO 100% RADIOGRAPHY).
 - ELECTRODES TO BE USED SHALL BE AS PER THE MATERIAL SPECIFICATION, APPROVED QAP AND APPROVED WPS.
 - THICKNESS OF FILLED WELD FOR STIFFENER SHALL BE SAME AS THE THICKNESS OF STIFFENER. **FILLET**
 - FOR FIELD WELD PROVISION TO BE CHECKED AT OUTSIDE FOR REPAIR FROM OUTSIDE, IF REQUIRED.
 - MAXIMUM WIDTH OF PLATE CONSIDERED AS 2500MM.
 - PLATES SHALL BE TESTED 100% ULTRASONIC TEST AS PER APPROVED QAP.
 - BEFORE TAKING UP PROFILE CUTTING FOR FABRICATION, PLATE MUST BE MADE DIAGONALLY SQUARE.
 - FABRICATION SHALL BE DONE STRICTLY AS PER TECHNICAL SPECIFICATION.
 - WHILE ROLLING, ENSURE THAT PLATE MARKINGS APPEAR ON THE OUTER CIRCUMFERENCE OF THE SHELL.
 - PRE-HEATING SHALL BE FOLLOWED STRICTLY AS PROPOSED BY THE STEEL PLATE MANUFACTURER.
 - PAINTING SHALL BE DONE AS PER TECHNICAL SPECIFICATION.
 - BIFURCATION SHALL BE FABRICATED WITH STEEL PLATES OF FERRULE AND STIFFENERS CONFORMING TO ASTM-A-517 GR-F, AND FOR YOKE GIRDER AND RING GIRDER STEEL PLATES CONFORMING TO ASTM-A-517 GR-E OR GR-Q SHALL BE USED.
 - THE HYDROSTATIC TESTING OF BOTH THE BIFURCATIONS SHALL BE CARRIED OUT WITH THE HELP OF BULKHEADS AT A PRESSURE OF 150% OF NORMAL DESIGN PRESSURE.

- ID = INTERNAL DIAMETER
- OD = OUTER DIAMETER
- PS = PRESSURE SHAFT
- THK = THICKNESS
- FE = FERRULE
- MP = MAKE UP PIECE
- GH = GROUT HOLE
- CJ = CIRCUMFERENTIAL JOINT
- LJ = LONGITUDINAL JOINT

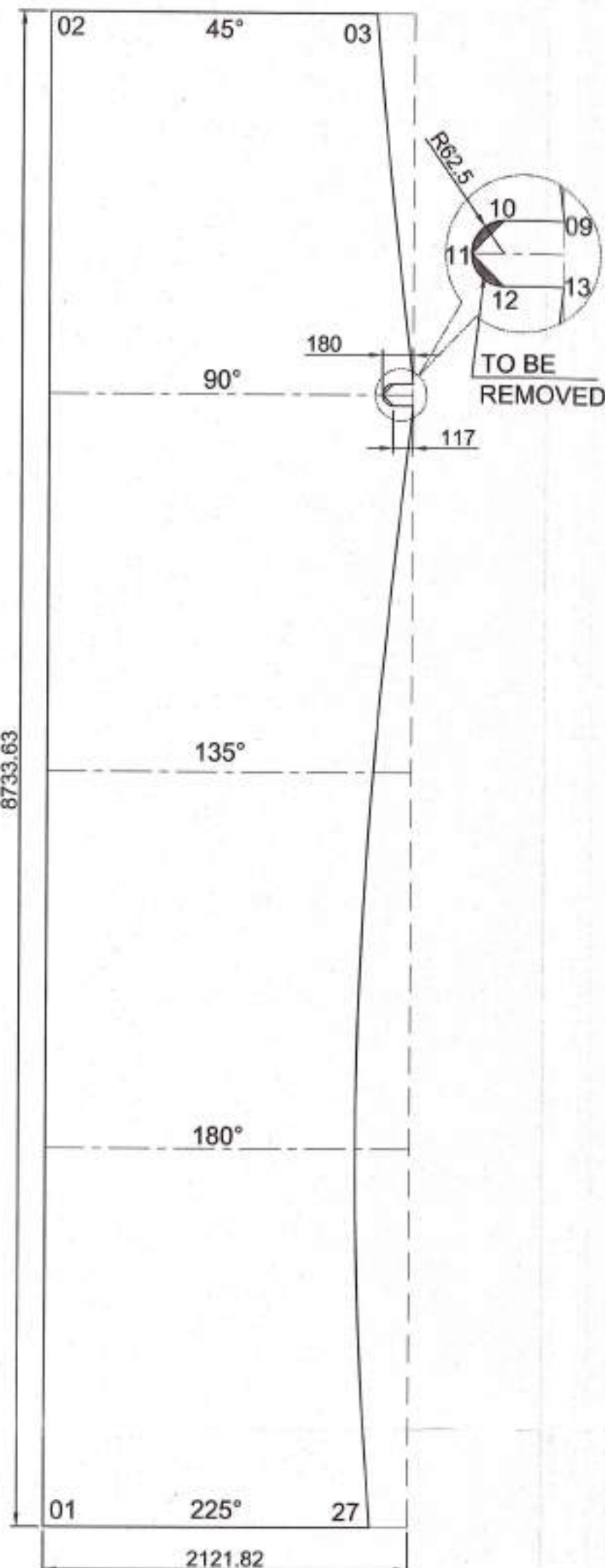
IMPORTANT
N.B. This approval does not relieve manufacturer of any responsibility for accuracy & correctness of Design, Drawings, Fabrication, Erection, Testing, Commissioning, Satisfactory performance of the equipments on the site & guarantee etc.

01 REVISED AS PER SAPDC MAIL DATED 08.04.2022

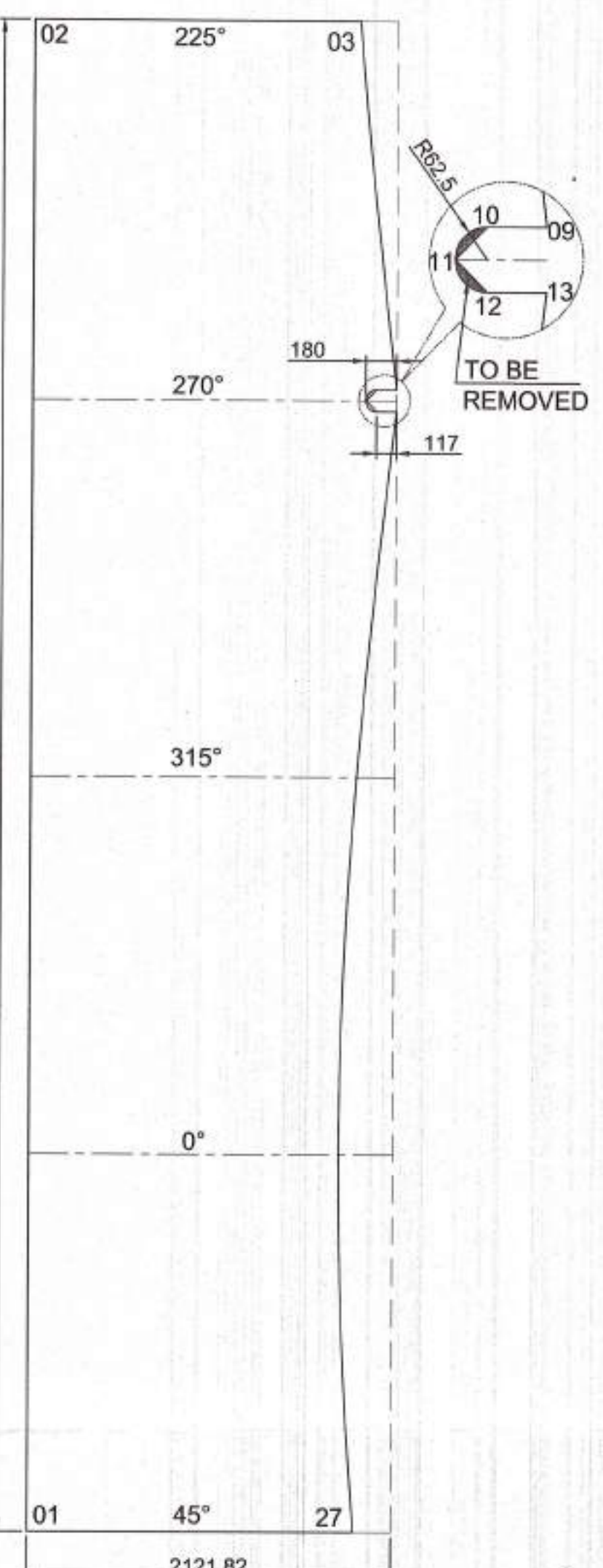
REVISION DETAILS

SHEET 3 OF 4

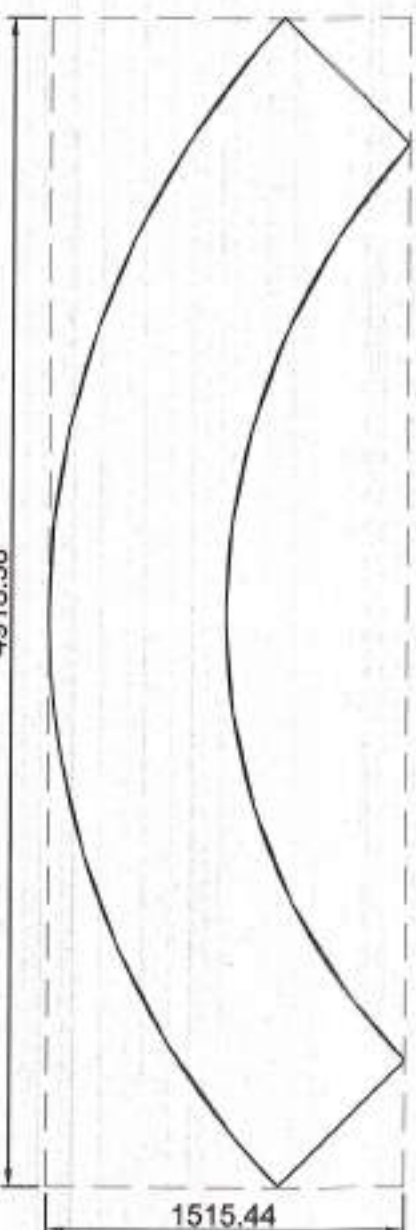
CONSULTANT	SJVN LIMITED	
CLIENT	SAPDC (P.) LIMITED	
PROJECT	ARUN-III H.E PROJECT	
TITLE	G.A. & DEVELOPMENT OF BIFURCATION FOR PS-1 & 2 (ID 5500mm TO ID 4000mm)	
DESIGN BY		DATE OF SUB. 24.05.2022
DRAWN BY		
CHECKED BY		SUBMITTED BY:
SIZE	SCALE NTS	DRG NO : ARUN-III HEP/PSSL/1218A REV-1



ITEM NO - 09



ITEM NO - 10



ITEM NO - 12

BILL OF MATERIAL LIST

Item No.	Description	Thkin mm	Width in mm	Length in mm	Area (mm ²)	Qty.	Total Weight in Kgs.	Mat.	
1	CONICAL BRANCH	60	2974.7	7424.4	22085421.9	1	10402.2	ASTM A-517 GR.F	
2	CONICAL BRANCH	60	2803.5	7424.4	20814369.8	1	9803.6		
3	CONICAL BRANCH	60	2981.2	7318.3	21817272.6	1	10275.9		
4	CONICAL BRANCH	60	2855.9	3385.8	9669698.8	1	4554.4		
5	CONICAL BRANCH	60	2974.7	7424.4	22085421.9	1	10402.2		
6	CONICAL BRANCH	60	2803.5	7424.4	20814369.8	1	9803.6		
7	CONICAL BRANCH	60	2981.2	7318.3	21817272.6	1	10275.9		
8	CONICAL BRANCH	60	2855.9	3385.8	9669698.8	1	4554.4		
9	STRAIGHT FERRULE	60	2121.8	8733	18529854.1	1	8727.6		
10	STRAIGHT FERRULE	60	2121.8	8733	18529854.1	1	8727.6		
11	YOKE PLATE	125	2885.0	7338.0	21170130.0	2	41546.4	ASTM A-517 GR.F/GR.Q	
12	RING GIRDER	125	1515.4	4918	7452933.9	4	29252.8		
13	RING STIFFENER	45	1085.6	3671	3985311.0	4	5631.2	ASTM A-517 GR.F	
14	RING STIFFENER	45	901.7	3500	3155880.0	2	2229.6		
15	RING STIFFENER	45	826.6	3280	2711313.6	4	3831.1		
16	RING STIFFENER	45	942.8	3698	3486585.3	2	2463.3		
17	RING STIFFENER	45	669.2	2966	1984758.2	4	2804.5		
18	RING STIFFENER	45	984.0	3897	3834570.1	2	2709.1		
19	RING STIFFENER	45	1204.2	4423	5326043.9	4	7525.7		
20	RING STIFFENER	45	1073.0	4327	4643000.8	4	6560.6		
Total Weight							192081.68		

BILL OF MATERIAL SHOWN FOR ONE BIFURCATION.
TOTAL No. OF REQUIRED BIFURCATION - 2 Nos.

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
 - NO DIMENSION IS TO BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.
 - THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
DRG. NO. PS-C2-AR3-C01, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C02, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C03, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C04, DATED: 02 AUGUST, 2019
DRG. NO. PS-C2-AR3-C05, DATED: 02 AUGUST, 2019
 - MARGIN FOR CUTTING ALLOWANCE SHALL BE MADE IN THE DIMENSIONS INDICATED ON THE DRAWING FOR MARKING ON THE PLATE SO AS TO ACHIEVE THE FINAL DIMENSION AFTER CUTTING.
 - FOR BACKFILLING, CONCRETING AND OTHER CIVIL DETAILS REFER CIVIL DRAWINGS.
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 - WELDING SHALL BE CARRIED OUT AS PER ASME SECTIONS VIII, IS:2825, IS:9595, AND OTHER RELEVANT CODES. ALL WELDS SHALL BE FULL STRENGTH WELDS.
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 - FABRICATION SHALL BE DONE STRICTLY AS PER TECHNICAL SPECIFICATION.
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GH = GROUT HOLE
CJ = CIRCUMFERENTIAL JOINT
LJ = LONGITUDINAL JOINT

COORDINATES FOR ITEM No. : 1 & 5

Sl.No	X	Y
01.	407.3	0.0
02.	323.4	400.0
03.	249.5	800.0
04.	185.3	1200.0
05.	130.8	1600.0
06.	85.8	2000.0
07.	50.4	2400.0
08.	24.3	2800.0
09.	7.7	3200.0
10.	0.4	3600.0
11.	2.4	4000.0
12.	13.8	4400.0
13.	34.6	4800.0
14.	64.8	5200.0
15.	104.4	5600.0
16.	153.5	6000.0
17.	212.3	6400.0
18.	280.7	6800.0
19.	359.0	7200.0
20.	407.3	7424.4
21.	2974.7	6854.1
22.	2881.4	6400.0
23.	2811.7	6000.0
24.	2753.5	5600.0
25.	2706.6	5200.0
26.	2670.9	4800.0
27.	2646.3	4400.0
28.	2632.9	4000.0
29.	2630.4	3600.0
30.	2639.1	3200.0
31.	2658.7	2800.0
32.	2689.5	2400.0
33.	2731.5	2000.0
34.	2784.8	1600.0
35.	2849.4	1200.0
36.	2925.6	800.0
37.	2974.7	570.2

COORDINATES FOR ITEM No. : 2 & 6

Sl.No	X	Y
01.	236.1	0.0
02.	152.2	400.0
03.	78.3	800.0
04.	14.1	1200.0
05.	0.0	1297.0
06.	120.5	1400.0
07.	347.7	1600.0
08.	564.0	1800.0
09.	768.3	2000.0
10.	959.3	2200.0
11.	1133.4	2400.0
12.	1286.6	2600.0
13.	1417.7	2800.0
14.	1526.3	3000.0
15.	1611.5	3200.0
16.	1671.5	3400.0
17.	1703.9	3600.0
18.	1705.9	3800.0
19.	1676.9	4000.0
20.	1620.2	4200.0
21.	1538.0	4400.0
22.	1432.1	4600.0
23.	1303.7	4800.0
24.	1153.3	5000.0
25.	981.6	5200.0
26.	792.3	5400.0
27.	589.6	5600.0
28.	374.7	5800.0
29.	148.7	6000.0
30.	0.0	6127.3
31.	41.1	6400.0
32.	109.5	6800.0
33.	187.8	7200.0
34.	236.1	7424.4
35.	2803.5	6854.1
36.	2710.3	6400.0
37.	2640.5	6000.0
38.	2582.3	5600.0
39.	2535.4	5200.0
40.	2499.7	4800.0
41.	2475.1	4400.0
42.	2461.7	4000.0
43.	2459.2	3600.0
44.	2467.9	3200.0
45.	2487.5	2800.0
46.	2518.3	2400.0
47.	2560.3	2000.0
48.	2613.6	1600.0
49.	2678.2	1200.0
50.	2754.4	800.0
51.	2803.5	570.2

COORDINATES FOR ITEM No. : 3 & 7

Sl.No	X	Y
01.	0.0	985.4
02.	87.2	1400.0
03.	176.2	1800.0
04.	267.4	2200.0
05.	358.5	2600.0
06.	447.2	3000.0
07.	531.2	3400.0
08.	608.6	3800.0
09.	677.6	4200.0
10.	736.8	4600.0
11.	785.7	5000.0
12.	823.4	5400.0
13.	850.0	5800.0
14.	866.4	6200.0
15.	873.4	6600.0
16.	872.1	7000.0
17.	866.5	7318.3
18.	2981.2	6884.3
19.	2889.0	6400.0
20.	2823.7	6000.0
21.	2768.1	5600.0
22.	2722.1	5200.0
23.	2685.5	4800.0
24.	2658.4	4400.0
25.	2640.7	4000.0
26.	2632.3	3600.0
27.	2633.3	3200.0
28.	2643.7	2800.0
29.	2663.4	2400.0
30.	2692.4	2000.0
31.	2731.0	1600.0
32.	2779.1	1200.0
33.	2836.7	800.0
34.	2904.0	400.0
35.	2981.2	0.0
36.	2425.4	200.0
37.	1832.3	400.0
38.	1215.0	600.0
39.	585.3	800.0
40.	0.0	985.4

COORDINATES FOR ITEM No. : 4 & 8

Sl.No	X	Y
01.	706.5	0.0
02.	572.0	400.0
03.	434.0	800.0
04.	295.3	1200.0
05.	158.4	1600.0
06.	26.2	2000.0
07.	0.0	2081.2
08.	268.8	2200.0
09.	721.6	2400.0
10.	1172.9	2600.0
11.	1619.0	2800.0
12.	2055.9	3000.0
13.	2855.9	3385.8
14.	2824.3	3000.0
15.	2800.7	2600.0
16.	2786.6	2200.0
17.	2781.7	1800.0
18.	2786.2	1400.0
19.	2800.1	1000.0
20.	2823.4	600.0
21.	2855.9	200.8

COORDINATES FOR ITEM No. : 9 & 10

Sl.No	X	Y
01.	0.0	0.0
02.	0.0	8733.6
03.	1900.6	8733.6
04.	1929.6	8400.0
05.	1968.1	8000.0
06.	2010.0	7600.0
07.	2054.3	7200.0
08.	2077.1	7000.0
09.	2121.8	6612.7
10.	2004.5	6612.7
11.	1942.0	6550.2
12.	2004.5	6487.7
13.	2121.8	6487.7
14.	2111.7	6400.0
15.	2088.5	6200.0
16.	2065.6	6000.0
17.	2043.0	5800.0
18.	1999.2	5400.0
19.	1938.9	4800.0
20.	1887.4	4200.0
21.	1847.1	3600.0
22.	1819.9	3000.0
23.	1807.0	2400.0
24.	1809.1	1800.0
25.	1826.0	1200.0
26.	1857.0	600.0
27.	1900.6	0.0

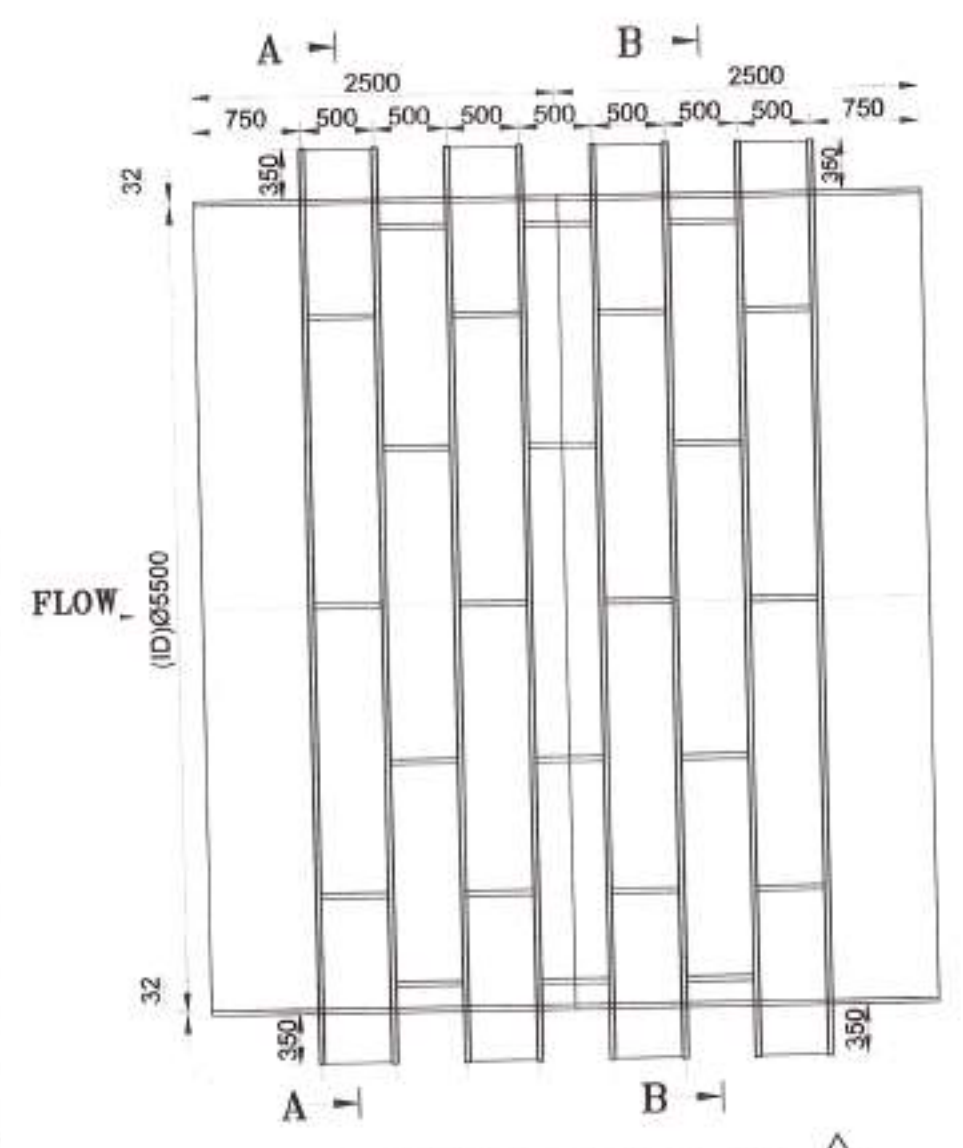
COORDINATES FOR ITEM No. : 11

Sl.No	X	Y
01.	848.8	378.3
02.	970.2	596.9
03.	1011.0	931.1
04.	1049.9	1331.1
05.	1075.5	1731.1
06.	1083.5	2131.1
07.	1067.5	2531.1
08.	1018.2	2931.1
09.	918.8	3331.1
10.	742.5	3730.8
11.	429.1	4130.3
12.	0.0	4453.3
13.	1602.6	7338.1
14.	1905.4	7131.1
15.	2115.7	6931.1
16.	2410.5	6531.1
17.	2605.9	6131.1
18.	2737.3	5731.1
19.	2821.6	5331.1
20.	2868.6	4931.1
21.	2885.0	4531.1
22.	2872.8	4131.1
23.	2836.9	3731.1
24.	2778.8	3331.1
25.	2699.8	2931.1
26.	2600.9	2531.1
27.	2482.7	2131.1
28.	2345.4	1731.1
29.	2189.2	1331.1
30.	2013.7	931.1
31.	1818.3	531.1
32.	1529.8	0.0

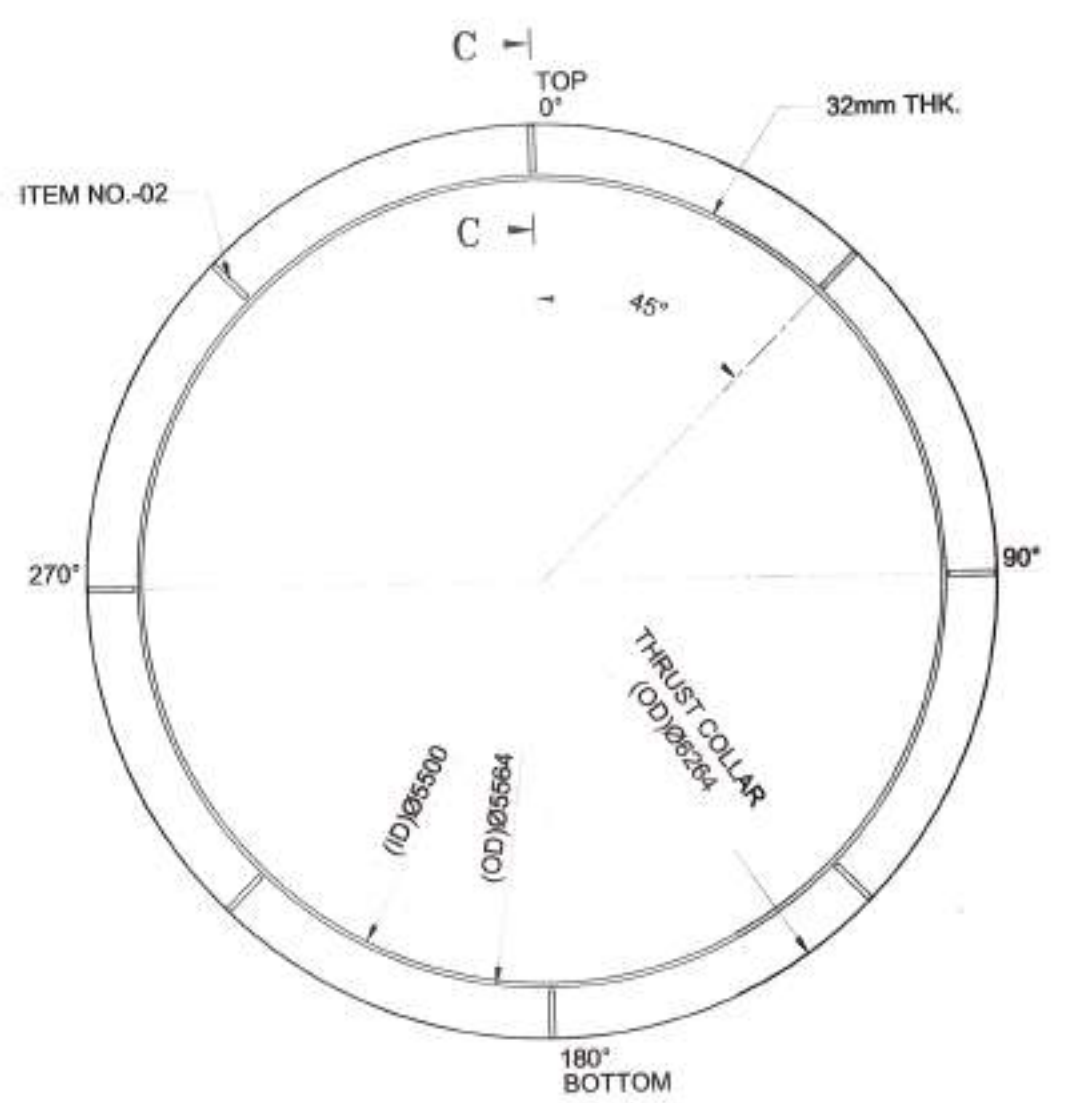
COORDINATES FOR ITEM No. : 12

Sl.No	X	Y
01.	982.9	5.0
02.	804.3	200.0
03.	513.4	600.0
04.	301.1	1000.0
05.	151.2	1400.0
06.	54.8	1800.0
07.	24.9	2000.0
08.	6.7	2200.0
09.	0.0	2400.0
10.	20.0	2800.0
11.	85.3	3200.0
12.	197.8	3600.0
13.	361.6	4000.0
14.	584.1	4400.0
15.	878.1	4800.0
16.	986.6	4923.4
17.	1515.4	4390.1
18.	1218.5	4000.0
19.	1002.9	3600.0
20.	858.3	3200.0
21.	775.3	2800.0
22.	749.9	2400.0
23.	781.7	2000.0
24.	874.4	1600.0
25.	1036.2	1200.0
26.	1284.5	800.0
27.	151	

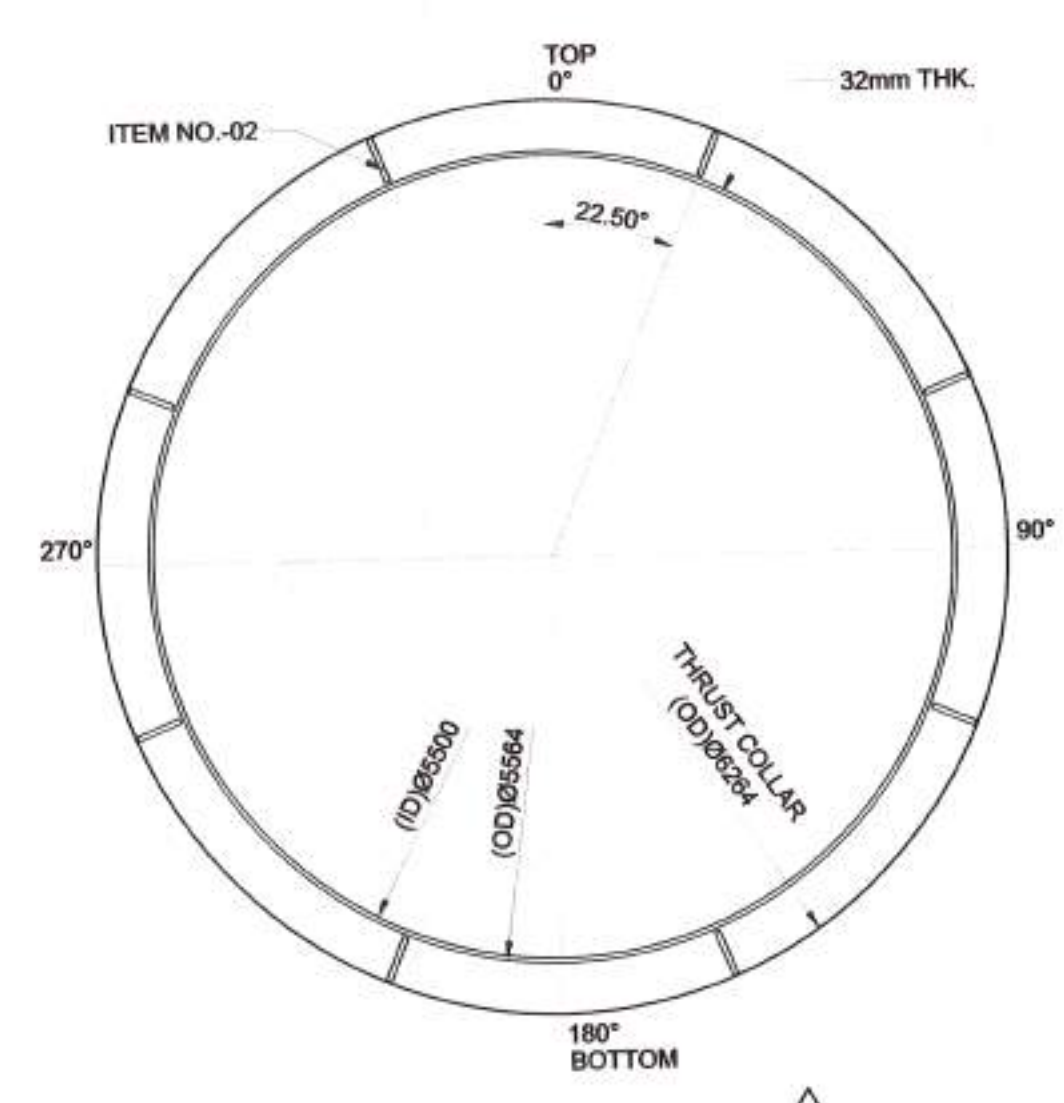
2Nos. THRUST COLLAR TOTAL WEIGHT IN Kgs.	34102.15	11386.77						
1No. THRUST COLLAR TOTAL WEIGHT IN Kgs.	17051.23	20693.39						
2	464X 320 X 36-THK.	56	2349.79	2500 X 2620 X 36-THK.	1	1851.03	ASTM 537	THRUST COLLAR
1	Ø5564 X Ø6264 X 36-THK.	8	14701.44	2500 X 8890 X 36-THK.	3	18842.36	CL-II	
Item No.	Size of Item	Qty.	Erected Weight In Kgs.	Size of plate Used	Qty.	Weight In Kgs.	Material	Ferrule No.



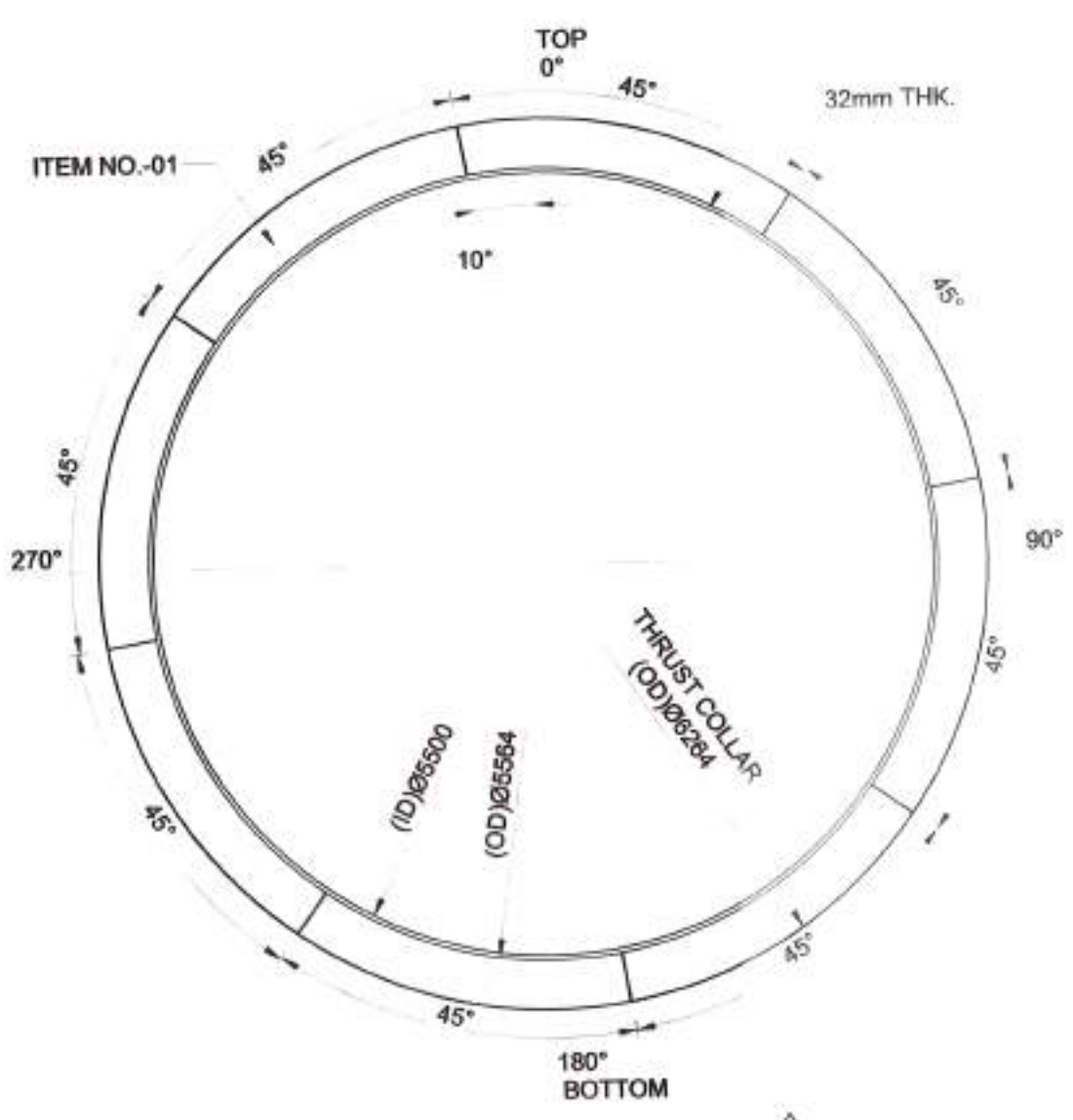
CONNECTING PIECE OF THRUST COLLAR



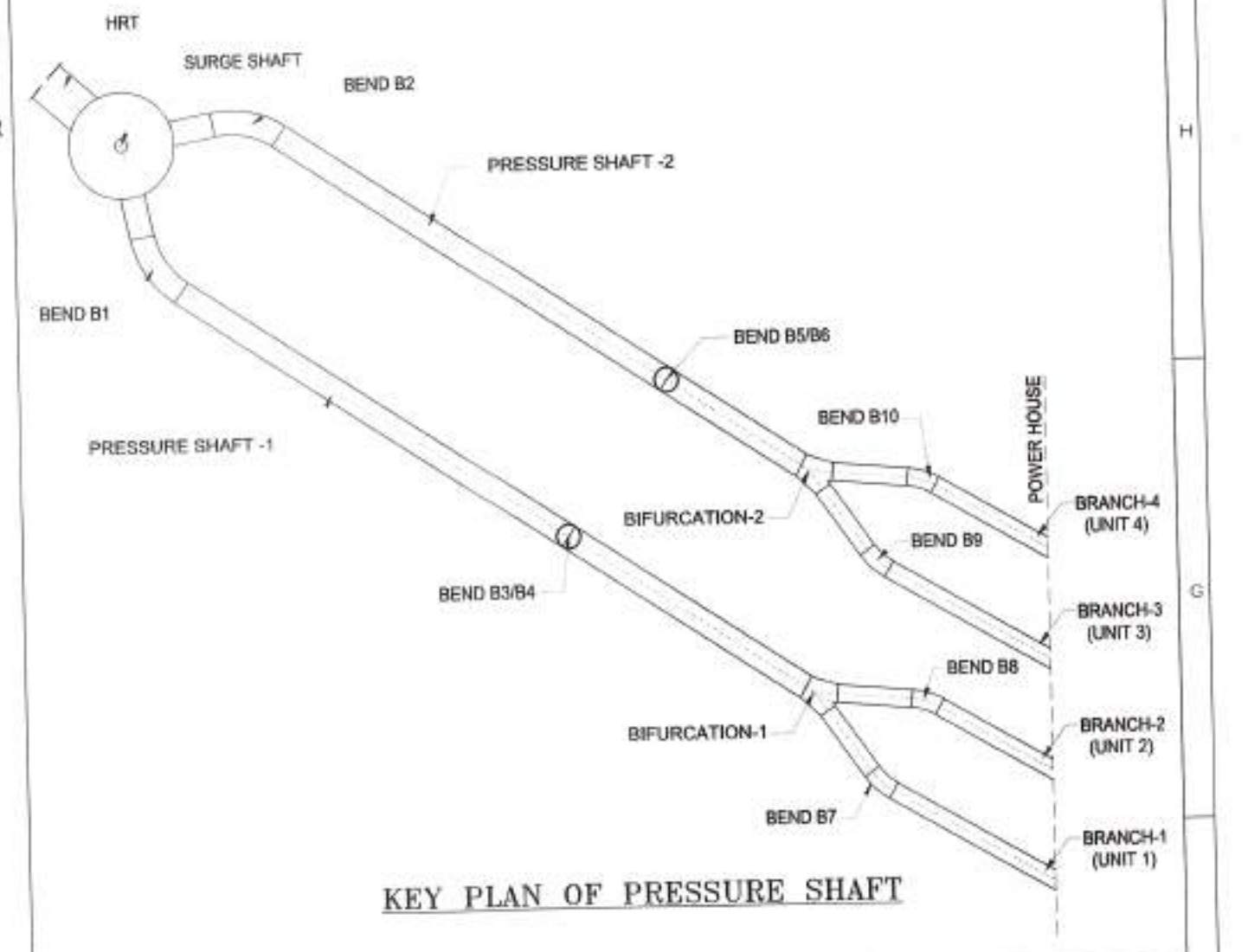
SECTION-AA



SECTION-BB



THRUST COLLAR



KEY PLAN OF PRESSURE SHAFT

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
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 - THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
 - DRG.NO. PS-C2-AR3-C01, DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C02, DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C03, DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C04, DATED: 02 AUGUST, 2019
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 - WELDING SHALL BE CARRIED OUT AS PER ASME SECTIONS VIII, IS-2825, IS-9595, AND OTHER RELEVANT CODES. ALL WELDS SHALL BE FULL STRENGTH WELDS.
 - MATERIAL OF PENSTOCK HAS BEEN CONSIDERED AS ASTM 537 CL II UPTO EL. 645 & REST ALL ASTM 517 GR.F.
 - DESIGN OF PENSTOCK HAS BEEN CARRIED OUT AS PER IS 11639 PART(I),(II),(III) & ASCE MANUAL NO. 79 (2012)
 - ALL INTERIOR AND EXTERIOR SURFACES (UN-MACHINED) SHALL BE 100% SAND BLASTED.
 - NON-DESTRUCTIVE TEST OF WELDS SHALL BE CARRIED OUT AS PER TECHNICAL SPECIFICATIONS.
 - ALL SHOP LONGITUDINAL JOINTS & CIRCUMFERENTIAL JOINTS SHALL BE 100% RADIOGRAPHY.
 - ALL FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECTED TO 100% ULTRASONIC TESTING (ACCESSIBLE FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECTED TO 100% RADIOGRAPHY).
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 - FOR FIELD WELD PROVISION TO BE CHECKED AT OUTSIDE FOR REPAIR FROM OUTSIDE, IF REQUIRED.

- LEGEND:**
- ID = INTERNAL DIAMETER
 - OD = OUTER DIAMETER
 - PS = PRESSURE SHAFT
 - THK = THICKNESS
 - FE = FERRULE
 - MP = MAKE UP PIECE
 - G.H. = GROUT HOLE
 - C.J. = CIRCUMFERENTIAL JOINT
 - L.J. = LONGITUDINAL JOINT

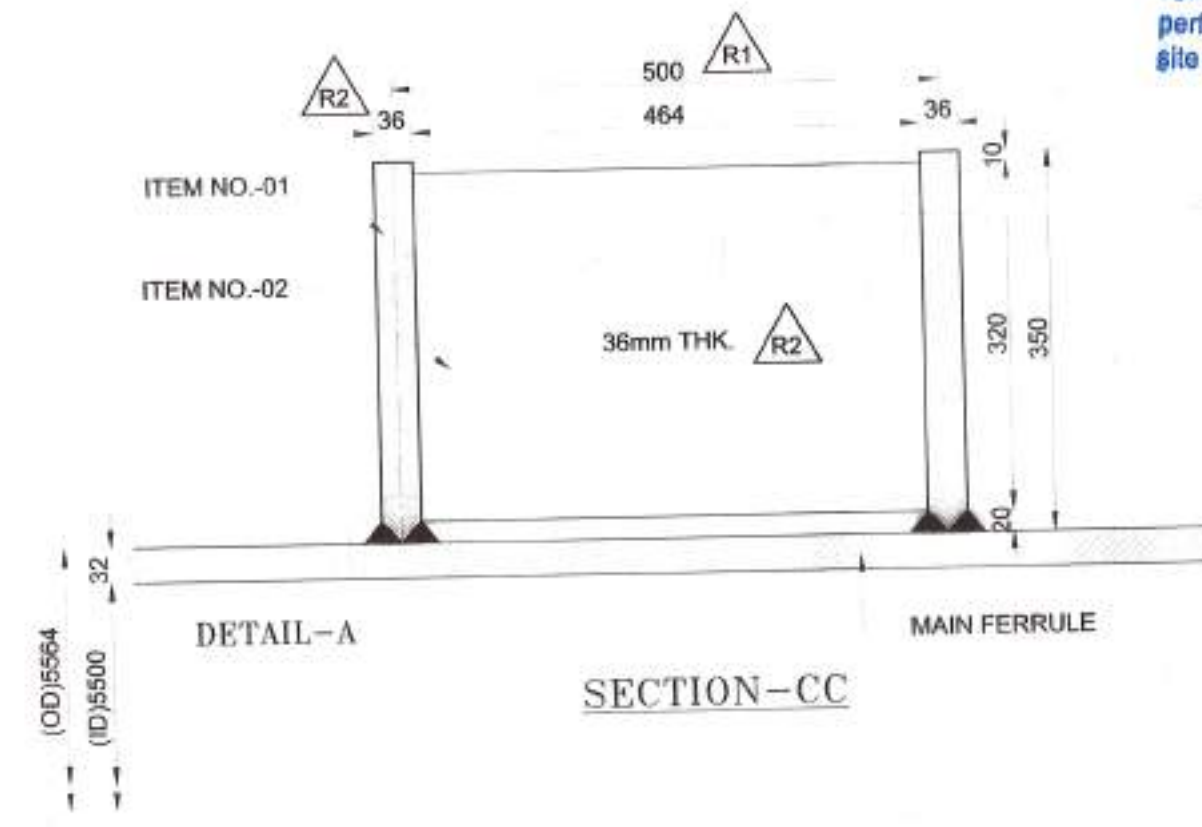
IMPORTANT
N.B. This approval does not relieve manufacturer of any responsibility for accuracy & correctness of Design, Drawings, Fabrication, Erection, Testing, Commissioning, Satisfactory performance of the equipments on the site & guarantee etc.

CHECKED
Asstt./Dy. MANAGER

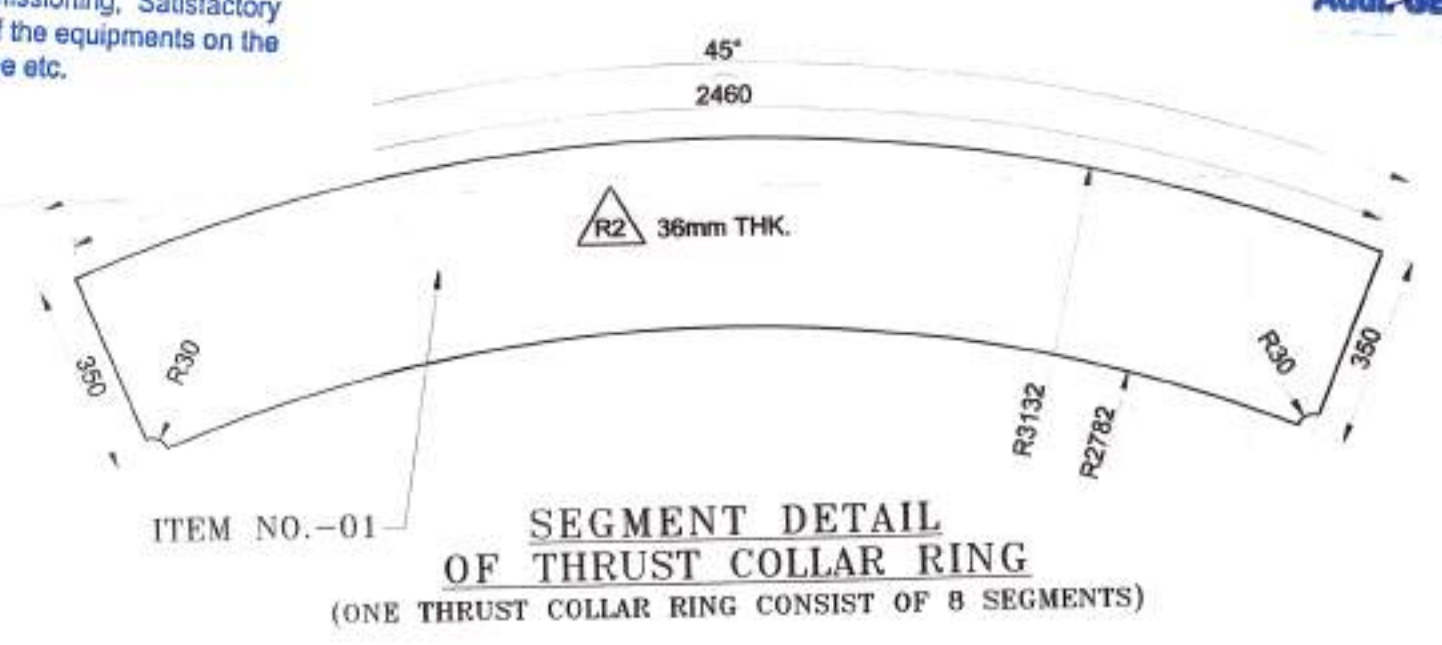
CHECKED
By GENERAL MANAGER

SUBMITTED
Addl. GENERAL MANAGER

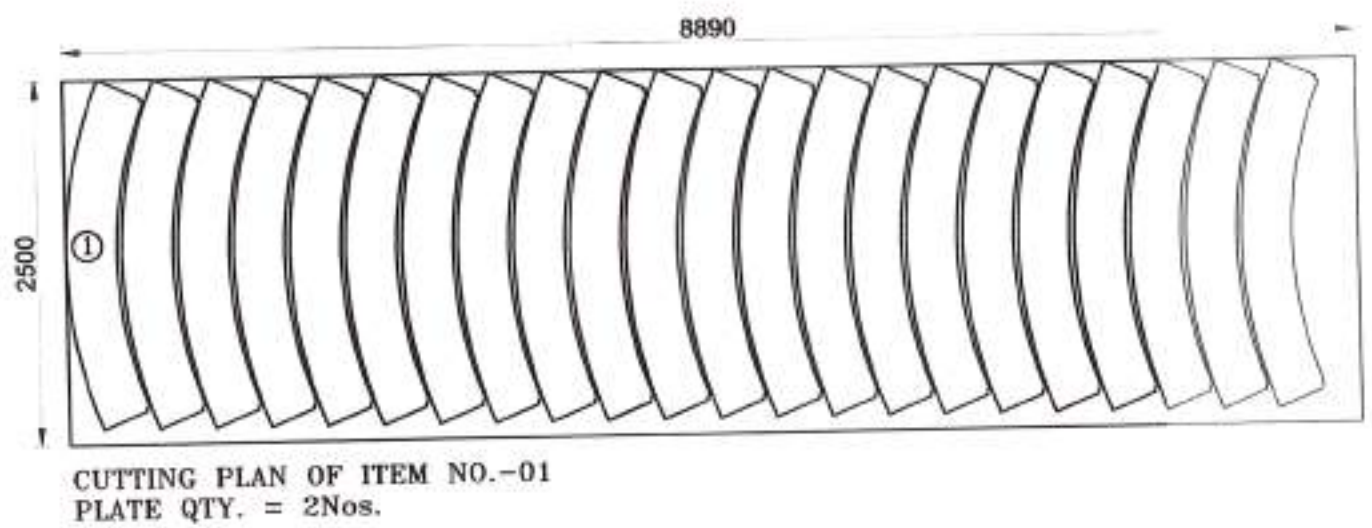
APPROVED
CHIEF GENERAL MANAGER



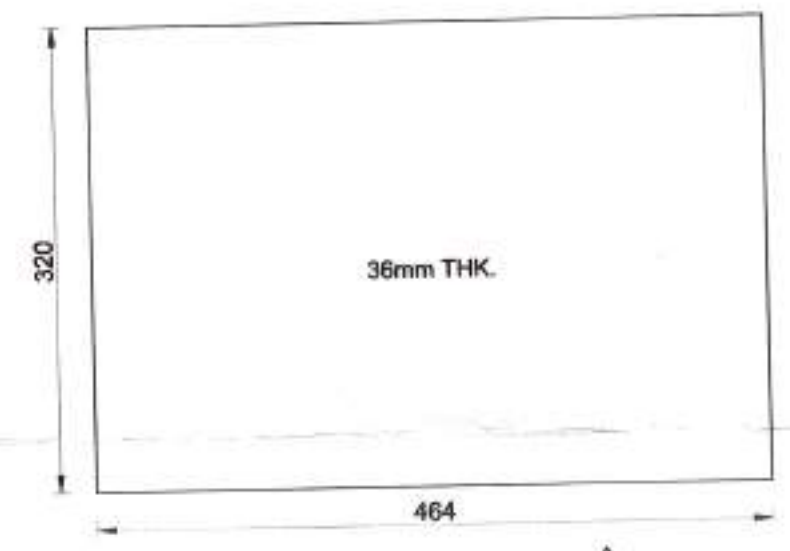
SECTION-CC



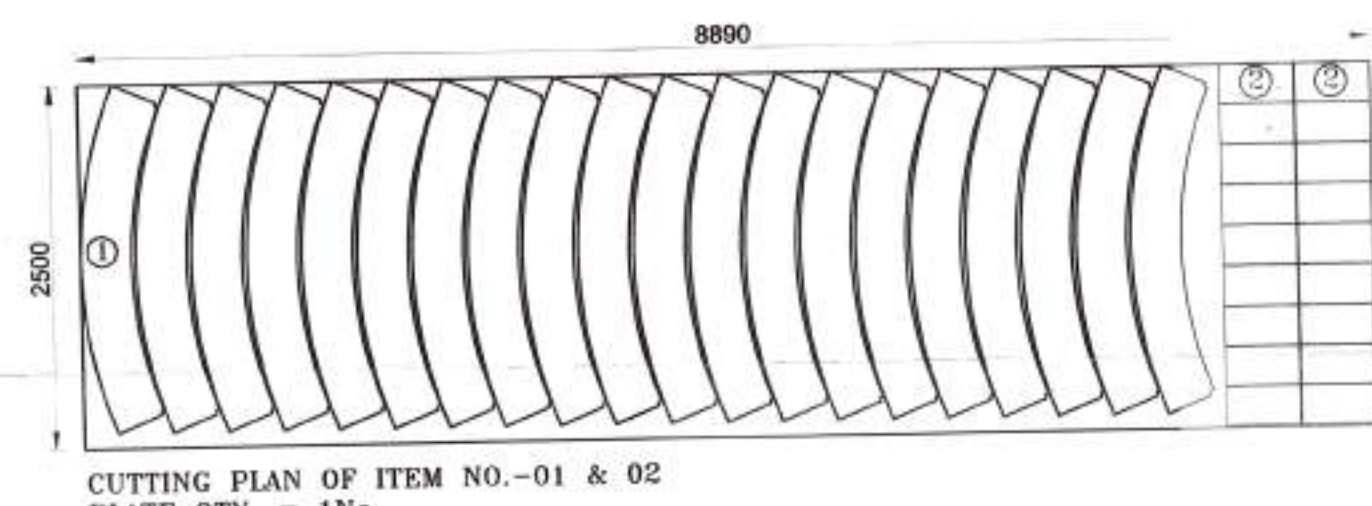
SEGMENT DETAIL OF THRUST COLLAR RING
(ONE THRUST COLLAR RING CONSIST OF 8 SEGMENTS)



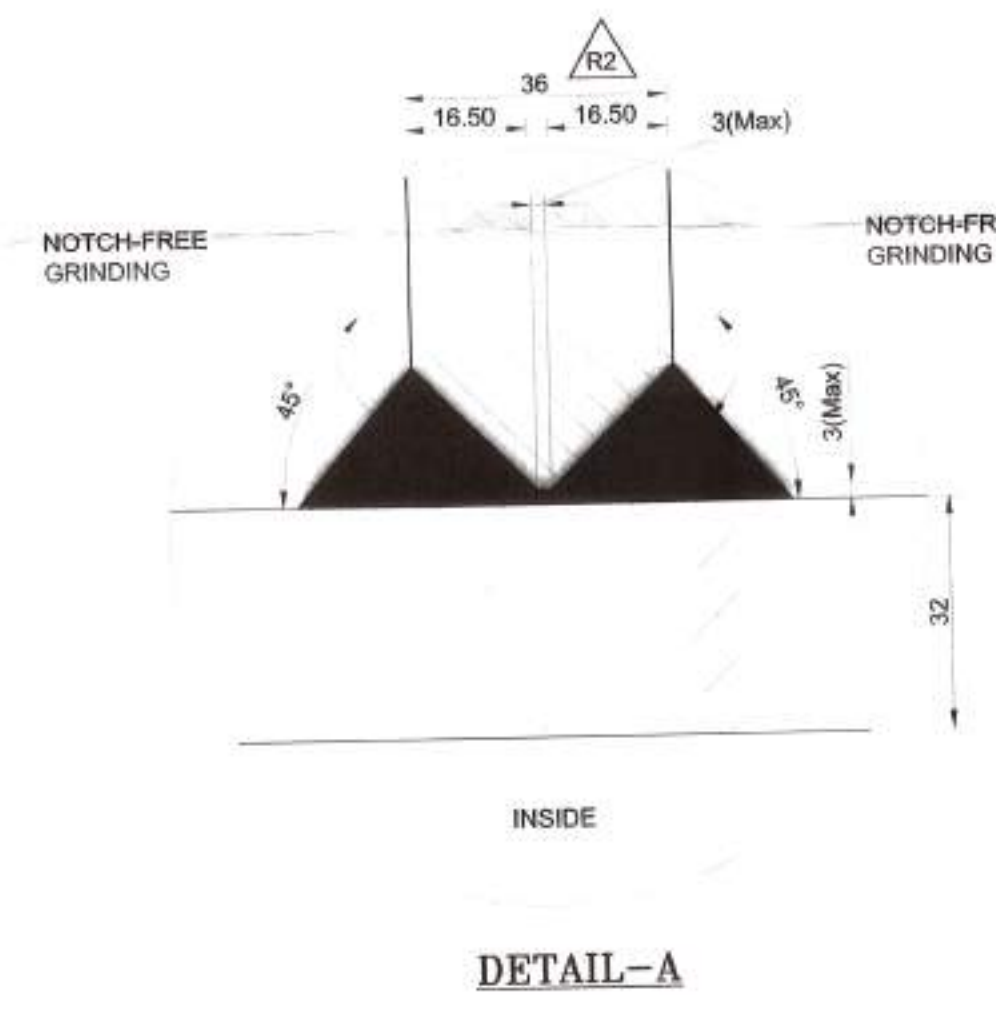
CUTTING PLAN OF ITEM NO.-01
PLATE QTY. = 2Nos.



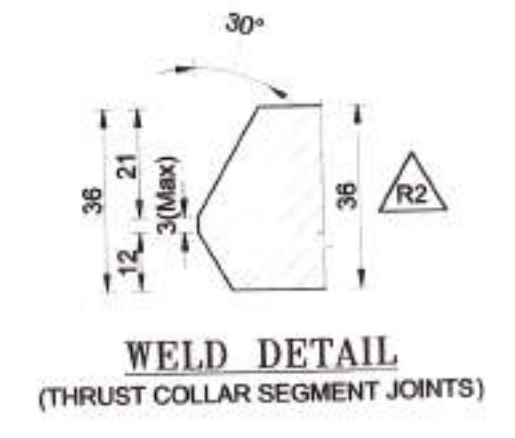
ITEM NO.-02



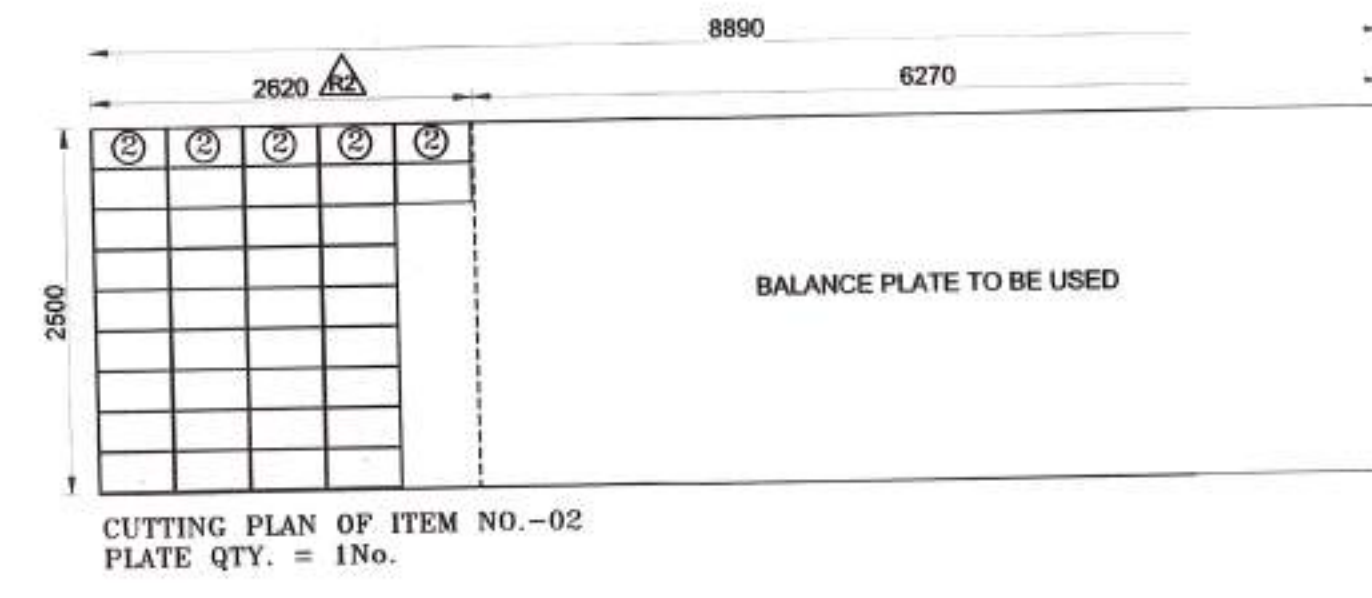
CUTTING PLAN OF ITEM NO.-01 & 02
PLATE QTY. = 1No.



DETAIL-A



WELD DETAIL
(THRUST COLLAR SEGMENT JOINTS)

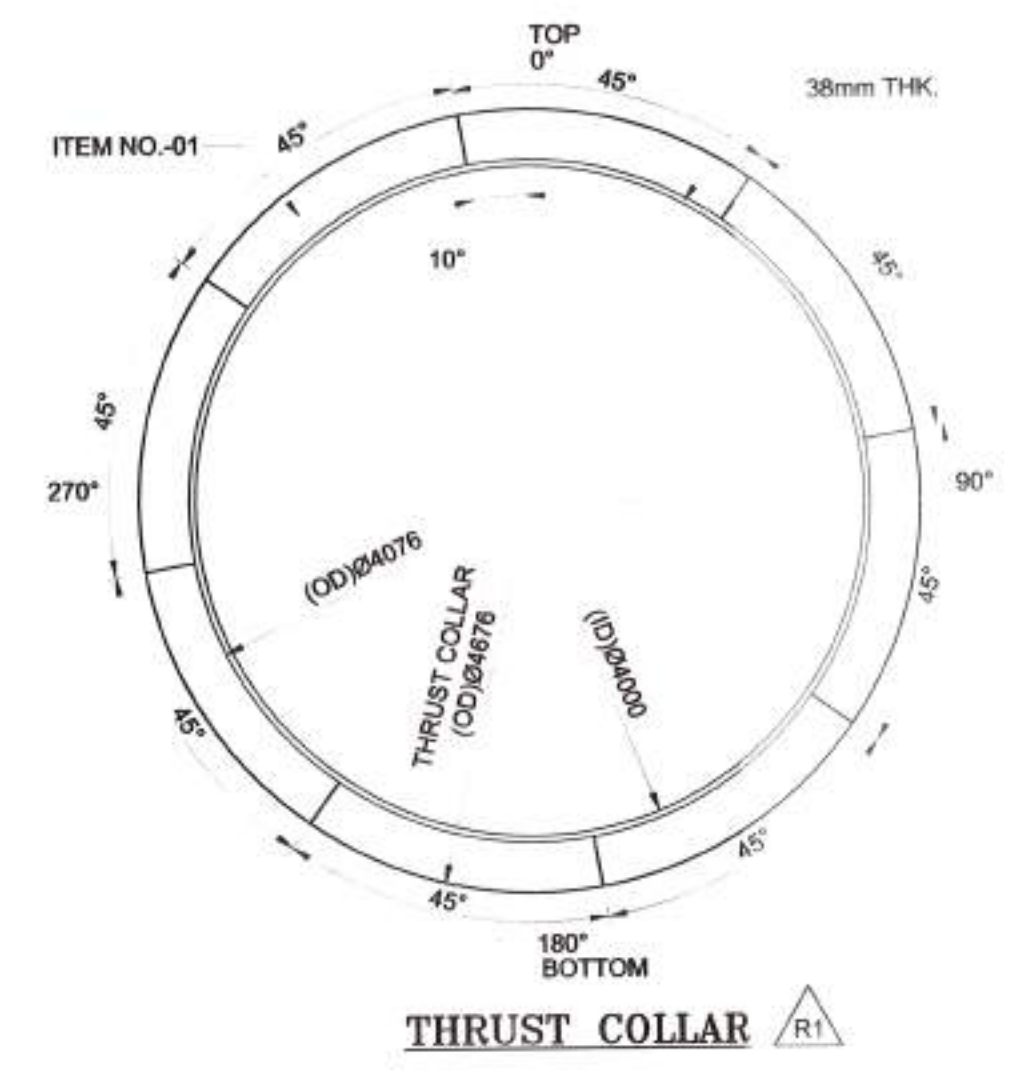
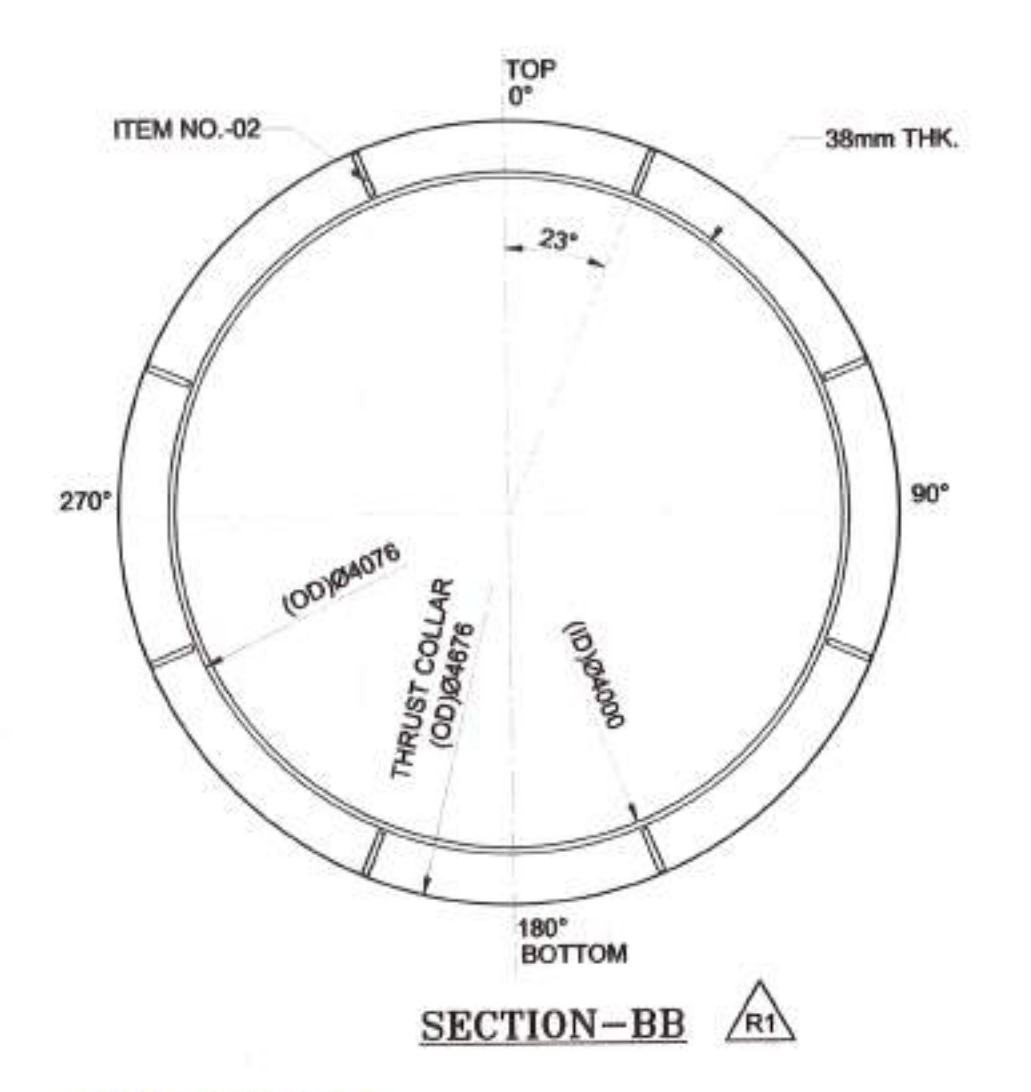
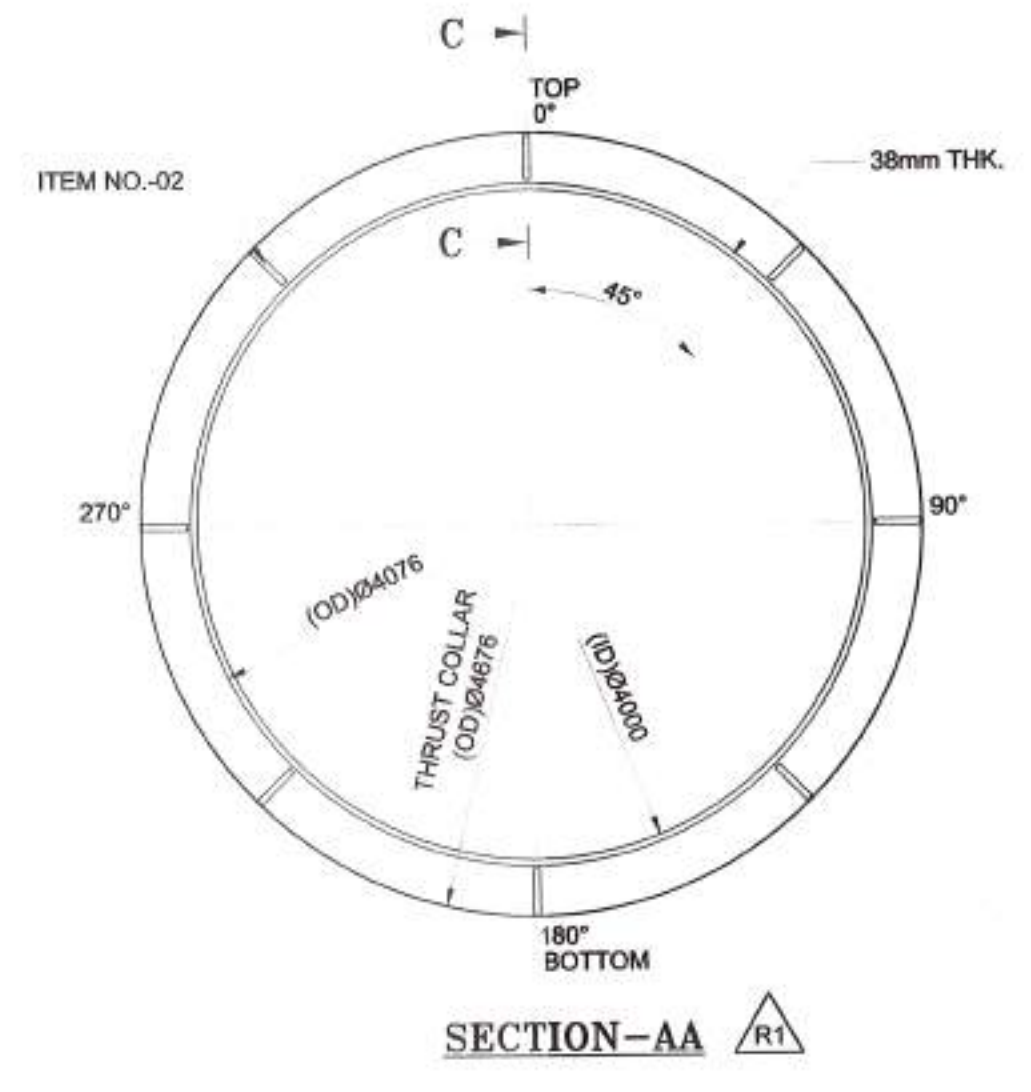
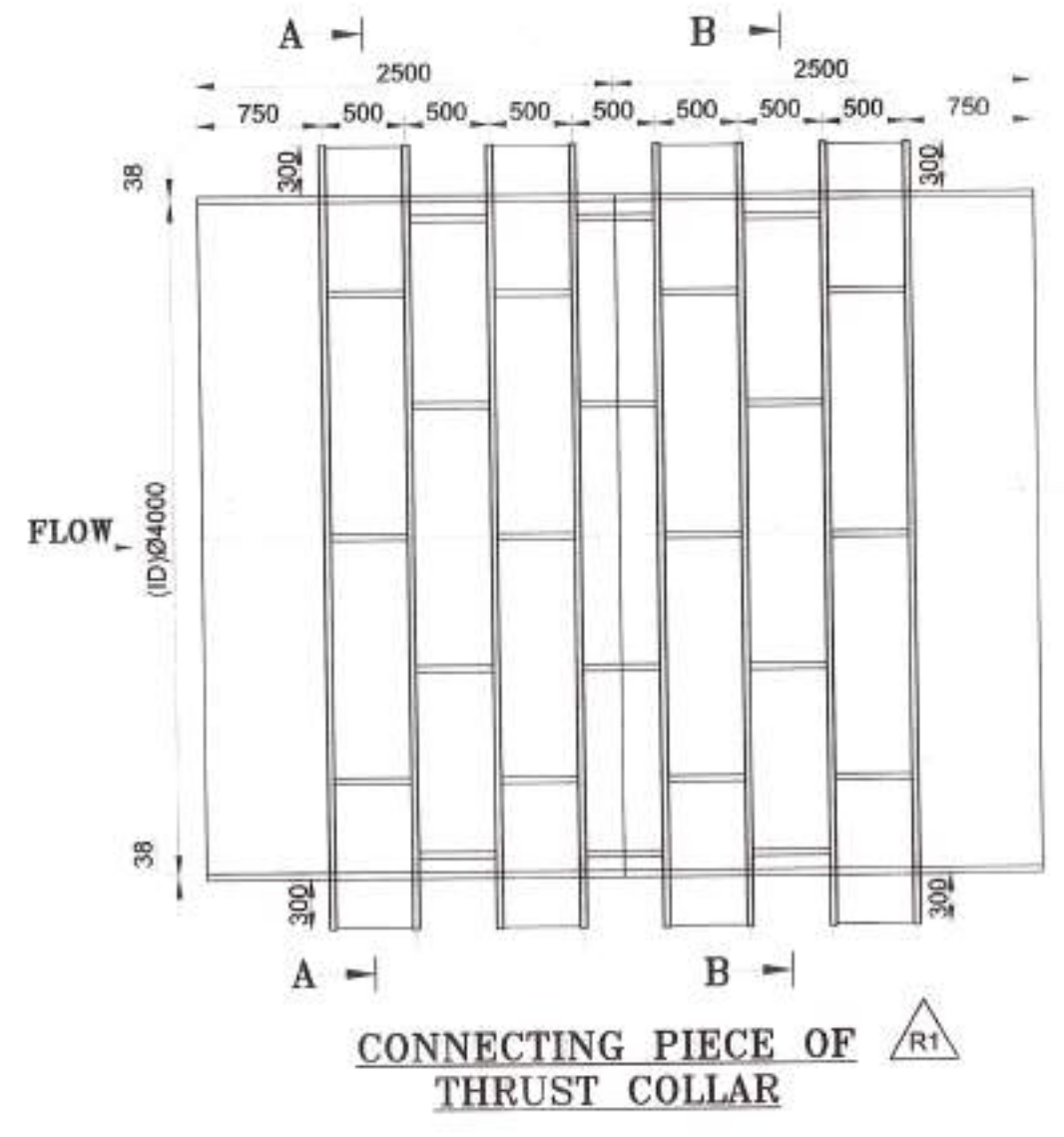
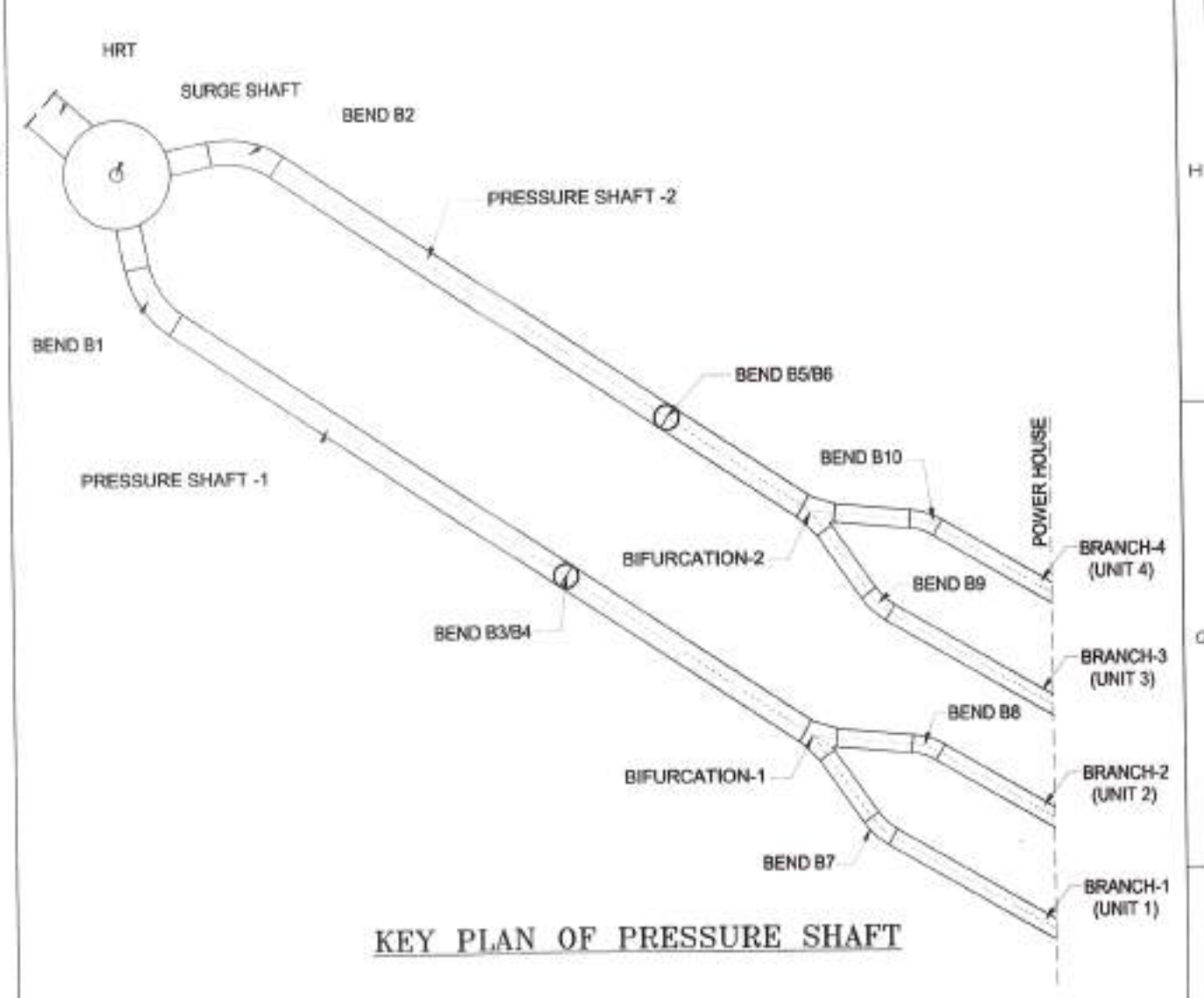


CUTTING PLAN OF ITEM NO.-02
PLATE QTY. = 1No.

R2	REVISED AS PER SAPDC MAIL DATED 13.01.2021
R1	REVISED AS PER SAPDC MAIL DATED 30.09.2020
R0	SUBMITTED VIDE LETTER NO. Arun-III/Nepal/2020/1408, DATED 04.09.2020

SHEET 1 OF 1	
CONSULTANT	SJVN LIMITED
CLIENT	SAPDC (P.) LIMITED
PROJECT	ARUN-III H.E PROJECT
TITLE	GENERAL ARRANGEMENT & DEVELOPMENT OF THRUST COLLAR (OD Ø6264)
DESIGN BY	
DRAWN BY	
CHECKED BY	
DATE OF SUB.	01.02.2021
SIZE	A1 SCALE NTS
DRG NO :	ARUN-III HEP/PSSL/1239 REV-2

4No. THRUST COLLAR TOTAL WEIGHT IN Kgs.	47703.67	60077.62						
1No. THRUST COLLAR TOTAL WEIGHT IN Kgs.	11925.92	15019.41						
2	462X 270 X 38 -Thk.	56	2083.76	2500 X 2360 X 38-Thk.	1	1759.97	ASTM 517 GR.F	THRUST COLLAR
1	Ø4076 X Ø4676 X 38 -Thk.	8	9842.16	2500 X 8890 X 38-Thk.	2	13259.44		
Item No.	Size of Item	Qty.	Erected Weight In Kgs.	Size of plate Used	Qty.	Weight In Kgs.	Material	Ferrule No.



IMPORTANT
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CHECKED Dy GENERAL MANAGER
CHECKED Asst./Dy. MANAGER
SUBMITTED Addl. GENERAL MANAGER
APPROVED CHIEF GENERAL MANAGER

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
 - NO DIMENSION IS TO BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.
 - THIS DRAWING IS PREPARED BASED ON PRESSURE SHAFTS GENERAL LAYOUT PLAN & L-SECTION
DRG.NO. PS-C2-AR3-C01, DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C02, DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C03, DATED: 02 AUGUST, 2019
DRG.NO. PS-C2-AR3-C04, DATED: 02 AUGUST, 2019
 - MARGIN FOR CUTTING ALLOWANCE SHALL BE MADE IN THE DIMENSIONS INDICATED ON THE DRAWING FOR MARKING ON THE PLATE SO AS TO ACHIEVE THE FINAL DIMENSION AFTER CUTTING.
 - FOR BACKFILLING, CONCRETING AND OTHER CIVIL DETAILS REFER CIVIL DRAWINGS.
 - ALL THE PIPE SHELLS, BEND, WYE PIECES, TAPER PIECES, EXPANSION COUPLINGS ETC. SHALL BE GENERAL SUBJECT TO TEST PRESSURE EQUAL TO 150% OF THE DESIGN PRESSURE REDUCING STRESS NOT EXCEEDING 90% OF YIELD STRESS SHELL AND SHALL BE INDICATED IN SEPARATE FABRICATIONS DRAWINGS.
 - WELDING SHALL BE CARRIED OUT AS PER ASME SECTIONS VIII, IS-2825, IS-9595, AND OTHER RELEVANT CODES. ALL WELDS SHALL BE FULL STRENGTH WELDS.
 - MATERIAL OF PENSTOCK HAS BEEN CONSIDERED AS ASTM 537 CL II UP TO EL. 645 & REST ALL ASTM 517 GR F.
 - DESIGN OF PENSTOCK HAS BEEN CARRIED OUT AS PER IS 11639 PART(I),(II),(III) & ASCE MANUAL NO. 79 (2012)
 - ALL INTERIOR AND EXTERIOR SURFACES (UN-MACHINED) SHALL BE 100% SAND BLASTED.
 - NON-DESTRUCTIVE TEST OF WELDS SHALL BE CARRIED OUT AS PER TECHNICAL SPECIFICATIONS.
a) ALL SHOP LONGITUDINAL JOINTS & CIRCUMFERENTIAL JOINTS SHALL BE 100% RADIOGRAPHY.
b) ALL FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECT TO 100% ULTRASONIC TESTING (ACCESSIBLE FIELD CIRCUMFERENTIAL JOINTS SHALL BE SUBJECT TO 100% RADIOGRAPHY).
 - ELECTRODES TO BE USED SHALL BE AS PER THE MATERIAL SPECIFICATION, APPROVED GAP AND APPROVED WPS.
 - THICKNESS OF FILLED WELD FOR STIFFENER SHALL BE SAME AS THE THICKNESS OF STIFFENER.
 - FOR FIELD WELD PROVISION TO BE CHECKED AT OUTSIDE FOR REPAIR FROM OUTSIDE, IF REQUIRED.

- LEGEND:**
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 - OD = OUTER DIAMETER
 - PS = PRESSURE SHAFT
 - THK = THICKNESS
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 - MP = MAKE UP PIECE
 - G.H. = GROUT HOLE
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R2	REVISED AS PER SAPDC MAIL DATED 13.01.2021
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REVISION DETAILS	

SHEET 1 OF 1

CONSULTANT	SJVN LIMITED	
CLIENT	SAPDC (P.) LIMITED	
PROJECT	ARUN-III H.E PROJECT	
TITLE	GENERAL ARRANGEMENT & DEVELOPMENT OF THRUST COLLAR (OD Ø4676)	
DESIGN BY		DATE OF SUB. 01.02.2021
DRAWN BY		
CHECKED BY		
SIZE	A1	SCALE NTS
DRG NO :	ARUN-III HEP/PSSU/1217	REV-2

